



BioUpdate

Department of Biology, Middle Tennessee State University

Spring, 2014



Lynn Boyd

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Message from the Chair

Thank you for your interest in the Biology Department. We are having an exciting year. Our four new faculty members are off to a great start here at MTSU. Dr. Jason Jesson has moved in to his lab in Davis Science Building along with his many fish friends. Dr. Erin McClelland and Dr. David Nelson have also set up their labs in Davis Science Building and are busy teaching and working with students. Dr. Grant Gardner is our newest Biology Education specialist and he has been working with graduate students in the Mathematics and Science Education doctoral program. We are thrilled that all of these fine biologists have chosen to make MTSU their professional home. In addition to the new faculty hires in the department, we have a new research specialist, Dr. Tammy Jessen. You can read more about the new faculty in the first few pages of *BioUpdate*.

However, along with these new hires, we must also report two retirements. Drs. Kurt Blum and Wayne Rosing both retired at the end of the 2013 summer session. Together they contributed 77 years of service to our department. Although we are sad to see them go, we are happy for them as they enter this new and exciting phase of lives. Read about their many contributions on page 6.

There has been much time spent this year planning for our move into the new science building. Drs. Mullen and Jetton have put in an enormous amount of effort to make sure that each piece of equipment has a spot in our new home. Can you believe that our department has 74 refrigerators and freezers? And we plan to buy 17 more to outfit the new building! We also plan to purchase 331 new microscopes for the teaching labs in the new building. Most of our current equipment, along with many new items will also move into the new building.

The new building will bring a new look and feel to the department. No more students sitting on the floor waiting for their classes to start. There will be plenty of seating and hang out areas in our new facility. The labs will be spacious with state-of-the-art teaching technology. The new research labs will allow faculty research programs to flourish. Needless to say, we are very excited about the new science building. One of the many great benefits of the new building is that the whole department will reside in one location. In our current situation, we have faculty offices spread out in 6 different buildings. The new office assignments are listed on page 19 to help you find us!

The department is continuing to provide excellent instruction to our students. Drs. Cahoon and Bailey have been engaged in a course redesign project. In collaboration with faculty involved in several other general education courses, they



Chair's Message

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have set out to test new teaching methodologies in the General Biology sequence. Next year we will analyze the data from the newly designed sections to determine if these new methodologies have enhanced the learning outcomes of the course. Please see next year's *BioUpdate* for a report on this effort.

This has been my second year as chair of the department. I am enormously grateful to our fabulous office staff. The faculty and students have also been a joy to work with. It is important to acknowledge how much our faculty do to make this a great place. Too often the faculty do not get recognized for the good works that they do. Great things lie ahead for this department. 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

New Faculty



Erin McClelland was born in California, but grew up in Hawaii. She received her Bachelor's degree in Marine Biology from the University of California Santa Barbara and her Ph.D. in Biology from the University of Utah in 2003. Her dissertation title was "Pathogen-mediated Mechanisms of MHC Diversity." She held a post-doctoral appointment at the Albert Einstein College of Medicine from 2003 to 2008. Following her post-doctoral position, Erin was hired as a founding faculty member (Assistant Professor of Microbiology and Immunology) at The Commonwealth Medical College, a new medical college in Scranton, PA. For the next four years, she was involved in research, teaching and curriculum development of both medical and Master's level courses. In 2012, her husband, Moses Prabu, obtained a job at a biotech company in Nashville and they relocated to Middle Tennessee. Erin spent last year as an adjunct instructor at MTSU teaching A&P lab before being hired on a tenure-track position in August, 2013.

In her research, Erin investigates gender susceptibility and virulence mechanisms of the pathogenic yeast *Cryptococcus neoformans*. She has numerous publications in journals such as *PLoS One*, *Infection and Immunity*, *Virulence*, *Journal of Clinical Investigations*, *Fungal Genetics and Biology*, *Proceedings of the Royal Society: Biological Sciences*, *BMC Immunology*, and *FEMS Yeast Research*.

Last fall semester, Erin taught the Biotechnology course (BIOL 4550/5550). This spring semester, she is teaching the undergraduate section of Biotechnology (BIOL 4550), as well as a graduate seminar (BIOL 6660).

When she has spare time, Erin likes to do pottery. She says that it helps keep her sane because you cannot think about anything else when throwing a pot. If you do, the pot doesn't turn out so well. She also enjoys hiking, playing tennis, being outdoors, and playing with her cats.

Let us hear from you...

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

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 information. Send contact information and updates to:

Biology Department, MTSU Box 60. Murfreesboro, TN 37132,
Fax: 615-898-5093, E-mail: John.Dubois@mtsu.edu.

New Faculty



Grant Gardner was born in Corpus Christi, TX, but lived in numerous locations while he was growing up. Those many locations included Norton, OH; Pittsburgh, PA; Basking Ridge, NJ; Frankfurt, Germany; and Charlotte, NC. The past 10-plus years were spent in the Raleigh and Greenville North Carolina areas. He received his Bachelor's degree in Biological Sciences from Vanderbilt University in 2000. His Master's and Ph.D. degrees are from North Carolina State University in 2004 and 2009, respectively. The title of Grant's dissertation was "Biotechnology Risks and Benefits: Science Instructor Perspectives and Practices." During the 2009-2010 academic year, he held an interdisciplinary post-doctoral appointment in the Departments of STEM Education and Biology at NCSU.

Grant has a diversity of research interests related to discipline-based education research and research-based instructional strategies in biology. His most recent work has examined the interplay between the instructor and the student as dual actors in the promotion of student learning in the context of large introductory biology courses. From the perspective of the student, projects include work on how student motivation (at the individual and group level) affects student learning in small collaborative groups. From the perspective of the instructor, projects include documenting beliefs, perceptions, and implementation of research-based instructional strategies of a variety of undergraduate instructors including graduate teaching assistants and faculty. He also conducts work on role of emergent technology (such as bio- and nano-technologies) content in school curricula at all levels and how to harness this content to promote interdisciplinary science education, as well as, student learning of socio-scientific issues.

The twenty-plus peer-reviewed publications that Grant has completed are in science education research and practitioner journals, including *International Journal of Science Education*, *Research in Science Education*, *Advances in Physiology Education*, *School Science and Mathematics*, *The American Biology Teacher*, among others. He has presented research annually at the National Association of Research in Science Teaching and National Association of Biology Teachers conferences, and elsewhere. Grant recently had a chapter accepted for the *Cases on Research-Based Teaching Methods in Science Education* book series.

Last fall semester, Grant taught a section of BIOL 1110. This spring semester, he is teaching another section of BIOL 1110, along with MSE 7840 (Special Topics in Math/Science Education). Some of his responsibilities are in helping to grow the Math-Science Education Ph.D. program. During his career, he has also been involved in curricular design and new course implementation for several courses at the undergraduate and graduate level. At Central Carolina Community College, he developed an anatomy and physiology course for pre-dental students. At East Carolina University, he developed an introductory biology course for non-majors who needed a more intense human-centered biology focus than the general education group (exercise sports physiology and pharmaceuticals majors). He has designed and taught graduate-level courses in the social implications of nano-science and post-secondary teaching/research methods in science.

Grant loves spending time with his family (wife Heather, daughter Aylee and son Caden) doing various activities. He fills his "free" time with playing competitive Ultimate Frisbee. He travels to play on a team out of Raleigh, NC (a co-ed team on which his wife plays also). They recently won their NC section and played in the South Regional competition in Alabama. In addition, he was recruited as the faculty advisor to the MTSU Ultimate Frisbee club team. He also enjoys distance running and reading cheesy sci-fi novels.



Students working in the Anatomy & Physiology laboratory



New Faculty



Jason Jessen was born in Cedar Falls, Iowa and grew up in Austin, Minnesota. He received his Bachelor's degree in Biology from Augustana College in Sioux Falls, South Dakota and his Master's degree in Biology and Microbiology from South Dakota State University in Brookings, South Dakota.

In 1999, Jason received his Ph.D. in Biochemistry and Molecular Biology from the Medical College of Georgia in Augusta. His dissertation title was "Artificial Chromosome Transgenesis Reveals Long-distance Regulation of *rag1* Expression in Zebrafish." From 2000 to 2005, he held a post-doctoral appointment in the laboratory of Dr. Lila Solnica-Krezel at Vanderbilt University.

His research studies how planar cell polarity is regulated during complex cell migration events such as the collective movement of embryonic zebrafish gastrula cells. He uses a combination of *in vivo* methodologies in the zebrafish embryo and *in vitro* techniques in human cancer cells to identify underlying molecular mechanisms. His particular interest is in understanding how different components of the planar cell polarity (PCP) signaling pathway interact with other regulators of cell migration including matrix metalloproteinases, integrins, and fibronectin. It is clear that these interactions regulate vertebrate embryonic morphogenesis, but he hypothesizes that their deregulation contributes to tumor progression and metastasis as well. He has published in several journals, including *Developmental Biology*, *Developmental Dynamics*, *Matrix Biology*, *Journal of Cell Science*, *Experimental Cell Research*, *Nature Cell Biology*, *Nature Genetics*, *Proceedings of the National Academy of Science*, and *Cancer Letters*. This past fall semester, Jason taught the undergraduate and graduate courses in Cell and Molecular Biology (BIOL 4210 & BIOL 6390). This spring semester, he is teaching the undergraduate Cell and Molecular Biology (BIOL 4210). Julia Buckley, a Molecular Bioscience PhD student has recently joined Jason's laboratory.

Jason's other interests include dogs, nature and, along with wife, Tammy, working on their 123 acres of land.



David Nelson was born in Liverpool, UK and grew up in Maghull, a small town a few miles north of Liverpool. He received his B.Sc. in Applied Biochemistry from the University of Liverpool. The B.Sc. included one year of working in the pharmaceutical industry at Astra Zeneca in the UK. He received his Ph.D. in 2006 in Biological Sciences and Cell Biology from the University of Liverpool. His dissertation title was "Oscillations in NF-KappaB Signaling Control the Dynamics of Gene Expression." Following his graduate studies, David completed two post-doctoral fellowships. The first was in the Department of Systems Biology at Harvard Medical School from 2006 to 2008. The second was in the Department of Pathology at the University of Cambridge in the UK from 2008 to 2013.

David's research interests are in cell signaling dynamics, neurodegenerative diseases and cancer. During his graduate work at the University of Liverpool, David studied a signal transduction pathway known as 'the NF-kB pathway', a major regulator of the inflammatory process that has been implicated in a range of diseases in man. The pathway can be activated by pro-inflammatory signals arriving from outside the cell (e.g. cytokines such as TNF α) or those produced within (e.g. reactive oxygen species), triggering the relocalization of NF-kB transcription factors from the cytoplasm to the nucleus, where they are able to activate gene transcription. Using single cell imaging techniques to track the movements of NF-kB transcription factors in living cells, he discovered that the pathway didn't simply switch on and off but actually pulsed or oscillated. Like radio waves, these pulses appear to carry information in their frequency and intensity with different patterns corresponding to different transcriptional outcomes (i.e. different genes are activated).

During his post-doctoral research, David studied the PARK family of genes that are associated with early-onset forms of the neurodegenerative disorder, Parkinson's Disease (PD). The etiology of PD is currently uncertain and is multifaceted at best. However, it is likely that inflammation of the brain has a role in the development of the disorder. Inflammation increases in the brain as part of the aging process and can be particularly pronounced in individuals with PD. Recently, several of the PARK genes have been shown to be both regulated by and are

(continued—page 5)

New Faculty



Robert “Drew” Sieg was born in Philadelphia, PA and grew up in several places. Until he was in graduate school, he had never lived in the same place for more than four years. Mostly, he was back and forth between Pennsylvania and Richmond, VA, but also lived in Geneva, Switzerland and London, England for several years.

He received his Bachelor’s degree in Biology from the University of Richmond and, in 2013, received his Ph.D. from the Georgia Institute of Technology. His dissertation title was “Chemically-Mediated Interactions in Salt Marshes: Mechanisms that Plant Communities Use to Deter Closely Associated Herbivores and Pathogens.” Although he considered a few post-doctoral positions, he ultimately decided to jump right into teaching as a professor in the Honors College here at MTSU, as he wanted the chance to try out new approaches to biology and ecology course design.

Drew’s research background is mostly in marine systems. This includes salt marsh chemical defenses produced by plants to deter invertebrate grazers and the fungal “crop” that they grow. He has also studied chemical competition (allelopathy) in near shore phytoplankton communities. In the future, he would like to examine chemical defenses in freshwater systems. There are a lot of unanswered questions in freshwater systems, as terrestrial and marine systems appear to get more of the attention. His publications appear in several different journals, including *Natural Product Reports*, *Marine Ecology Progress Series*, *Journal of Chemical Ecology*, *Journal of Experimental Marine Biology and Ecology*, *Harmful Algae*, along with current articles in review in *Functional Ecology* and *Marine Ecology*.

This past fall semester, Drew taught sections of the honors BIOL 1110 and honors BIOL 1030. This current spring semester, he is teaching a section of honors BIOL 1120 along with a new honors section of the General Ecology course (BIOL 3400). He has an honors seminar course in the works for Fall, 2014 on “Myth and Science” where he will highlight the differences between science, pseudoscience, and superstition throughout the ages. He also hopes this course will explain “supernatural” phenomena from a scientific perspective. In addition, he would like to teach an upper level course on chemical ecology, but as yet, has no near-term plans to so. In terms of style, Drew uses an active learning course design for all of his classes (lots of case studies, journal clubs, debates, and presentations), and is slowly introducing more inquiry-based labs into his courses.

