

BioUpdate

Department of Biology, Middle Tennessee State University

Spring 2021



Dennis Mullen

In this issue

- New Faculty
- In the News . . .
- Lab Updates
- Featured Faculty
- Center for Environmental Education
- Adjunct Faculty
- 2020-2021 GTAs
- Graduations
- Scholars Week
- Scholarship Recipients

Message from the Chair

Greetings:

I am excited to fill you in on all the happenings in the Department of Biology over the last year. First off, due to a failed Chair search, and with the support of my colleagues, I evolved from my position as Interim Chair to actual Chair. I am humbled by the trust that my colleagues have placed in me.

Obviously, I cannot talk about the past year without mentioning the impact that the current pandemic has had on teaching, research and service in the department. It has affected what classes we were able to offer, how we were able to teach those classes, and even how we will teach some of them in the future. Much of the research activity in the department was impacted (especially over the late spring and summer), in most cases lab activity was forced to be reduced to the minimum level possible while still meeting grant requirements. Undergraduate and graduate students had limited (if any) access to the labs for several months. Faculty and students were unable to give in-person presentations of their research at regional, national, and international conferences. Although many of those presentations were conducted virtually, the experience is not the same, especially for the students. Any public service activity that could not be conducted remotely was cancelled.

That is the bad news. The good news is that we are working our way out of it. Remote and mixed format teaching is going smoothly this semester, most summer classes will be taught on ground (while still following safe COVID guidelines) and the university is planning on being fully on ground in the fall. The research labs are starting to bustle again, and there are 65 undergraduate students signed up for our undergraduate research course this semester (that is a record). Biology and Forensic Science students gave eighteen presentations at this year's Scholars Day celebration. Both the Outstanding Undergraduate Presentation and the Outstanding Graduate Student Presentation were won by Biology students. It will not be long before faculty and students are able to talk in person to public interest groups and lead public interest field trips again.

continued...



from the Chair ...

There have been several changes in the Biology faculty. Dr. Cindi Smith-Walters retired in the summer of 2020 and Dr. Gore Ervin will be retiring this summer. Please read the short tributes to these two influential people later in this newsletter. We hired two new faculty members. Dr. April Weissmiller, who came to us from Vanderbilt University, studies factors regulating gene expression in pediatric cancer and teaches Genetics and Molecular Genetics courses. Dr. Maryann (Liz) Barnes came to us from Arizona State University. Her research focuses on finding effective methods of teaching about societally controversial topics to college students. Dr. Barnes and Dr. Weissmiller have hit the ground running, their labs are in full swing and they are already working with graduate and undergraduate students. You can read more about both of them later in this edition. As we wind up Spring 2021, we are also in the process of searching for a physiologist to replace Dr. Ervin.

New Faculty



April Weissmiller joined the Biology Department as an Assistant Professor in August 2020. She received her Ph.D. from University of California San Diego and completed her post-doctoral training at Vanderbilt University. Dr. Weissmiller's work is focused on unraveling how the oncoprotein transcription factor MYC accesses and uses members of chromatin regulatory complexes to drive target gene expression in cancer. Specifically, the laboratory is interested in dissecting the role that members of the SWI/SNF chromatin remodeling complex and histone methyltransferase complexes play in regulating MYC-driven transcriptional programs in two rare pediatric cancers thematically tied together by overt MYC deregulation: malignant rhabdoid tumors (MRT) and N-MYC amplified neuroblastoma.

As a biology education researcher, **M. Elizabeth "Liz" Barnes**, studies how to teach topics in biology that are controversial in society. Historically, her work has been focused on how to reduce tension between students' religious beliefs and their learning of evolution. She has published 17 articles including a novel instructional framework called "[Religious Cultural Competence in Evolution Education \(ReCCEE\)](#)", which has been written about in [Scientific American](#), the [Smithsonian](#), and [Skeptic](#) magazines. The American Association for the Advancement of Science's (AAAS) program on Dialogue on Science Ethics and Religion (DoSER) recently published an [interview](#) with Liz on how to reduce tension between religion and evolution. Liz's work has caught national attention because of her novel approach to teaching controversial topics in biology. While the biology



continued...