Being recently out of graduate school, Drew’s hobbies and outside interests have had to take a backseat to his studies. However, he is an avid skier and has been doing more biking and hiking since moving to Tennessee. He is also a trivia and movie buff, and has started attending trivia nights at local Murfreesboro spots. Apart from that, Drew has been learning about home renovation and repair as he and his wife Tracey slowly rebuild their kitchen.

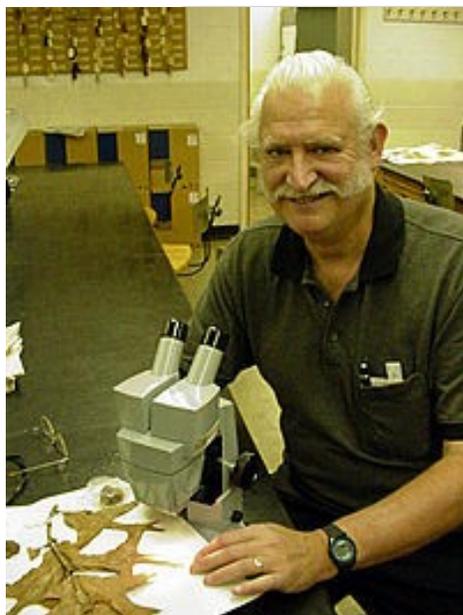
Drew and Tracey recently celebrated their 1-year anniversary by seeing Hugh Laurie in concert in Nashville, as he is an accomplished blues musician in addition to playing Dr. House on TV. Although they have no children as yet, they do have three cats that get in the way nearly as often.

David Nelson (cont.)

regulators of the NF- κ B pathway. As part of his research program at MTSU, he intends to study how pathogenic changes in these genes affects the dynamics of NF- κ B signaling in the brain and use this information to develop novel strategies to combat PD. David’s research has been published in *Science*, *Nature*, *Neuroscience*, *Journal of Biological Chemistry*, *Open Biology*, and other journals.

This semester, David is teaching Cell Metabolism and Human Disease (BIOL 6270). Outside of MTSU, David has a keen interest in photography and enjoys spending time with his wife, Kerrie French-Nelson, and children Imogen (Immy) and Theodore (Theo).

Retired Faculty

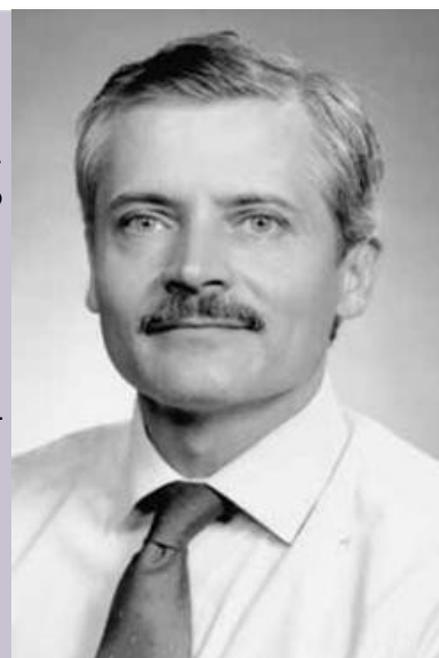


Drs. Kurt Blum and Wayne Rosing retired in the summer of 2013. Dr. Blum joined the MTSU Biology faculty in the fall of 1969 and Dr. Rosing joined the faculty in the fall of 1980.

Dr. Blum earned his A. B. degree from Hanover College (Indiana) in 1961 and subsequently entered Indiana University. After earning his M.A. degree at Indiana, he matriculated at Florida State University where he received his Ph.D. in 1968. During the summer of 1962, while on a west coast excursion, he became the first person to collect and identify the Pacific Yew (*Taxus brevifolia*), a plant now known to be source of an anti-cancer drug, taxol. He chose to conduct his dissertation research in Panama. There, while studying vegetation development in the Pacific lowlands, he met his wife, Rosemarie, now a retired Spanish teacher from Riverdale High School. After a year as a post-doctoral fellow at Vanderbilt University, Blum joined the MTSU biology faculty. During his service at MTSU, he contributed to the department in numerous ways. He guided the master's thesis research of 13 students; he was involved in local programs to popularize botany as an avocation: introduced new courses in taxonomic concepts and dendrology; taught summer courses at the Tech Aqua Biological Station (Center

Hill Reservoir); conducted numerous environmental impact studies and collected plant materials in Central America for the USDA. He was a popular teacher who enjoyed teaching students the importance of keen observation and analytical thinking in scientific work. Dr. Blum's interests span a wide range of topics outside the field of biology. He enjoys reading and talking about political and economic theory and is justifiably proud of his efforts as an inventor and holder of U.S. patents. He enjoys dabbling in real estate, travel, professional entertainment, botanizing in the countryside, and socializing with friends over a meal or a drink. People who know Blum well know him to be a person of few faults and many virtues. According to his longtime colleague, Dr. Charles R. McGhee, Blum is "always in a good mood, frequently insightful, an interesting conversationalist, a great teacher, and a faithful friend." In addition to his wife, Rosemarie, Kurt's family includes a daughter, Connie; a son, Eric, a Murfreesboro realtor; and a grandson, Derek.

Dr. Rosing received his bachelor's degree in botany in 1969 from the University of Wisconsin-Madison. Later that same year, he entered graduate school at the University of Texas-Austin where he studied under the renowned mycologist C. J. Alexopoulos. Rosing recalls several opportunities that presented themselves during his days as a graduate student: the opportunity to serve as a teaching assistant to Harold Bold and Michael Wynne in phycology labs and C. J. Alexopoulos in mycology labs; the opportunity to lecture in "Alex's" classes during absences due to illness; and the opportunity to meet three (of the few) mycologists who have been elected to membership in the National Academy of Sciences - Ralph Waldo Emerson (California-Berkeley), Nathaniel Couch (Georgia), and John Bonner (Princeton). With the Vietnam conflict heating up, another opportunity that presented itself was the chance to serve Uncle Sam through the Reserve Officers' Training Corps! After being commissioned in the U.S. Army Reserves, Rosing rose to the rank of captain before his retirement in 1980 (from a file cabinet!). Despite the disruption of his graduate career by ROTC duties, he managed to win the Harold C. Bold Award for Teaching Excellence and to complete the Ph.D. degree in only six years. In 1976, Rosing joined the faculty at George Peabody College (now a part of Vanderbilt University). At Peabody he taught general botany, drug plants, ecology, microbiology, plant taxonomy, and plants for the home and garden. When Peabody's merger with Vanderbilt was in progress, he began looking for a new academic home and found it at MTSU in 1980. During his time at MTSU, Dr. Rosing enjoyed notable success, rising to the rank of full professor in 1990. His teaching assign-



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MTSU student selected for prestigious Fulbright Award in Brazil

David Owens is on a journey to become an educator who inspires. The Middle Tennessee State University doctoral student clearly remembers the first day he spent outside the U.S. in Quito, Ecuador. “The whole vibe of a new culture and the opportunity to teach and learn in a new place sparked an adrenaline boost that made me feel alive,” he said. Owens is once again experiencing that adrenaline rush while on a nine-month Fulbright English teaching assistantship in Brazil.



character development among the people with whom he has the opportunity to interact. Both programs have taken him across the U.S. and into South Korea, leading participants of all ages on a journey of self-discovery.

Owens said he believes that through high-impact activities — such as whitewater rafting, multiple days of backpacking and outdoor living, and rock climbing — participants develop commu-

The Fulbright Program is the flagship international educational exchange program sponsored by the U.S. government and is designed to increase mutual understanding between the people of the United States and the people of other countries. Recipients of Fulbright grants are selected on the basis of academic or professional achievement, as well as demonstrated leadership potential in their fields.

During his time in Brazil, Owens plans to work with locals on science and farming projects and volunteer where needed. He is participating in some of the local pastimes for which he, too, shares a passion — Brazilian Jiu-jitsu, rock climbing, surfing and playing soccer. His vast wealth of knowledge and experience should serve him well during this endeavor. In 2001, he taught biology in Ecuador and has spent several years since teaching science in high school and university settings. He also spent time in 2011 in India, volunteering at a young men’s home, becoming certified as a yoga instructor and is learning to speak Portuguese.

What truly motivates Owens is sharing knowledge and its usefulness. “My ultimate goal in education is to expand my knowledge and abilities so I can help grow ‘whole’ learners,” he said, “that is, students who walk away from their learning experience with a stronger character as well as an increased knowledge, one which they can apply to help ensure success on whatever path they choose in life.”

Owens’ extensive work orchestrating and leading expeditions with Outward Bound and the Chadwick School’s wilderness program should help him facilitate

nication and leadership skills and find sources of strength from within of which they were previously unaware. He hopes that these tools will help him uncover similar strengths in the people he encounters in Brazil through the Fulbright program.

Owens, a Memphis native, is a student again. He recently began a doctoral program in math and science education at MTSU and served as a Ph.D. Graduate Teaching Assistant in the Biology Department.

“This degree program, coupled with a Fulbright experience, will help prepare me to reach my dream of helping others achieve goals, while expanding my own horizons as an instructor, a traveler, and as an ambassador of goodwill,” he said.

Owens holds a bachelor’s degree in biology education and chemistry from MTSU and a master’s degree in ecology from the University of Nebraska.

This marks the fourth consecutive year MTSU has had at least two students awarded a Fulbright opportunity. Owens is the 11th MTSU student to receive this honor.

For more information on applying for a Fulbright award or other international awards, contact Laura Clippard at 615-898-5464, email her at Laura.Clippard@mtsu.edu or visit www.mtsu.edu/honors/ufo/index.php. She serves as academic adviser and undergraduate fellowships coordinator for the University Honors College.

(Excerpted from an MTSU News and Media Relations Release – Oct. 13, 2013)

The Biology Departments of MTSU and the University of Alabama-Huntsville held a joint symposium September 27-29, 2013 at Tims Ford State Park in Winchester, TN. The objective of the symposium was to foster scientific investigation through presentations, networking and collaborations. MTSU members of the organizing committee were Brian Robertson and Lynn Boyd. Presentations (oral and posters) were made by students and faculty. Below is a list of the oral and poster presentations made by MTSU presenters. MTSU Winning presenters were: Jeannie Stubblefield for oral presentation and Archana Krishnamoorthy for poster presentation. A detailed description, including the complete program, can be found at www.Biosymposium.org.

ORAL PRESENTATIONS

Yohannes T. Mehari, Mary B. Farone. Isolation and phylogenetic characterization of two novel bacteria infecting the nuclei of eukaryotic cells

Chris Davis, Brian Robertson. Development of a Salt Tolerant Luciferase Reporter for Archaea

Ashley Elliott Cole, Elliot Altman. Using missense mutants to test the ability of the Hsp60 and Hsp70 chaperones to rescue misfolded proteins

Hyo (Erin) Park, Ronni Altman, Elliot Altman, Ying Gao, Anthony Farone. Study of Anti-inflammatory Effects of Chinese Medicinal Plant Extracts Screening for new immunomodulator drugs from extracts prepared from plants used in traditional Chinese medicine (TCM)

Jeannie M Stubblefield, Anthony L Newsome. Neglected Tropical Disease Studies at the Tennessee Center for Botanical Medicine Research (TCBMR)

Katherine Sampuda, Lynn Boyd. What Is The Role That Ubiquitin and Proteasome Play During A Stress Response In Oocytes of *C. elegans*?

Nicholas B. Chamberlain, Jerry W. Reagan, Rebecca L. Seipelt-Thiemann. Mechanistic Study of Cyclodextrin's Inhibitory Effect on Lysosomal Acid Sphingomyelinase

Bam Paneru, Fatima Abdouni, Mohamed Salem. Transcriptome reference and digital gene expression atlas of the rainbow trout

Paola A. Molina, Lynn Boyd. The Role Ubiquitin Plays during Elimination of Sperm Organelles from Fertilized *Caenorhabditis elegans* Embryos

Greg Skibinski, Lynn Boyd. Intracellular localization of proteasomes in response to physiological stress and aging in *C. elegans*



POSTER PRESENTATIONS

Laude Bannerman-Akwei, Cindy Hunt, Elliot Altman. A screen for alternative transporters that can facilitate the utilization of the sugar glucose by *Escherichia coli* bacteria.

Ali Ali, Reem Elmusharaf, Fatima Abdouni, Mohamed Salem. Characterization of Rainbow Trout (*Oncorhynchus mykiss*) Spleen Transcriptome and Identification of Immune-Related Genes.

Hyo (Erin) Park, Ronni Altman, Elliot Altman, Ying Gao, Anthony Farone. Study of Anti-inflammatory Effects of Chinese Medicinal Plant Extracts Screening for new immunomodulator drugs from ex-

tracts prepared from plants used in traditional Chinese medicine (TCM)

Jacob Sanders, Lynn Boyd. Identifying the Localization of Ubiquitin within Healthy and Starved Muscle Cells

Archana Krishnamoorthy, Brian Robertson. Development and investigation of dual-color luciferase reporter in *Saccharomyces cerevisiae*

Thilina Fernando, Chris Herlihy, Jeffrey Walck. Roles of local adaptation and pollinator selection in the maintenance of flower color polymorphism in *Leavenworthia stylosa*

Patrick Havlik, J. Brian Robertson. Developing a Biological Hydrogen-Sensing Reporter in Cyanobacteria

Greg Skibinski, Lynn Boyd. Intracellular localization of proteasomes in response to physiological stress and aging in *C. elegans*

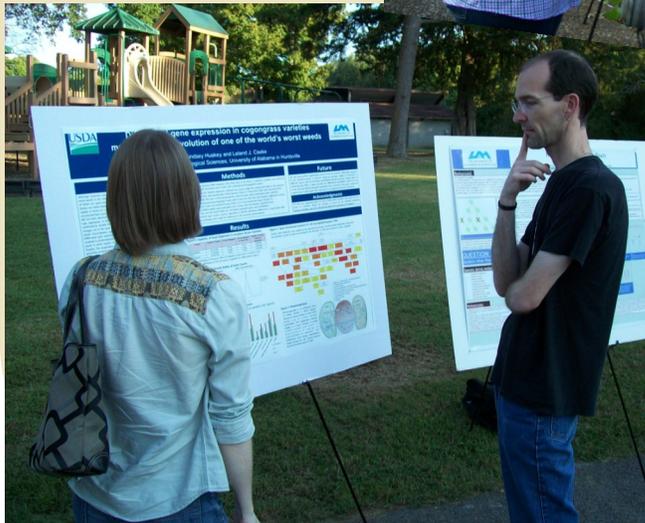
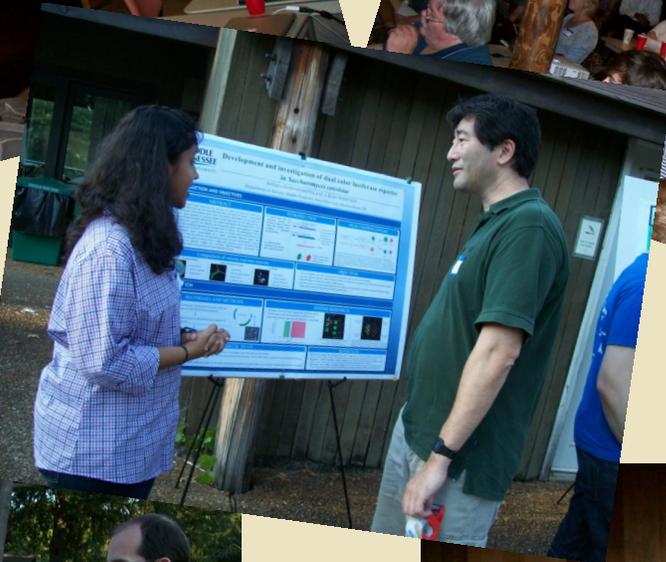
Greg Skibinski, Lynn Boyd. The Role of the Ubiquitin-Proteasome System in the Formation of Polyglutamine Aggregates

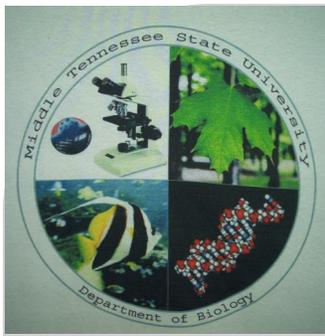
Megan Stallard, Michelle Barbero, Mary Bruce1, Steve Winesett, Alice Layton, Frank Bailey. Differences in seasonal and precipitation trends for two fecal bacterial indicators

Caleb L. Sutton. A Modern Approach to Traditional Chinese Medicine: The Antifungal Saga

Andrew Trivette, Matthew Elrod-Erickson. The role of Ubx2p in ER-resident protein retention

UAH-MTSU Biological Science Joint Symposium





Departmental Logo Shirts and More

The department is selling shirts, backpacks, insulated lunch bags, coffee mugs, and water bottles that sport the departmental logo. The shirts come in five styles: a light tan short-sleeve or long-sleeve T-shirt with the logo on the upper right front and an enlarged color logo on the back; a dark green short-sleeve or long-sleeve polo shirt with the logo on the upper right front; and, a long-sleeve denim shirt with the logo on the upper right front. Several faculty and students have been seen wearing the shirts. The coffee mugs are white with the logo in blue on both sides (logo will be visible regardless if you are right- or left-handed). The stadium cups are 16 oz. blue plastic with a white MTSU Biology logo. The key lanyards are blue ribbed polyester cord with a white MTSU Biology logo.

Come by and check out the Biology Department merchandise in DSB 128. You might even want to add your own personal flare by custom ordering a t-shirt with your favorite color combination. T-shirts can be ordered in short or long sleeves. We also 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:	\$14.00	Drawstring backpack:	\$ 5.00
Polo shirts:	Short-Sleeve:	\$24.00	Coffee Mugs:	\$ 3.00
	Long-Sleeve:	\$28.00	Stadium Cups:	\$ 1.00
Denim shirts:	Long-Sleeve:	\$28.00	Key Lanyards:	\$ 2.00
Heather gray pull-over hoodie:	\$25.00			

(Printed like t-shirts)

All items can be purchased (cash only) in the departmental office from Virginia McKnight (615-898-2291) or by email from Becky Elrod: Becky.Elrod@mtsu.edu.



Featured Faculty Members: Mary & Tony Farone



This year's Featured Faculty for *Bi-oUpdate* are the husband and wife team of Drs. Mary and Tony Farone. The Department of Biology is privileged to have these two distinguished research and teaching members on its faculty. The Farones met while in graduate school, as both were in the Department of Microbiology at Miami University. A friend said that they met "under the microscope!"

Tony was born and grew up in New Castle, PA (north of Pittsburgh)



and graduated from Union Area High School. He received his B.S. degree in Microbiology from Pennsylvania State University in 1984. He completed his M.S. and Ph.D. in Microbiology at Miami University. Tony's dissertation was entitled "Characterization of the Immune Responses During Chemoimmunotherapy of Murine L1210 Leukemia." His NIH Post-Doctoral Fellowship was from 1992 to 1995 at Harvard University. Tony began at MTSU as an Assistant Professor in 1995.

Mary was born and grew up in Edgewood, KY (just south of Cincinnati, OH). She graduated from Notre Dame Academy in Park Hills, KY. In 1986, Mary received her B.A. degree in Biology from nearby Thomas More College in Northern Kentucky. She also completed her M.S. and Ph.D. degrees in Microbiology at Miami University in Oxford, OH. Her dissertation was "The Use of Reovirus Type 3 Protein of Sigma One in the Therapy of Murine EL4 Lymphoma." Mary completed a post-doctoral fellowship at the School of Public Health at Harvard University in 1995. She started her career here at MTSU as an Adjunct Professor in the fall of 1996.

Both have taught extensively in the Department. Mary has instructed Anatomy and Physiology II (BIOL 2020/2021), Microbiology (BIOL 2230/2231), Senior Seminar (BIOL 4200), Immunology Laboratory (BIOL 4300), Diagnostic Microbiology (BIOL 4430), Biotechnology (BIOL 4550/5550), Advanced Immunology Laboratory (BIOL 6380), Clinical and Pathogenic Microbiology (BIOL 6430), Graduate Seminar (BIOL 6650), and Research Ethics (MOBI 7100). Tony has taught Orientation to the Medical Laboratory (BIOL 2000), Microbiology (BIOL 2230/2231), Senior Seminar (BIOL 4200), Cellular and Molecular Biology (BIOL 4210/4211), Immunology (BIOL 4300), Biotechnology (BIOL 4550), Advanced Immunology (BIOL 6380), Advanced Cell and Molecular Biology (BIOL 6390/6391), and Special Topics – Communicating Science (MOBI 7300).

Together, the Farones have been nominated for and received numerous awards while at MTSU. Both have been recognized by students as "Someone Who Made a Difference." In addition, both have received the College of Basic and Applied Sciences award for "Excellence in Presentations." Tony has received the MTSU Million Dollar Grantsmanship Award, the MTSU Research Mentor Award, and the American Society for Virology Award. Mary has received the MTSU Foundation Outstanding Teaching Award, the College of Basic and Applied Sciences award for Excellence in Grantsmanship, and she has also been nominated for the American Society for Microbiology Lectureship Award.

Their combined research program studies host-pathogen interactions. In graduate school at Miami University they investigated how a virus,



Featured Faculty Members (cont.)

called reovirus, could cure and vaccinate mice that were given leukemia.

Mary determined the therapeutic benefit of low dose chemotherapy followed by an individual, recombinant reovirus protein, sigma 1, while Tony characterized the immune response during the combined chemotherapy/virus treatment. During their postdoctoral fellowships at the Harvard School of Public Health, they were both involved with studies on the molecular biology of respiratory inflammation in response to reovirus, bacterial components, and other airborne particles. After coming to MTSU, they continued to work with reovirus in collaboration with researchers at Vanderbilt University Medical Center, and teamed with Legionnaires' Disease researchers at MTSU (Anthony Newsome) and Tennessee Technological University (Sharon Berk) on two EPA-funded research grants. Through this EPA-funded collaboration, they discovered that more Legionella-like intracellular pathogens could

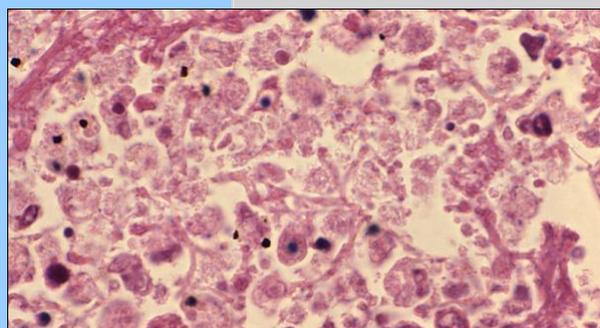


be found in human-made aquatic environments than in natural water systems. They also discovered two very interesting, novel bacteria that grow inside the nuclei of amoeba and macrophages. It was during this time (about 10 years ago) that MTSU began assembling faculty to establish an interdisciplinary science PhD program. To support this effort, they initiated collaborations with Math, Chemistry, and Physics faculty.

With MTSU Synergy grant funding, their group has used molecular modeling to predict enzyme active sites for possible therapeutic intervention of infectious agents that has resulted in



four publications. Mary and Tony each have two doctoral students in what is now the Molecular Biosciences program. As they were studying these interesting enzymes, they received funding from the Department of Homeland Security to study the biodegradation of large animal carcasses that has led to continued Clean Energy funding from MTSU to bioremediate pentobarbital-contaminated soil using recombinant enzymes. They have also published three papers and have ongoing work with MTSU physicist, Dr. Daniel Erenso, in which they characterize the physical properties of individual cells using laser tweezers to assess therapeutic efficacy in different disease states. Over the years, these interdisciplinary studies have provided research experiences for more than 50 undergraduates and graduate students in Biology, Chemistry, and Physics. Two years ago, MTSU began the Tennessee Center for Botanical Medicine and the Farone lab has been assessing the antiinflammatory and antimicrobial activities of phytochemicals isolated from traditional Chinese botanical medicines. Two of their current doctoral students are working on these projects.



Their STEM education interests began as graduate students, when they discovered how much they enjoyed mentoring students. Since coming to MTSU, the Farones have continued mentoring all levels of students from middle school through doctoral students. Together they have graduated 13 M.S. students and currently have 3 M.S. and four Molecular Bioscience Ph.D. students working in their laboratory. For the past 10 years they have also coached the St. Rose Middle School Science Olympiad Team. This team has won the Middle



Featured Faculty Members (cont.)

Tennessee Regional meet for the past 5 years and competed at the State Olympiad, finishing 3rd last year. Currently they lead an interdisciplinary team consisting of science and education faculty from MTSU, including Dr. Kim Sadler of Biology, and the nonprofit BioTN from Middle Tennessee that succeeded in winning one of only two GK-12 awards funded by NSF in 2008. They were awarded \$3,000,000 for their TRIAD STEM Scientist-Training Grant and are currently in the 5th year of funding. The goal of this grant is to train biology and chemistry graduate students to communicate science at all levels, as well as supporting them in their research endeavors. The TRIAD GK-12 program guides 8-10 STEM fellows/year through 1-2 years of training with a partner high school teacher. The fellows mentor high school students through research projects establish connections with local biotech industries, while continuing their own research. The past 4 years have been extremely rewarding for both Mary and Tony, as the program has graduated 3 Ph.D. students that are currently postdoctoral fellows. Ten of the GK-12 M.S. graduates are technicians at local universities or biotech companies. Their STEM Fellows have also made a huge impact in local high school classrooms and several of them now have full-time science teaching positions. The TRIAD GK-12 program not only helps the graduate fellows and partner teachers, but also impacts literally thousands of high school students.

Recently, Tony initiated a collaboration through the TRIAD GK-12 training grant with ecologists at the University of Puerto Rico, a National Academy of Sciences member at the University of Chile School of Medicine, Dr. Jorge Allende, and the Director of the Las Cruces Marine Research Station of the Pontificia Universidad Católica de Chile, Dr. Sergio Navarrete. They will return this year for more research experiences for the fellows, bringing laboratory experiments to high school classrooms, and research presentations at the U.S. Embassy and the Marine Research Station.

The Farones have four children, Grace (current MTSU freshman in Nutrition), Cate, Danny, and Nicky. When not in the classroom or research lab, both Tony and Mary enjoy Girl and Boy Scouting, mentoring Science Olympiad students, and serving as coaches for their children's sporting teams.



Tony Farone, along with graduate students in Chile as part of the NSF-funded TRIAD GK-12 Scientist-Training Grant.