New Faculty

M. Elizabeth “Liz” Barnes...

community has often taken a stance of dismissing or ignoring religious beliefs ([Barnes & Brownell, 2016](#)), Liz has focused on how to identify where particular conflicts exist for students and how to reduce the perceived conflict between a student’s personal identity and evolution ([Barnes et al., 2017](#); [Barnes, Werner, et al., 2020](#); [Truong et al., 2018](#)).

Liz joined the department of biology at MTSU in August 2020. As a National Science Foundation Graduate Research Fellow (NSF GRF) she finished her Ph.D. from Arizona State University under the supervision of Dr. Sara Brownell. After her Ph.D., she received a NSF Improving Undergraduate STEM Education (I-USE) grant to continue her work as a post-doctoral scholar at ASU exploring how to improve undergraduate evolution education. She is now finishing this grant work at MTSU.

Since joining the department of biology, Liz has expanded her work on evolution education to new projects examining attitudes towards climate change, vaccines, and COVID19 mitigation efforts. She is currently working with seven undergraduate researchers on three Undergraduate Research and Creative Activity (URECA) team grants: (1) examining MTSU undergraduate perceptions, attitudes, behaviors, and communication related to COVID19 mitigation efforts as well as how religious and political identity might influence student attitudes and behaviors, (2) examining interventions for how to increase climate change acceptance and (3) looking at the effect of cultural competence in evolution education in an online environment.

Liz’s research is also focused on how to increase diversity, equity, and inclusion in the biological sciences. As a first generation student from a nontraditional background, Liz has been recognized for her own unique journey into academia ([here](#) and [here](#)) and that experience has created her drive for improving the experiences of students from disadvantaged or nontraditional backgrounds. She has begun this work by examining the experiences of Black/African American students learning evolution ([Barnes, Supriya, et al., 2020](#)), because these students tend to be more religious, are severely underrepresented in evolutionary biology, and also may face many other barriers to being included and recognized in the undergraduate biology classroom. She is now working with former MTSU Ph.D. student Angela Google (who recently successfully defended her dissertation!), current PhD student Lisa Hanson, and current undergraduate Chloe Bowen on a project in which they are interviewing Black graduate students in biology to gain insights into how to improve their experiences and create more inclusive graduate biology education.



In the News...

Dr. Mary Farone was showcased in the August 20, 2020 Issue of MTSU News Faculty/Staff News —

Microbiology researcher Farone earns Career Achievement Award

by Gina E. Fann



Joking that even though she's a "lab rat" who often savors the solitude of her research, MTSU biology professor Mary Farone acknowledged that accepting the university's highest faculty honor alone, in a pandemic-forced virtual celebration, isn't how she prefers to work.

Farone, a microbiologist who began her MTSU career as an adjunct in 1996, is the 2020 recipient of the MTSU Foundation's Career Achievement Award, recognized Thursday, Aug. 20, at the university's Fall Faculty Meeting for her teaching, research and service to students.

University President Sidney A. McPhee presented Farone with her award in MTSU's Tucker Theatre, the traditional site for the annual faculty gathering before each new academic year begins.

"In times like this pandemic, I'm not surprised to be standing here alone to receive this award, but I shouldn't be, because I didn't get to this point in my career alone," said Farone, a professor in MTSU's Department of Biology who is internationally recognized for her work with host-pathogen interactions in animals and the environment.

She's best known for her collaborative research with colleagues and students at Tennessee Tech University and at MTSU, including her husband, biology professor Anthony Farone, on two odd bacteria, found in a Cookeville, Tennessee, hot tub in 1999 and now studied for nearly 20 years, that invaded mammal cells' nuclei and replicated.

Read the complete article at <https://mtsunews.com/2020-mtsu-foundation-awards/>
(MTSU file photo by J. Intintol)

In the News...

Dr. Dennis Mullen was showcased in the October 14, 2020 Issue of MTSU News Service to Students —

Honors Biology professor takes time to help students juggle challenging schedules

by Carol Stuart

Biology Professor Dennis Mullen has had to adjust some of his instruction while teaching first-semester Honors Biology classes in the middle of a pandemic—but it's communication with his MTSU students where he's especially making extra efforts.