From the MTSU Herbarium

Dr. Ashley Morris became Curator of the MTSU Herbarium in May 2013, upon Dr. Kurt Blum's retirement. Ashley has been actively seeking internal and external funding to support digitization of and curatorial upgrades to the collection. Most recently, she served as a PI on a pending collaborative NSF Collections in Support of Biological Research (CSBR) proposal to fund digitization of all TN-collected herbarium specimens across the state of Tennessee. Ashley is also involved in the larger, southeastern submission to the NSF Advancing Digitization of Biological Collections (ADBC) program, which is due in October.

Additionally, she was invited to attend two, NSF-funded workshops organized by iDigBio, the national hub for the



effort to digitize biological collections. The first workshop was held last August at the University of Kansas in Lawrence. That workshop trained participants in the installation and use of the museum collections database software Specify 6. The second workshop will be held at Florida State University in July, and it will focus specifically on digitization of small herbarium collections.

Over the last year, one PhD student and three Biology undergraduate students have worked in our collection. They have begun the databasing process, and currently have over 7,000 specimens databased. The 'herbarium crew' counted the entire collection this summer, determining that we have more than 22,000 specimens! This is two to three times the number of specimens that had been estimated by other colleagues across the state. With the move to the new science building in 2014, they are beginning to plan collection reorganization efforts, which include deaccessioning specimens with limited label data, developing an institutional exchange program with other collections, and updating the organization of the collection to reflect recent taxonomy based on Angiosperm Phylogeny Group III. The MTSU Herbarium hopes to develop a website to increase public exposure and education about the collection and goals.

NEW NAME! ADDED EMPHASIS! SAME EXCELLENT SERVICE!

By Cindi Smith-Walters

The MTSU Center for Environmental Studies; in the business of creating scientists

The biggest change in the past year at the MTSU Center for Environmental Education (CEE) is the change of name and a modification in focus and service. For the past 35+ years the MTSU CEE's mission has been 'to raise awareness, impart knowledge, teach skills, and to inspire commitment about our environment and its inhabitants, in order that Tennessee citizens will make responsible decisions to conserve and sustain our unique heritage.' To move forward with the University and to augment the new Math and Science Education (MSE) PhD program, the CEE has grown its emphasis by adding a focus on environmental studies and research. The new name of the CEE is now, 'The MTSU Center for Environmental Studies' (CES). The CES is in the business of growing scientists of all ages. It is now more important than ever to have a scientifically literate citizenry that does not rely upon emotion to make environmental and scientific decisions. MTSU wants citizens to be able to think critically and know the science, so informed and educated decisions can be made.

This realization, coupled with the growing emphasis on research in informal education has driven this new emphasis. The long established history of the Center has allowed doctoral candidates access into schools and to agencies for research. This past year, two MTSU doctoral candidates collaborated with a science museum and a state agency to conduct research and assess programming. Both are in the process of publishing their findings. Heather L. Barker, interdisciplinary emphasis PhD candidate examined general science interest and understanding of the nature of science in elementary students attending a week-long day camp at Discovery Center, a children's museum in Murfreesboro, Tennessee. A second candidate, Dave Owens, biology emphasis, continues to work with the Tennessee Department of Environment and Conservation's Division of State Parks. He is evaluating the effectiveness of the Junior Ranger program at state parks and in select elementary schools. This research will continue as the Junior Ranger program expands and is refined using results from his work. Additional MSE students have visited with CES co-directors,

CES cont.

Dr. Smith-Walters and Dr. Kelly. Plans are in place to make research opportunities available and connect these students to interested private organizations and public agencies. Great Outdoors University (GOU) a non-profit group affiliated with the Tennessee Wildlife Federation takes inner city students and introduces them to the out-of-doors through various day trips, camping, and sports. GOU has expressed interest in working with one or more MSE students to assess their programs and add to what is known about non-formal science teaching and learning.

In addition to the new focus on research efforts, the MTSU CES continues to run the Tennessee Amphibian Monitoring Program (TAMP) through a renewed contract



Barking Treefrog *Hyla gratiosa*
(photo courtesy of Bob English)

with TN Wildlife Resources Agency (TWRA). TAMP was featured in a March/April 2013 issue of the Tennessee Conservationist Magazine and spoke specifically about a new Davidson County record of a Pickerel Frog. This species was discovered while TAMP Frog-loggers were running their regular TAMP route and the record was subsequently approved and published in Herpetological Review. A number of new TAMP routes were established this past year and new Frog-loggers trained. All trainees received a copy of the newly released and updated Frogs and Toads of Tennessee CD; a cooperative effort of TWRA and MTSU CES. The CD includes recordings of all species that occur in Tennessee, hypothetical species, a section on similar sounding species, and sound quizzes so that volunteers will be up-to-date and ready for monitoring routes. This CD is also made available to educators statewide, including Tennessee Naturalist Program participants. To aid in running TAMP routes, Frogloggers were each given magnetic TAMP identification plaques to place on sides of their vehicles to identify these volunteers to the general public. This assists volunteers as they gather data and run routes four times a year. Bob English continues his fine work in supervising the TAMP program, training volunteers through workshops, serving as a liaison with TWRA, entering data into a GIS

TAMP database, and providing collected data to NAAMP (North American Amphibian Monitoring Program).

The past two summers the CES has worked with Murfreesboro City Schools and Discovery Center (DC) to conduct environmental based camp days for underserved students in grades four through six. The elementary students were introduced to animal skins and skulls, water quality monitoring, aquatic sampling, predator / prey relationships, and more. Dr. Smith-Walters coordinated with DC staff on site to conduct sessions, while at MTSU, an MSE doctoral candidate and staff from MTSU facilities services led groups. Pre-service teachers from the MTSU College of Education volunteered to work with these youngsters at both locations. A Daily News Journal article was published praising the cooperative efforts of MTSU and DC.

Dr. Smith-Walters a founding member of the Tennessee Naturalist Program (TNP) continues to serve as the treasurer of this organization. The MTSU CES supports TNP by sharing information about the program and encouraging participants, in addition to providing some of the TNP curriculum on forests and forestry. Smith-Walters conducts the forestry 'class' once or twice a year for the Owl's Hill Chapter. This past year Friends of South Cumberland recognized TNP with their 2013 Trails and Trilliums Tribute



Award for The Tennessee Naturalist Program's mission of inspiring the desire to learn and share the nature of Tennessee serves as a spark and when put into the right hands ignites a burning desire in people to give back to nature. Currently there are five chapter locations conducting TNP trainings: at Owls Hill Nature Sanctuary in Brentwood, The Friends of South Cumberland, the

Memphis Botanic Garden, Chattanooga Arboretum-Nature Center, and Ijams Nature Center in Knoxville, with plans for at least three additional chapters. TNP owes its initial development and continued growth to

CES cont.

the guidance and support of Tennessee Parks and Greenways Foundation, Tennessee State Parks, Tennessee Wildlife Resources Agency, Middle Tennessee State University's Center for Environmental Education (now the CES), and Owl's Hill Nature Sanctuary. For more information about TNP go to

<http://tnnaturalist.com/>



This past year the CES was instrumental in working with a number of organizations and agencies both State and non-profit to develop the Tennessee Environmental Literacy Plan for students K-12. The plan was jointly approved by the TN State Departments of Education and Environment & Conservation in 2012. This plan includes recommendations for a new high school graduation requirement, correlations for existing science and social studies standards with environmental education standards provided by the North American Association of Environmental Education (NAAEE), and guidelines for professional development. An environmental literacy plan is an important step to ensure that Tennessee students graduate with an understanding of the complex ecological, social, economic and cultural processes that influence the health of their state and the world at large. An environmentally literate student should

have the knowledge and skills needed to make informed decisions and to become environmental stewards. To access a copy you may go to <http://eeintennessee.org/Files/eetn/2012/TennesseeEnvironmentalLiteracyPlan-4990.pdf>

The cover of the Tennessee Environmental Literacy Plan document features a green and black color scheme. At the top, the title "Tennessee Environmental Literacy Plan" is written in white. Below the title is a photograph of a young boy in a red shirt looking at a plant. The text "Explore, Learn, Engage" is written in white on a black background. At the bottom, there is a quote and the date "July 23, 2012".

Tennessee Environmental Literacy Plan

Explore, Learn, Engage

Accepted by
Tennessee Department of Environment and Conservation
and
Tennessee Department of Education
July 23, 2012

"A person is environmentally literate when they have the knowledge of environmental processes and issues needed to make informed decisions and participate in civic affairs."
-National EL and Training Foundation and EL Council

The CES is also working with the Cumberland River Compact consulting on a new educational booklet designed for upper elementary students and teachers entitled, *Life Support: Tennessee's Water*. The goal of the project is to enhance understanding of all facets of water conservation. There will be a print release with plans for electronic accessibility at a later date. Publication is targeted for 2014.

This past year Dr. Kelly continued on a limited basis to share school programs as time allowed, presented at State and National conferences; one of which was the National Marine Educators Association's annual conference in Mobile, Alabama. Dr. Smith-Walters continues to serve on several State and National boards and committees including, but not limited to, the Tennessee Academy of Science, Tennessee Environmental Education Association, as a Governor's appointee of the Keep Tennessee Beautiful Committee. Additional duties have included science fair judging, presenting at several State and regional conferences, conducting programs for formal and informal groups, such as classrooms and scouts, and serving on the editorial boards of journals. National Project Learning Tree invited her to serve on their 'Next Generation' update board as a writer and editor. She also remains in close association with State forestry, wildlife, and parks agencies and was the lead facilitator for the Project WILD / Project Learning Tree Facilitator Training held at Montgomery Bell State Park during spring break of this year. Dr. Kim Cleary Sadler remains the contact person for the Center for Cedar Glades Study and for the microscope loan program out of the CES. This program, established by Dr. Sadler, has been able to provide loans of refurbished microscopes to a number of schools and classrooms in Tennessee. In addition to this work Dr. Sadler is involved in local schools, school gardens, and mentoring Master's degree students.

Microscopes as well as other loaner resources (tree trunk, bat box, bird box, green shopping cart, etc.) continue to be available to both formal and non-formal educators through the CES. This 'lending library' is not just limited to these materials. The CES serves as a distribution site for many resources available from State agencies. If you are interested in becoming involved with the CES or if you have questions, we welcome you to contact us through Dr. Smith-Walters cindi.smith-walters@mtsu.edu 615-848-0327 or Dr. Padgett Kelly J.Kelly@mtsu.edu 615-898-5615.

From the lab of Andy Brower

Ivonne Garzón-Orduña, a recent Ph.D. from the lab of Carla Penz and Phil deVries at University of New Orleans, joined the Brower laboratory as a Postdoctoral Associate in March 2013. Ivonne will assist with work on their NSF-funded project on timing and diversification patterns of Amazonian butterflies.



Jess Matz, M.S. student, successfully defended her master's thesis in October 2013. Her thesis topic is the systematics of south-temperate pronophiline butterflies.

Dr. Brower gave a plenary talk at an international symposium at the Linnean Society in London in November 2013. The symposium was in honor of the 100th anniversary of the birth of Willi Hennig, a German biologist who is considered the founder of phylogenetic systematics, also known as cladistics.

From the lab of John DuBois



Graduate student, Misty Griffith, is continuing her research on isolating Atrazine-degrading bacteria. To date, she has found a few candidates that show promise. Her research has also involved the help of Dr. Mary Farone in assessing the degradation of Atrazine in culture.

Beginning in the fall of 2013, John began teaching Honors sections of the General Biology course (BIOL 1110). He has replaced Dr. Wayne Rosing in this capacity, following Rosing's retirement in 2013. This spring semester, John is co-instructing the Wine Appreciation course (ABAS 2500) with Dr. Tony Johnston in the Agribusiness/AgriScience Division. Over the spring break he took several students from the class to Canada to visit various wineries and Niagara College, which has a teaching winery and a teaching brewery. They visited large commercial wineries/vineyards and small family-operated wineries. Students learned the entire process from vine to bottling and sale.

From the lab of Matt Klukowski

The Klukowski lab has been focusing its efforts on the study of testosterone and the stress hormone corticosterone in reptiles. Recent projects have involved examining the interactions between color, testosterone, and leukocytes in skinks, and testing for seasonal changes in box turtle hormones and leukocytes. Members of the Klukowski lab travelled with the Bailey lab to Lake Erie, Ohio last summer for a project testing for sex differences in stress hormones and immunity in water snakes.



Recent Publications:

Seddon, R.J., and M. Klukowski. 2013. Secondary sexual coloration is related to white blood cell counts and testosterone in male southeastern five-lined skinks (*Plestiodon inexpectatus*). *Amphibia-Reptilia* 34: 585-589.

Former Students:

Julie B. Phillips (M.S. '06) was recently awarded the Carol Tomlinson Keasey Leadership Award, as well as, the Outstanding Graduate Teaching Assistant Award from the University of California, Merced. Julie is set to graduate in December with a Ph.D. in Quantitative and Systems Biology. The working title for her dissertation is "Evolution of Eukaryotic tRNA." Julie is currently living with her family in New Mexico where her husband Josh is doing a post-doc at Los Alamos National Laboratory.

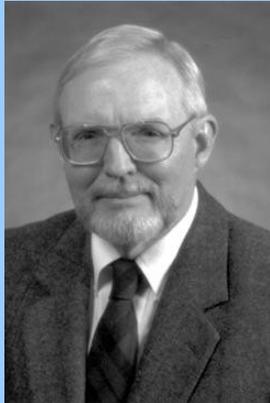
Kyle L. Sykes (M.S.'08) is teaching biology at Independence High School in the Thompson's Station community just south of Franklin, TN.

Ryan J. Seddon (M.S.'11) is in his first year of a Ph.D. program at Indiana State University. Ryan's dissertation project involves understanding the function and mechanism of increased melanization of lizards at higher altitudes. Ryan's Ph.D. advisor is Diana Hews.

Again last summer, John was active in advising freshman students in the summer CUSTOMS along with Dr. John Zamora. In addition, he advised several transfer students who will be majoring in biology at MTSU.

From the lab of Charles McGhee

During the fall 2013 semester, Dr. McGhee supervised 16 student field problems in Entomology. In addition, he has been serving as Chair of the Fellows Committee of the Tennessee Academy of Science.



Recent Presentations:

“What's in a name ? Phalangid nomenclature with emphasis on genus *Leiobunum* (Arachnida: Phalangida (Opiliones).” Tennessee Academy of Science meeting, Motlow State Community College, November,

Jeff was awarded a Visiting Professorship for International Scientists and spent mid-May to mid-July living near the Beijing Botanical Garden and working in the Institute of Botany at the Chinese Academy of Sciences. While there, he conducted research on the responses of seed germination and seedling growth of dominant plants to climate change in Mu Us Sandland of central Inner Mongolia. Jeff and his family also attended the 4th International Meeting on Seeds and the Environment (in Shenyang, China) and toured the eastern portion of Inner Mongolia. This past year, Jeff was an invited speaker at a Forum on Collaborative Agriculture Education (Hokkaido University, Japan), a symposium for the 5th World Congress on Ecological Restoration (Madison, WI), and at the International Symposium on the Roles of the Arboretum and Botanical Garden against Climate Change in East Asia (South Korea).

From the lab of Jeffrey Walck



The big news out of the lab for this year was that Siti was awarded a Fulbright Scholarship. She will spend February to June 2014 in Indonesia conducting research on several members of the genus *Rafflesia*. This group of plants is parasitic and endemic to tropical Southeast Asia. One species, which she will study, produces the world's largest flower (1 m in diameter) and is confined to Indonesia. More on the outcomes of this adventure in next year's BioUpdate.



Jeff, Edwin and Siti visiting the grasslands of eastern Inner Mongolia, China.



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Like us on Facebook and follow us on Twitter. On Facebook, search **MTSUBiology**. When on Twitter, search **@mtsu_bio**. Keep up with the Department of Biology on social media. While there, tell us what you have been doing.



Office Locations in the New Science Building

Biology Department Office

2044

David Powell 2139
 Joyce Miller 1028
 Karen LeHocky 1088
 Altman, Eliot 2065
 Bailey, Frank 2026
 Benz, George 1055
 Bergemann, Sarah 1081
 Boyd, Lynn 2044
 Brower, Andy 1051
 Butler, William 2135
 Cahoon, Bruce 1069
 Cobb, Vince 1083
 DuBois, John 2022
 Elrod-Erickson, Matt 2028
 Ervin, Gore 2151

Farone, Mary 2085
 Farone, Tony 2083
 Gao, Iris 2067
 Gardner, Grant 2149
 Herlihy, Chris 1059
 Howard, Steve 1053
 Jessen, Jason 2014
 Jetton, Amy 2153
 Johnson, Sandra 2123
 Kelly, Padgett 1147
 Klukowski, Matt 1151
 Leblond, Jeff 2051
 McClelland, Erin 2121
 McGhee, Charles 2141
 Miller, Brian 1071

Morris, Ashley 1067
 Mullen, Dennis 1085
 Nelson, David 2016
 Newsome, Anthony 2069
 Otter, Ryan 2024
 Robertson, Brian 2053
 Rutledge, Michael 1149
 Sadler, Kim 1161
 Salem, Moh 2055
 Seipelt, Becky 2012
 Smith-Walters, Cindi 1163
 Stewart, Bill 2010
 Walck, Jeffrey 1057
 Wright, Steve 2081
 Zamora, John 2155





Tennessee Academy of Science

Providing a Forum for Science Education and Research in Tennessee since 1912

TAS holds 123rd Annual Meeting

The 123rd annual meeting of the Tennessee Academy of Science was held November 15, 2013 on the campus of Motlow State Community College, Lynchburg, Tennessee. The Biology Department showed an unusually low number of student and faculty papers (3 oral presentations and 3 posters) again this year. However, the Department continues its strong support of the Academy with a number of faculty members serving as officers, committee chairs, and committee membership.

The plenary lecture, entitled "Giant Trees at the Ancient South Pole and Giant Worms on the Modern Seafloor: Antarctica's Clues to Earth Processes and Change" was presented by Dr. Molly Miller, Vanderbilt University. Drs. Gore Ervin and Cindi Smith Walters served on the Nominating Committee, Dr. Cindi Smith-Walters Chaired the Education Committee, and Dr. Charles McGhee chaired the Fellows Committee. Dr. Kim Cleary Sadler is this President-Elect.

The 124th Annual Meeting of the Tennessee Academy of Science will be November 21, 2014 at Walters State Community College in Morristown, Tennessee. Papers and posters presented at the 2013 meeting are listed below with student authors or coauthors designated with an asterisk (*).

Papers Presented

Charles R. McGhee, "What's in a Name? Phalangid Nomenclature with Emphasis on Genus *Leiobunum* (Arachnida: Phalangida (Opiliones))."

Heather L. Barker* and Cindi Smith-Walters, "Effect of a Content-Based Science Biology Course on the Attitudes of Pre-service Teachers Toward Teaching and Learning Science."

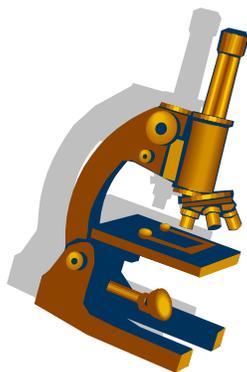
Jeffery W. Bonner* and Michael L. Rutledge, "Understanding the Effect of an Active Learning Strategy in a Non-major Biology Course."

Posters Presented

Lauren E. Whaley*, Megan L. House, Matthew E. Wright, and Stephen M. Wright, "Evaluation of Selected Plant Extracts for Anti-herpes Simplex Virus-1 Activity."

Kim Cleary Sadler, Jennifer Parrish*, and Katlin O'Connor*, "Getting the Dirt on Composting and Elementary Student Perception about the Process of Science."

Zena A. Tenenbaum* and Kim Cleary Sadler, "A Qualitative Study of the Citizen Science Youth Internship Program at the Great Smoky Mountains Institute at Tremont."



Theses Completed (2013):

The Biology Department graduated 11 students with the Master of Science degree in Biology during the May, August and December 2013 ceremonies. As of the December, 2013 ceremony, the Biology Department has produced 348 master's theses. Nationwide, Middle Tennessee State University is a leader in producing master's level graduates. Students, their graduation year, thesis titles, and faculty advisors are recognized below. A complete list of all theses completed to-date in the Biology Department can be found at <http://capone.mtsu.edu/jddubois/3230/theses.html> or on the Biology Community section of D2L.

Campbell, Joshua R. 2013. Demography, Topographic Orientation, and Migratory Patterns of Two Ambystomatid Communities on the Southern Cumberland Plateau in Franklin County, Tennessee. (Brian Miller, Advisor)

Floyd, Michael R. 2013. High Throughput Screening of Extracts From Plants Used in Traditional Chinese Medicine Against *Trypanosoma brucei brucei* 427. (Anthony Newsome, Advisor)

Grimes, Benjamin T. 2013. Characterization of Open Reading Frames in the Tobacco Mitochondrial Transcriptome. (Bruce Cahoon, Advisor)

Hollis, Paul R. 2013. A Differentiation Therapy for the N2a Neuroblastoma Through the Cholesterol Synthesis Pathway. (William Stewart, Advisor)

House, Megan. 2013. Evaluation of Extracts Used in Traditional Chinese Medicine for Antiviral Potential Against Herpes Simplex Virus Type 1. (Stephen Wright, Advisor)

Keating, Cody E. 2013. Differentiation Paradigms and STAT Protein Expression in Neuro-2A Cells. (William Stewart, Advisor)

Kluting, Kerri L. 2013. A Revised Generic Classification for the Rhodocybe-Clitopilus Clade (Entolomataceae, Agaricales) Including the Description of a New Genus, *Clitocella* GEN. NOV. (Sarah Bergemann, Advisor)

Lee, Justin W. 2013. A Comparison of Three Types of Compost Materials for the Reduction of Bacterial Pathogens. (Mary Farone, Advisor)

Matz, Jess. 2013. The South Temperate Pronophilina (Lepidoptera: Nymphalidae: Satyrinae): Revisionary Notes and a First Phylogenetic Hypothesis. (Andrew Brower, Advisor)

Saul, Tiffany B. 2013. A Model for Sex Estimation of Human Skeletal Remains Utilizing Tooth and Spacing Metrics from Canines and First Molars. (Amy Jetton, Advisor)

Tenenbaum, Zena A. 2013. A Qualitative Study of the Great Smoky Mountains Institute at Tremont's Citizen Science Youth Internship Program. (Kim Cleary Sadler, Advisor)

BioUpdate

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Produced by MTSU
Department of Biology

Key contributors to this issue of *BioUpdate* are Lynn Boyd, Mary & Tony Farone, Philip Mathis, Virginia McKnight, Brian Robertson, Cindi Smith-Walters

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Graduate Teaching Assistants for 2013-2014

For the 2013-2014 academic year, the department is providing support to 27 M.S. level and 22 Ph.D. level graduate students who serve as Graduate Teaching Assistants (GTA). Thirty of these students have received undergraduate degrees from colleges and universities other than MTSU. Twenty two of this year's assistants hold baccalaureate degrees in subjects other than biology (anthropology, biochemistry, biotechnology, botany, chemistry, community and public health, environmental science, mathematics and science studies, medical technology, microbiology, plant and soil science, psychology, wildlife and fishery science, and zoology). Five of these assistants have received baccalaureate or master's degrees from universities outside the United States. All have the requisite training in biology to serve as departmental teaching assistants. Without these GTAs, the department would be unable to offer the numerous sections of the non-majors biology course (BIOL 1030) and the majors freshman courses (BIOL 1110/1120), along with some sophomore and junior level laboratories. The Department is very pleased to have them with us.

MASTERS GRADUATE TEACHING ASSISTANTS

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

Laude Bannerman-Akwei, B.S, Chemistry, 2004, University of Cape Coast; M.S.
Chemistry East Tennessee State University

Sarah Barns, B.S., 2010, Biology, Old Dominion University

Alison Carey, B.S., 2010, Biology, Middle Tennessee State University

Griffin Cummings, B.S., 2011, Biology, Middle Tennessee State University

Tiffany Goodman, B.S., 2010, Biology, Middle Tennessee State University

Suzanne Hicks, B.S., 2009, Biology/Psychology, Middle Tennessee State University

Alyssa Hoekstra, B.S., 2008, Zoology, Auburn University

Brian Houck, B.S., 2012, Wildlife and Fisheries Science, Tennessee Tech University

Cindy Hunt, B.S., 1989, Chemistry, Lipscomb University; M.S., 1995, Chemistry-
Biochemistry, University of Connecticut

Alison Jordan, B.S., 2005, Anthropology, Middle Tennessee State University

Sarah Kirkpatrick, B.S., 2007, Biology, Mississippi State University

Deborah Knott, B.S., 1991, Botany, Brigham Young University

Archana Krishnamoorthy, B.S., 2012, Biotechnology, PES Institute of Technology

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

Eric Nordberg, B.S., 2010, Wildlife and Fishery Science, Pennsylvania State University

Katlin O'Connor, B.S., 2012, Plant and Soil Science, Middle Tennessee State University

Andrew Oshodi, B.S., 2007, Zoology, University of Benin (Nigeria)

Herschell Parker, B.S., 1973, Psychology, Belmont University

Haley Pimental, B.S., 2012, Chemistry, Middle Tennessee State University

Patricia Ritchey, B.S., 2011, Biology, Middle Tennessee State University

Jacob Sanders, B.S., 2012, Biology, Tennessee State University

Katherine Stefanski, B.S., 2009, Biology, University of North Carolina-Chapel Hill



Graduate Teaching Assistants for 2013-2014

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

Natasha Vang, B.S., 2004, Biology, University of North Carolina-Chapel Hill, B.S., 2010, Anthropology, Middle Tennessee State University

Jessica Vannatta, B.S., 2012, Biology, Middle Tennessee State University

Joseph Weiss, B.S., 2013, Biology, Middle Tennessee State University



PhD GRADUATE TEACHING ASSISTANTS

Heather Barker, B.S., 2000, Mathematics and Science Studies, Southern Adventist University; M.S. Ed., 2004, Outdoor Teacher Education, Southern Adventist University

Bhawana, B.S., 2006, Biotechnology, Utar Pradesh Tech University; M.S., 2009, Professional Science, Middle Tennessee State University

Jeff Bonner, B.S., 2002, Biology, University of Georgia; M.A.E., 2010, Education, Cumberland University

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

Vernon Dodson, B.S., 2009, Biological Sciences, University of Tennessee-Knoxville

Thilina Fernando, B.S. 2009, Botany, University of Peradeniya

Chatoria Kent, B.S., 2004, Biology; M.S., 2007, Biotechnology, Middle Tennessee State University

Manoj Khadka, B.S., 2004, Microbiology, Tribhuvan University; M.S., 2008, Microbiology, Tribhuvan University

Sandra Lampley, B.S., 2000, Biology/Community and Public Health; M.A., 2008, Administration and Supervision, Middle Tennessee State University

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

Karen Maynard, B.S., 2006, Biology/Psychology, Martin Methodist College; P.S.M., 2009, Biotechnology, Middle Tennessee State University

Yohannes Mehari, B.S., 2005, Medical Technology, University of Asmara, M.S., Microbiology, Jilin University, China

David Owens, B.S., 2002, Biology, Middle Tennessee State University

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

Jennifer Parrish, B.S., 1998 Winthrop University; M.A., 2007 University of Northern Colorado

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

Amy Shaffer, B.S., 2011, Biology, Middle Tennessee State University

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

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

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

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

Katelyn Walsh, B.S., 2010, Environmental Science; M.S., 2010, Environmental Science, Drexel University

Scholars Week Highlights Research of Faculty and Students

Middle Tennessee State University held its annual Scholars Week April 1-5, 2013. The Department presented 31 posters. Authors on these posters included 18 faculty members, 19 graduate students and 19 undergraduate students.