In each of his Fall 2020 courses, 10 of the 20 students rotate by odd- and even-numbered weeks into in-person lectures in their Honors building classroom, where they can interact with their professor. The other half can watch Mullen's instruction remotely on livestream or later on video, and then the next week the groups switch. Students also alternate for the lab portion.

"I think the biggest challenges are knowing where they're supposed to be, when they're supposed to be there, for each of their multiple classes," Mullen said.

"Their lives have got to be confusing and complicated. So, the thing that I'm trying to do more than anything else is just constant communication . . . so they're not surprised and they can plan for it."

Each Friday afternoon Mullen emails students outlining exactly what's happening the next week. And, during a Zoom meeting with 25 Biology Club members recently, he just asked, "How's it going? What are your biggest challenges?" "That's what they said – knowing what they had to do for each of their classes each week," Mullen said. "I can imagine. It's a challenge of coordination, planning, especially for freshmen and sophomores who really have not ever had to do that in their lives before."

Read the complete article at <https://mtsunews.com/honors-biology-professor-takes-time-to-help-students-juggle-challenging-schedules/> (MTSU file photo by J. Intintol)



In the News...



Dr. Rebecca Seipelt-Thiemann was showcased in the February 22, 2021 Issue of MTSU News Service to Students—

MTSU lifelong learner adapts to teaching biology, research technology changes amid pandemic
by Randy Weiler

Becky Seipelt-Thiemann spends some of her downtime away from her work at MTSU learning to play the cello. Daughter Laurel plays the stringed instrument at Central Magnet School, and they have split a private lesson time weekly for three years.

“I like learning new things and it’s a pretty instrument, too,” Seipelt-Thiemann, an MTSU biology professor now in her 21st year, said of the lessons, which moved from in-person to virtual like her classes in March 2020 because of the COVID-19 pandemic.

Learning new things is what has driven Seipelt-Thiemann, who lives in Smyrna, Tennessee, for as long as she can remember. At an early age, she gravitated toward STEM (science, technology, engineering and math), particularly biology.

Read the complete article at <https://mtsunews.com/mtsu-lifelong-learner-adapts-to-teaching-biology-research-technology-changes-amid-pandemic/>

Dr. Elizabeth Barnes was showcased in the November 24, 2020 MTSU News Faculty/Staff News—

MTSU researcher-led study: Instructors need to address compatibility of religion, science while teaching evolution

by Randy Weiler

MTSU researcher-led study: Instructors need to address compatibility of religion, science while teaching evolution

A first-of-its-kind study led by Middle Tennessee State University biology researcher Elizabeth Barnes suggests that a difference in culture and beliefs between science instructors and students may inadvertently lead to low acceptance of evolution among minority students — particularly Black students — in biology.

Barnes and Arizona State University researchers asked whether Black and Hispanic students tended to reject evolution more than students from other racial/ethnic identities and whether any differences could be explained by the fact they tend to be more religious.



Read the complete article at <https://mtsunews.com/researcher-led-evolution-study-results-published/>

(MTSU photo by J. Intintol)

In the News...



The **COVID-19 vaccines**, their safety and efficacy, and the processes by which they were developed and approved were the topics on a recent “**MTSU On the Record**” radio program.

Host **Gina Logue**’s interview with Dr. **Anthony Farone**, a professor of biology specializing in immunology and microbiology,

first aired Dec. 22 on **WMOT-FM Roots Radio 89.5** and www.wmot.org.

Public health experts say they hope at least 70 percent of Americans will get one of the approved vaccines developed by **Pfizer** and **Moderna**.

The U.S. Food and Drug Administration has issued emergency approvals for both, and they’re already being administered to health care workers and public officials and distributed to county health departments and other providers.

Priority for receiving the vaccines goes to people in high-risk categories, including health care workers, nursing home residents, teachers, food service workers and first responders.

Farone warns that people still must remain vigilant about handwashing, social distancing and other COVID-19 protocols even after they get their shots.