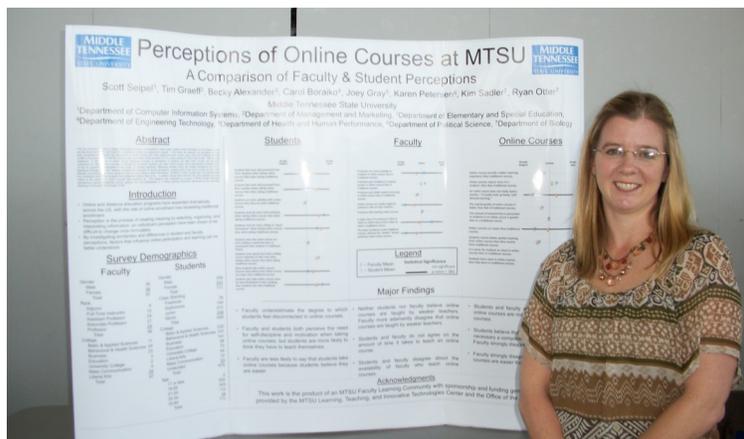
Awards were given to the top three posters presented by graduate students and undergraduate students from each college. The poster presented by Michael Floyd, Jeannie Stubblefield and Anthony Newsome tied for first place in the graduate student division.

The faculty members involved in mentoring these students deserve credit for their time, efforts and expertise in these research projects. The poster session was very well-attended by the university community. A large number of people from across the campus were able to see 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, along with abstracts from all posters and presentations, visit <http://www.mtsu.edu/research/scholarsWeek/>. Poster authors and titles from the Department of Biology are given below:

Faculty Presentations

Tim Graeff (Management and Marketing), Scott Seipel (Computer Information Systems), Carol Boraiko (Engineering Technology), Joel Gray (Health and Human Performance), Karen Peterson (Political Science), **Kim Sadler**, **Ryan Otter** presented “Perceptions of Online Courses at MTSU: A Faculty to Student Comparison.”



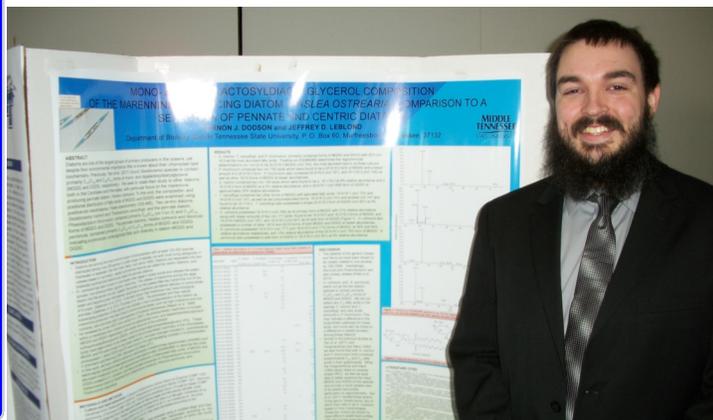
Thiruparan Balachandran (graduate, Engineering Technology), Saleh Sbenaty, (Engineering Technology), **Jeffrey Walck** presented “Remote Humidity and Temperature Real-Time Monitoring System for the Study of the After-Ripening Process in Seeds.”

Brian Robertson, **Kim Sadler**, **Suzanne Hicks** (Graduate) presented “Learning to Click: Student Perceptions of Learning with Response Device Technology in College Biology Courses.”



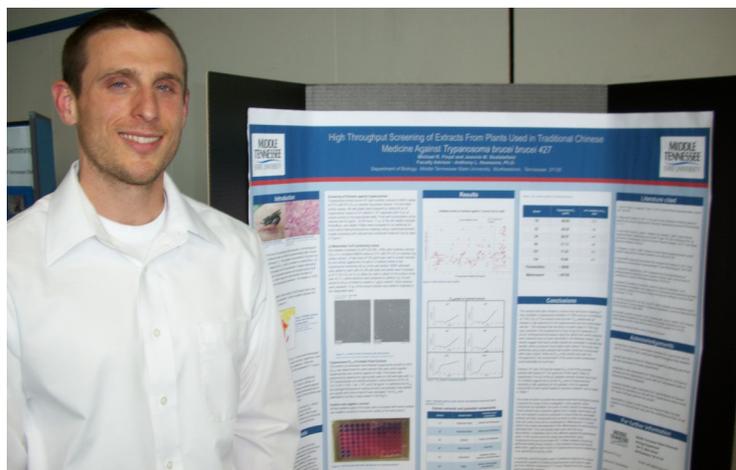
Graduate Student Presentations

Josh Dodson, **Jeff Leblond** (faculty) presented “Mono- and Digalactosyldiacylglycerol Composition of the Marenzelleria-Producing Diatom, *Haslea ostrearia*: Comparison to a Selection of Pennate and Centric Diatoms.”

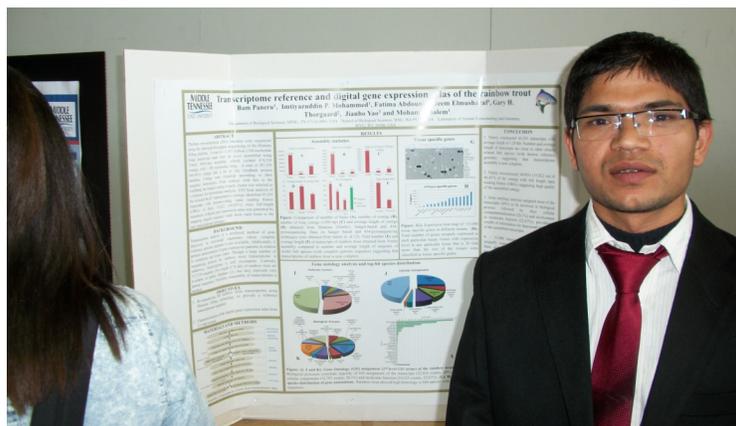


Scholars Week cont.

Michael Floyd, Jeannie Stubblefield, Anthony Newsome (faculty) presented “High Throughput Screening of Extracts from Plants Used in Traditional Chinese Medicine Against *Trypanosoma brucei*.”



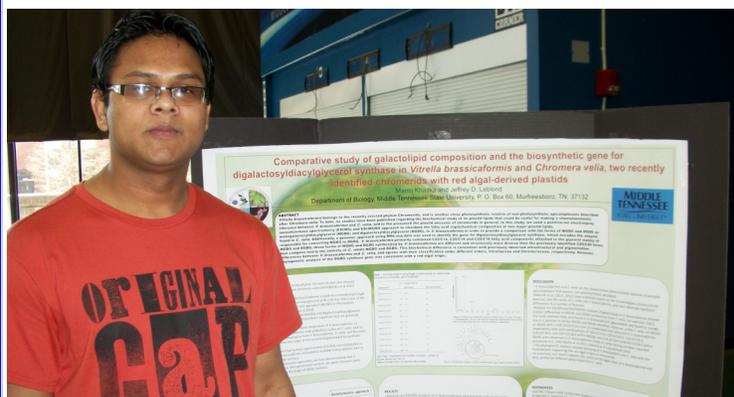
Bam Paneru, Imtiyazuddin Mohammed, Fatima Abdouni, Reem Elmusharaf, Jianbo Yao (West Virginia University), **Gary Thorgaard** (Washington State University), **Mohamed Salem** (faculty) presented “Transcriptome Reference and Digital Gene Expression Atlas of the Rainbow Trout.”



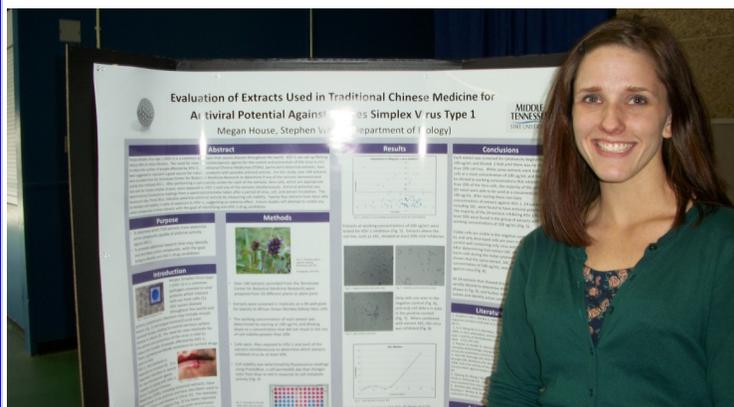
Chasity Suttle, Paul Kline (Chemistry), **Anthony Farone** (faculty), **Mary Farone** (faculty), presented “Analysis of the Rate of Decay and Dispersion of Pentobarbital in Soil.”

Karen Maynard, James West (Vanderbilt University Medical Center), **Rebecca Seipelt-Thiemann** (faculty) presented “RNPEPL1 Expression Decreases in LPS Induced Inflammation.”

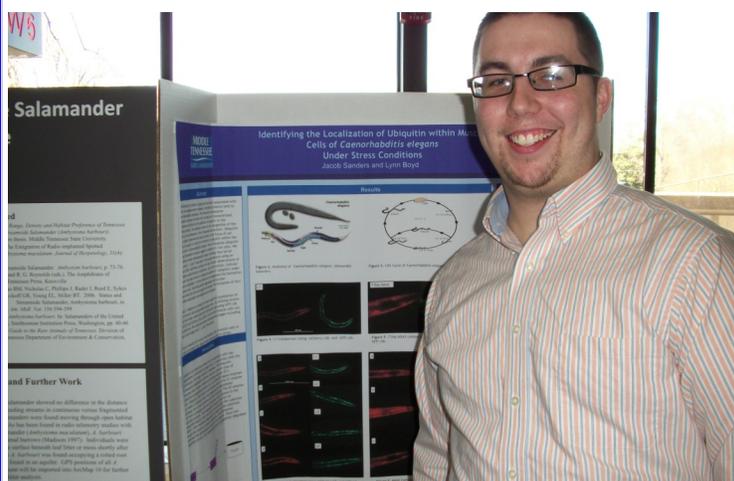
Manoj Khadka, Jeffrey Leblond (faculty) presented “Mono- and Digalactosyldiacylglycerol Composition of *Vitrella Brassicaformis*, a Recently Identified, Second Member of the Chromerida: Comparison to *Chromera velia*.”



Megan House, Stephen Wright (faculty) presented “Evaluation of Extracts used in Traditional Chinese Medicine for Antiviral Potential Against Herpes Simplex Virus Type 1.”

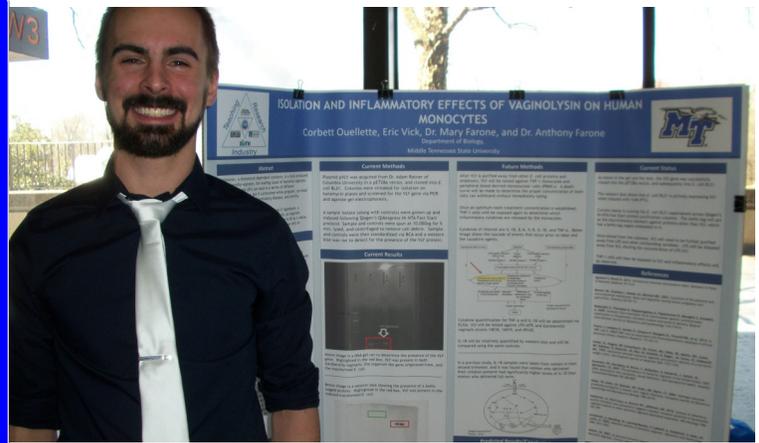
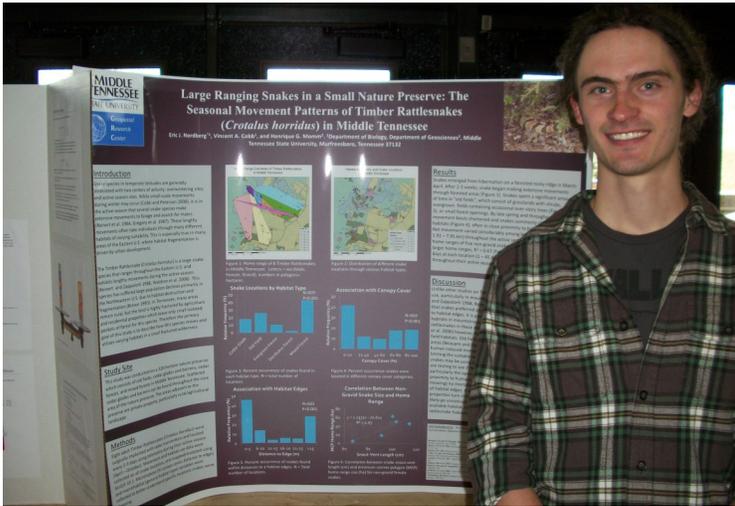


Jacob Sanders, Lynn Boyd (faculty) presented “Identifying the Localizations of Ubiquitin within Muscle Cells under Stressful Conditions.”



Scholars Week cont.

Eric Nordberg, Henrique Momm (faculty, Geosciences), **Vince Cobb** (faculty) presented “Large Ranging Snakes in a Small Nature Preserve: The Seasonal Movement Patterns of Timber Rattlesnakes (*Crotalus horridus*) in Middle Tennessee.”



Zena Tenenbaum, Kim Sadler (faculty) presented “A Qualitative Study of the Summer Youth Science Leadership Internship at the Great Smoky Mountains Institute at Tremont.”

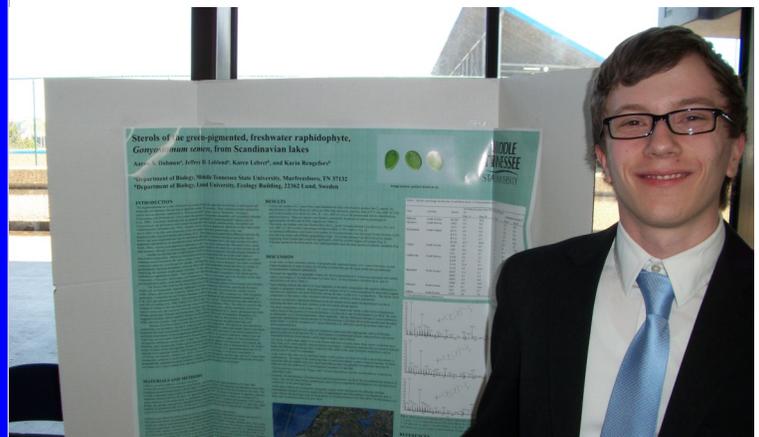


Emily Mattison, Brian Miller (faculty) presented “Terrestrial Movement and Habitat Use of the Streamside Salamander (*Ambystoma barbouri*) in Middle Tennessee.”



Undergraduate Student Presentations

Aaron Dahmen, Jeff Leblond (faculty) presented “Sterols from the Green-Pigmented, Freshwater Raphidophyte, *Gonyostomum semen*, from Scandinavian Lakes.”



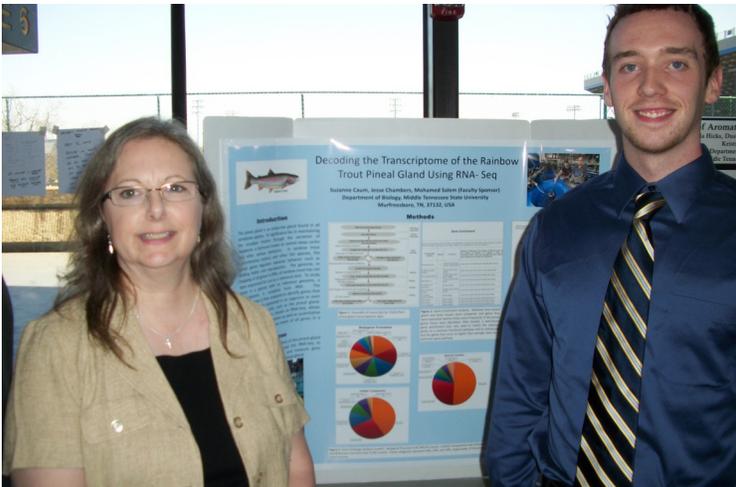
Scholars Week cont.

Alissa Ruggle, Rebecca Seipelt-Thiemann (faculty) presented “Specific Mutation Effects on Encoded Proteins Associated with the MTHFR Gene.”

Ashlee Moore-Lovitt, Donald Kendrick (Psychology), **Bruce Cahoon** (faculty), Donald Kendrick (Psychology) presented “Is There a Sensation Seeking Gene? Examining the Relationship Among Family History, the COMT Val158MET SNP, and Sensation Seeking.”

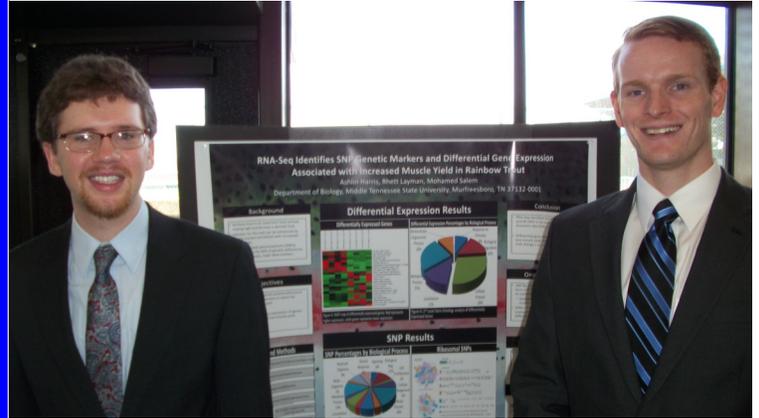


Suzanne Caum, Jesse Chambers, Mohamed Salem (faculty) presented “Decoding the Transcriptome of the Rainbow Trout Pineal Gland using RNA-SEQ.”

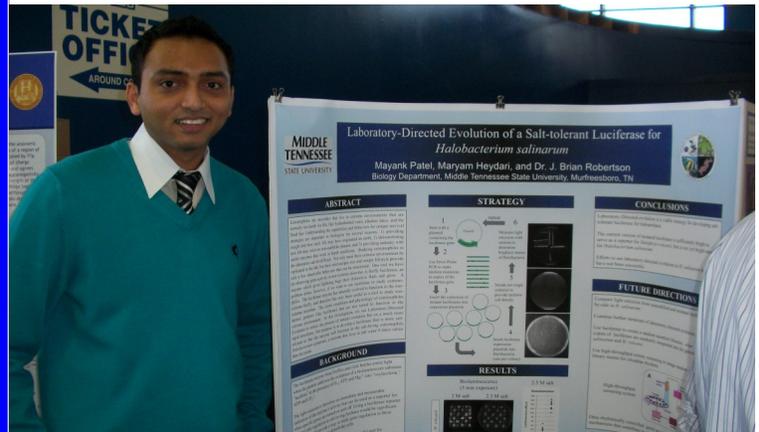


Rance Solomon, James Cooper, Gabriel Welker, **Anthony Farone** (faculty), **Mary, Farone** (faculty), Daniel Erenso (Physics and Astronomy) presented “Relative Deformability of Red Blood Cells in Sickle Cell Trait and Sickle Cell Anemia by Trapping and Dragging.”

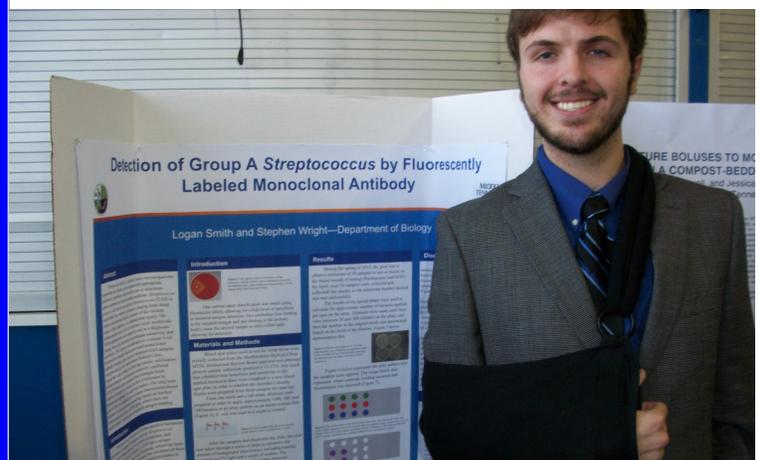
Ashlin Harris, Rhett Layman (Graduate), **Mohamed Salem** (faculty) presented “TNA-SEQ Identifies SNP Genetic Markers and Differential Gene Expression Associated with Increased Muscle Yield in Rainbow Trout.”



Mayank Patel, Maryam Heydari, James Robertson (faculty) presented “Laboratory-Directed Evolution of a Salt-Tolerant Luciferase for *Halobacterium salinarum*.”

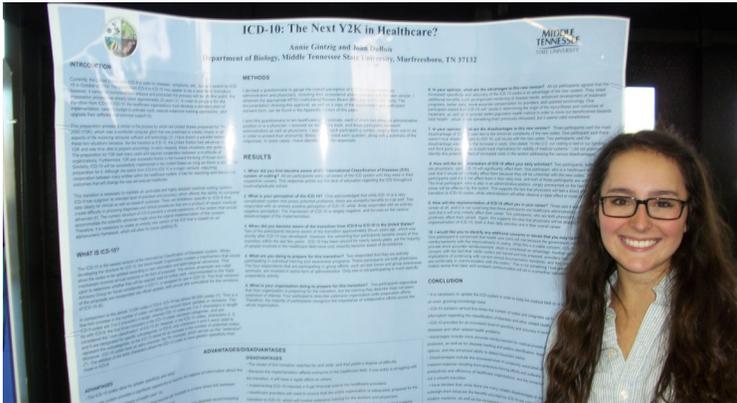


Logan Smith, Stephen Wright (faculty) presented “Detection of Group A *Streptococcus* by Fluorescently-Labeled Monoclonal Antibody.”

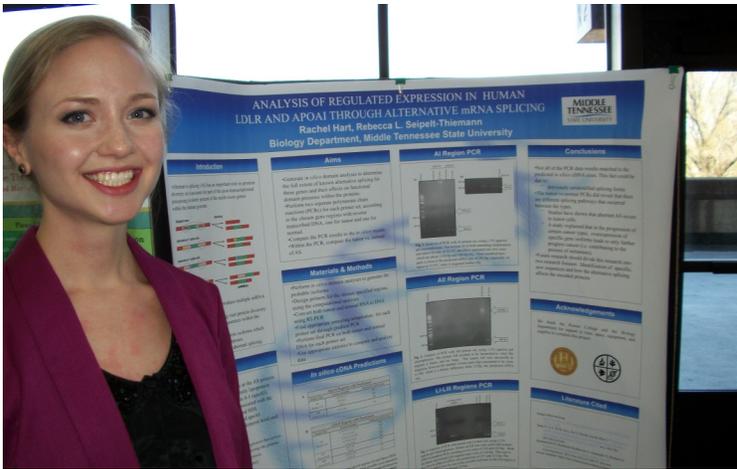


Scholars Week cont.

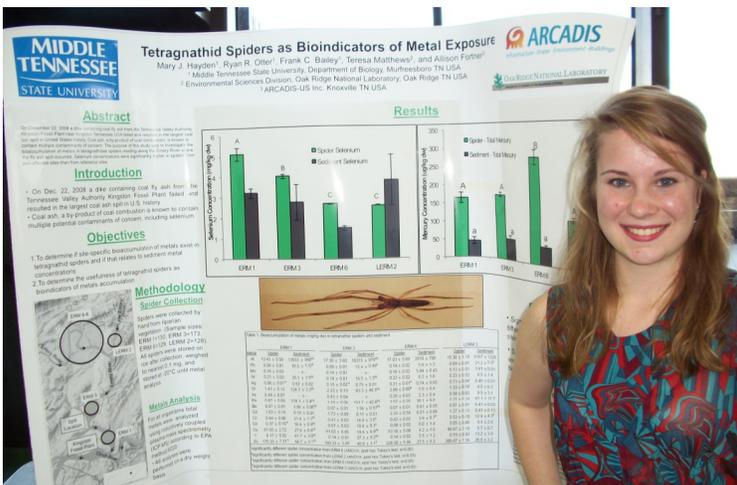
AnneElizabeth Gintzig, John DuBois (faculty) presented “ICD-10: The Next Y2K for Healthcare?”



Rachel Hart, Rebecca Seipelt-Thiemann (faculty) presented “An Analysis of Regulated Expression in Genes LDL-R and APOA1 through Alternative Gene Splicing.”

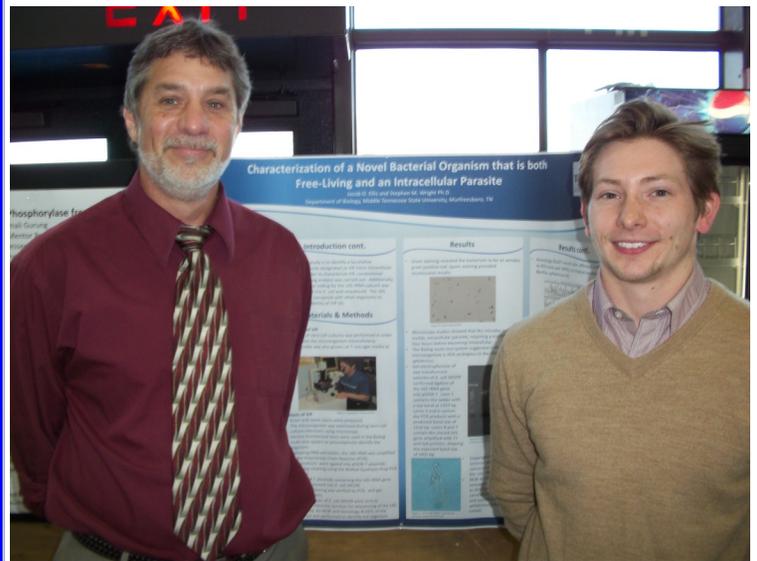


Mary Hayden, Frank Bailey (faculty), **Ryan Otter** (faculty) presented “Impacts of the Kingston Fly Ash Spill on Tetragnathidae Spiders: A Bioaccumulation Study with Food Web Implications.”