“You may not get sick, but that doesn’t mean that you can’t still be an amplifier of the virus,” Farone said. “Even though you might not be infected for as long because you’ve been vaccinated, your immune response is not the same as a mask. It still allows the virus to get in. It has to be recognized, and during that recognition phase, you’re still spreading the virus to other people.”

Listen to the complete interview at <https://mtsunews.com/farone-on-the-record-dec2020/>

Biology Lab Updates

From the lab of Donald Walker



Alex Romer recently published a paper documenting skin shedding behavior of watersnakes.

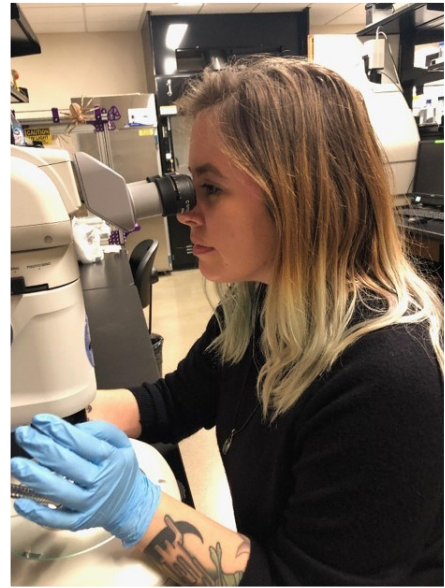
Romer, A.S., West, J., Phipps, E., Moe, K., **Walker, D.M.** 2021. *Nerodia sipedon* (Northern Water Snake) shedding. *The Tennessee Journal of Herpetology*. 4: 24-26.

Biology Lab Updates

From the lab of Donald Walker



Matthew Grisnik will defend his PhD dissertation focused on the bat skin microbiome response to the white-nose pathogen.



Ashton Reece will defend her MSc thesis during which she characterized a bacterium that lives inside of the white-nose fungal pathogen of bats.



Reed Alexander started his field work for 2021 at restored Tennessee and Kentucky wetlands. He will measure microbial community response to wetting, drying, and nutrient pulses in a field and mesocosm experiment.

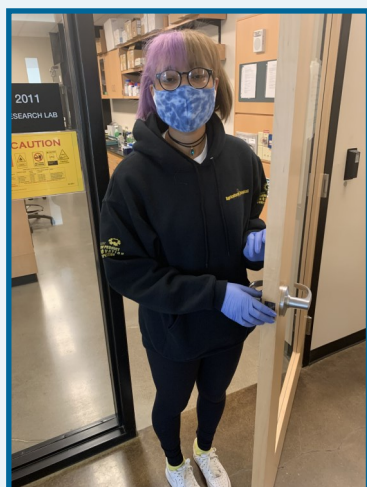
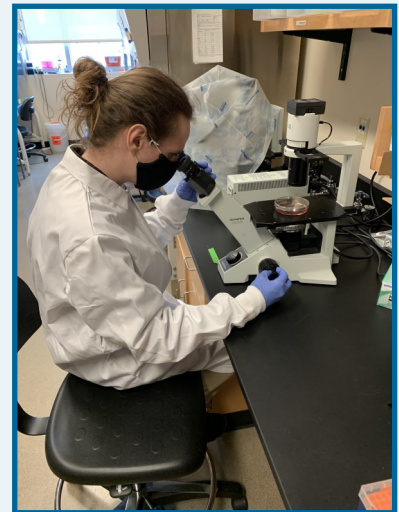
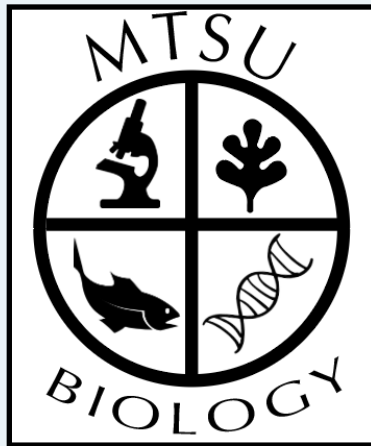
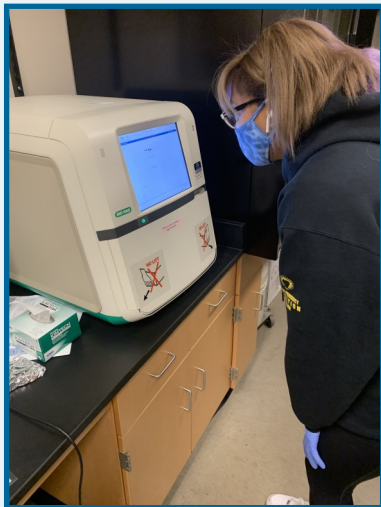