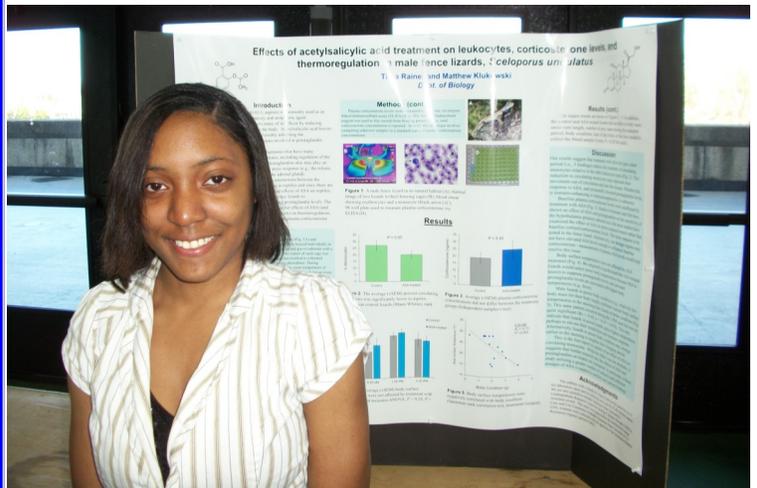


Kristen Tithof, Stephen Wright (faculty) presented “The Effect of Phage Therapy on *Escherichia coli*: Potential Use as an Antibiotic Alternative.”

Jake Ellis, Stephen Wright (faculty) presented “Characterization of a Novel Bacterial Organism that is Both Free-Living and an Intracellular Parasite.”



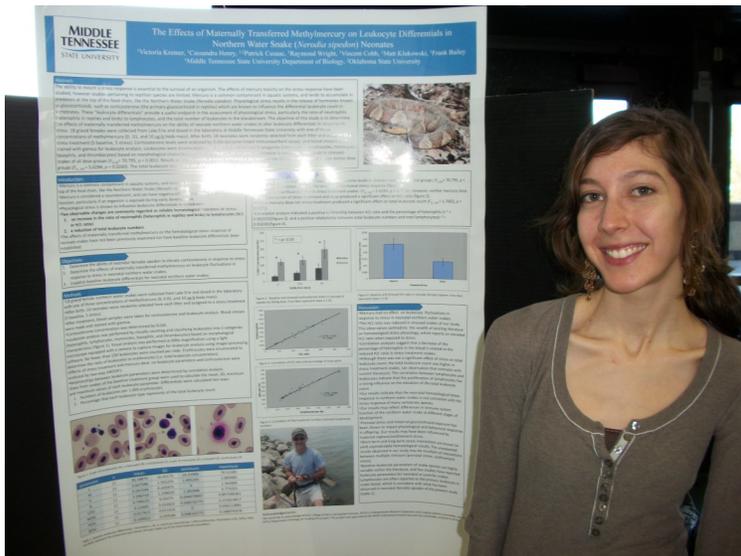
Tiara Rainer, Matt Klukowski (faculty) presented “Effects of Acetylsalicylic Acid Treatment on Leukocytes, Corticosterone Levels, and Thermoregulation in Male Fence Lizards, *Sceloporus undulatus*.”



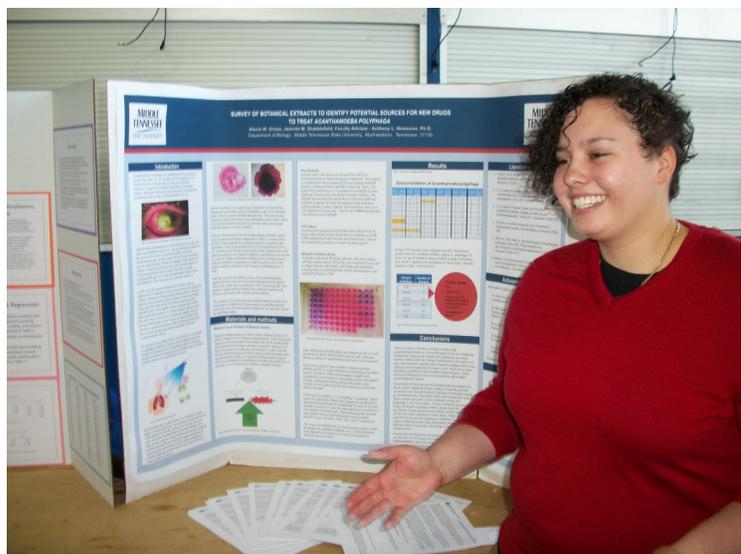
James Cooper Rance Solomon, Cameron Crawford, Josh Evans, Daniel Erenso (Physics and Astronomy), **Anthony Farone** (faculty), **Mary Farone** (faculty), presented “A Laser Trap as a Viscometer.”

Scholars Week cont.

Victoria Kremer, Cassandra Henry, Patrick Cusaac (graduate), **Raymond Wright** (graduate), **Vincent Cobb** (faculty), **Matt Klukowski** (faculty), **Frank Bailey** (faculty) presented "The Effects of Maternally Transferred Methylmercury on Leukocyte Differentials in Northern Water Snake (*Nerodia sipedon*) Neonates."



Alexis Gross, Jeannie Stubblefield (graduate), **Anthony Newsome** (faculty) presented "Survey of Botanical Extracts to Identify Potential Sources for New Drugs to Treat *Acanthamoeba polyphaga*."



The Next Scholars Week is
March 17-21, 2014

Retired Faculty

(continued from page 6)

ments at MTSU have included general biology (majors and non-majors along with Honors General Biology), general microbiology, and mycology. His early research on ultrastructure of spore formation led to several publications in *Mycologia*, and to his receipt of the MTSU Foundation Award for Distinguished Research in 1990. His publications on myxomycete biodiversity have appeared in *Castanea* and in the *Journal of the Tennessee Academy of Science*. Other publications include *Laboratory Experiences in Botany* (Kendall-Hunt Publishers), an article on sick building syndrome in *Archives of Environmental Health*, and a piece for the general public on the dangers of household molds in *Tennessee Conservationist Magazine*. His special knowledge of the fungal kingdom has led to numerous professional consultancies dealing with sick building syndrome and mold infestations of private homes. No description of Dr. Rosing would be complete without reference to his qualities as a classroom teacher. He always set high standards, both for himself and his students. One colleague noted that when new scientific information emerged, "Dr. Rosing always gets his facts straight and quickly integrated them into his courses." Lucid "chalk talks," punctuated by cogent bits of humor characterized his pedagogic style. Two nominations for the MTSU Foundation Outstanding Teacher Award are among his treasured honors. Dr. Rosing was been involved in many professional service roles at MTSU and in the middle Tennessee community. He served two three-year terms on the Faculty Senate, including three one-year terms on the Faculty Senate Steering Committee. He was been affiliated with Phi Kappa Phi honor society and active in Sigma Xi, the Scientific Research Society, serving the latter organization in the roles of president-elect and president. He also served on many departmental and University committees and as faculty advisor to MTSU's Lambda group. He also served a six-year term as co-chair of the Nashville Chapter of PFLAG (Parents, Families, and Friends of Lesbians and Gays). Rosing feels that much credit belongs to his parents, neither of whom graduated from high school, but both of whom placed great value on education. He and his brother, Robert, a retired professor of geography (Salisbury State University, Maryland), earned Ph.D. degrees and, as Dr. Rosing puts it, "... from two junior high graduates to two Ph.D.'s in one generation probably doesn't happen often." He will be spending his free time enjoying the company of his Rhodesian Ridgeback, his partner Troy, gardening, and travel.

Full-Time Temporary and Adjunct Faculty Play Major Roles

The combination of increased enrollments and decreased funding brings 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 faculty and six adjunct faculty. Six of the nine temporary/adjunct faculty hold the doctoral degree and two hold Master's degrees.

These faculty are teaching Human Anatomy and Physiology I & II, Radiation Biology, Seminar on Environmental Problems, Non-Flowering Plants, and Comparative Anatomy of Vertebrates. 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 in an ever-increasing number of course sections, but, also they fill in for research faculty that 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 involving graduate and undergraduate students. The department is forever grateful for their service.

Full-Time Temporary Faculty

Dr. Christopher Brian Manning, B.S., 1996; M.S., 1998 MTSU; Ph.D., 2003, University of Vermont. Teaching: Biology 2010/2011 Anatomy & Physiology I Lecture and Lab.

Dr. Amy Massengill, B.S., 1993, Stetson University; D.V.M., 1997, University of Florida. Teaching: Biology 2021 Anatomy & Physiology II Lab, and Biology 3021/5021 Comparative Anatomy of the Vertebrates Lab

Mary Matthews, B.S., 1992; M.S., 2002, MTSU. Teaching: 2021 Anatomy & Physiology II Lab.

Adjunct Faculty

Dr. Steve Edwards, B.A., 1973, University of California, San Diego; Ph.D., 1980, University of California, San Diego. Teaching: Biology 2011 Anatomy and Physiology I Lab

Dr. Siti Hidayati, B.S., 1986, University of Gadjah Mada; M.S. 1993; Ph.D., 2000, University of Kentucky. Teaching: Biology 3030 Non-flowering Plants

Richard Martin, B.S., 1974, MTSU. Teaching: Biology 3070 Biology Seminar on Environmental Problems.

Dr. Melody Noah, B.A., 1982, UT - Knoxville; M.D., 1986, University of Tennessee College of Medicine, Memphis, TN. Teaching: Biology 2011 Anatomy and Physiology I Lab.

Dr. Jucilene Pereira, B.S., 2000, Universidade Catolica de Pernambuco; M.S., 2003; Ph.D., 2009, Universidade Federal de Pernambuco. Teaching: Biology 4150 Radiation Biology

Teresa Stegall-Faulk, B.S., 1997; M.S., 2000, MTSU. Teaching: Biology 2020/2021 Anatomy & Physiology II Lecture and Lab.

ALUMNI making their mark

Tiffany Saul (B.S.'02; M.S.'13) is currently a doctoral student in Anthropology at the University of Tennessee – Knoxville.

Daniel Roberts (M.S.'07) was recently promoted to Lieutenant Colonel (from Major) in the US Air Force.

Robyn Loureiro (Biggs) (B.S. '97) attended the University of North Carolina-Chapel Hill for graduate school and earned her PhD in Genetics and Molecular Biology in 2005. She completed post-doctoral research in the lab of Dr. Patricia D'Amore at Harvard Medical School. In 2009, she got the opportunity to apply her research background within the biotech/pharmaceutical sector. She has worked for a few companies and is finishing her first year as a Senior Scientist at Shire (which is based in Lexington, MA) where her role is focused on the discovery and development of novel therapeutics for the treatment of rare human genetic diseases. She is thoroughly enjoying her work and the patient-centric company culture at Shire! She lives in Arlington, MA (just 5 miles outside of Boston) with her two children, Wilson age 9 and Isabella age 6.

Biology Department Scholarship Winners, 2013

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 each and every student recipient.

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

Rachel Yates

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

Ki'Ara Rainer

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

Logan Smith

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.

Mary Hayden

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

Brad McCrary

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.

Linda Duong

Deanna Phipps

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

Jennifer Hawthorne Joshua Wienskowski

Maria de los Reyes Microbiology Scholarship—Awarded to a Biology major of sophomore standing or above who has completed Biology 1110, 1120, 2230, and 3250 by the spring semester, and has declared an emphasis in microbiology.

Marcelle Albert

Charles R. McGhee Scholarship—Awarded to a Biology major of junior, senior, or graduate standing seeking licensure to teach Biology.

Rachel Lytle

Eugene F. Strobel Scholarship—Awarded to a Biology major of junior standing (60-100 hours earned), who plans a teaching career at the secondary or college level.

Victoria Kremer

Kevin Driver Memorial Scholarship—Awarded to a student of junior standing (minimum of 85 hours earned) with an interest in Organismal Biology, Physical Therapy or Sports Medicine.

Victoria Kremer

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

Lauren Hanberry

John D. DuBois Scholarship—Awarded to undergraduate or graduate students to provide travel for paper presentations at scientific meetings.

Penny Carroll

Opal Leonard

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

Sarah Barns

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

Archana Krishnamoorthy

Charles Holland Biology Club Scholarship—Available to students enrolled in the graduate program

Shane Ostman

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

Rachel Lytle

Biology Department Scholarship Winners, 2013

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

Victoria Kremer

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

Jessica Vannatta

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

Jennifer Hawthorne Haley Pimental

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

Jennifer Hawthorne Joshua Wienczkowski

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

Alyssa Hoekstra

John M. Zamora Graduate Research Scholarship-To provide support for expenses associated with thesis research.

Robert Newby

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

Penny Carroll Opal Leonard

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

Robert Newby

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

Haley Pimental

Major Field Test High Score
Fall 2012 Ruben Tavakalov
Spring 2013 Adam Banach

Incoming Freshman Scholarships 2013-2014

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.

1st place scorer:

Justice Adewumi-Ezell Harding Christian School, Antioch, TN

2nd place scorer:

Dillon Nall-Montgomery Central High School, Cunningham, TN

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.

3rd place scorer:

Abbey Tolbert-Fairview High School, Fairview, TN

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.

4th place scorer:

Rachael Hicks-Hixon High School, Hixon, TN