Biology Lab Updates

From the lab of April Weissmiller

The Weissmiller laboratory uses a combination of genetic, genomic, molecular, and biochemical approaches to answer questions with a high level of detail and mechanism. It is the goal of the research that the basic biology uncovered will be used to drive translationally applicable research and inform new therapeutic avenues to explore.

Jack Maxwell and Cheyenne Jones are two current undergraduates in the Weissmiller laboratory focused on MRT biology. They are working as a team to probe a new mechanism by which MYC may be functioning to drive the MRT cancer state. Both Jack and Cheyenne applied for and obtained their own research funding this semester: Jack has been awarded a URECA research award and Cheyenne has been awarded a research stipend as part of her acceptance into the Tennessee Louis Stokes Alliance for Minority Participation (TLSAMP) program.



Biology Lab Updates

From the lab of Rebecca Seipelt-Thiemann

Honors Thesis students graduated -

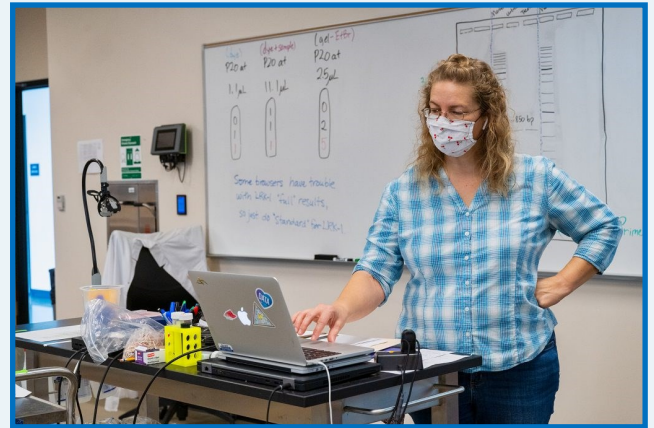
Madonna Ghobrial Dec. 2020

Russell Walden Dec. 2020

Chase Burton May 2021

Niah Frantzen May 2021

Alaa Mohammed May 2021



Recent Publications

Journal Articles

Boury, N., Alvarez, K., Garcia Costas, A., Knapp, G., **Seipelt-Thiemann, R. L.** (2021). Teaching in the Time of COVID-19: Creation of a Digital Internship to Develop Scientific Thinking Skills and Create Science Literacy Exercises for Use in Remote Classrooms. *Journal of Microbiology and Biology Education*, 22.

Merryman, M., Crigler, J., **Seipelt-Thiemann, R. L.**, McClelland, E. (2020). A mutation in *C. neoformans* mitochondrial NADH dehydrogenase results in increased virulence in mice. *Virulence*, 11(1), 1366-1378. <https://doi.org/10.1080/21505594.2020.1831332>

Ali, M. F., Tansie, S., Shahan, J., **Seipelt-Thiemann, R. L.**, McClelland, E. (2020). Serial Passage of *Cryptococcus neoformans* in *Galleria mellonella* Results in Increased Capsule and Intracellular Replication in Hemocytes, but Not Increased Resistance to Hydrogen Peroxide. *Pathogens*, 9(732), 1-16.

Subramani, A., Griggs, P., Frantzen, N., Mendez, J., Tucker, J., Murriel, J., Sircy, L. M., Millican, G. E., McClelland, E. E., **Seipelt-Thiemann, R. L.**, Nelson, D. E. (2020). Intracellular *Cryptococcus neoformans* disrupts the transcriptome profile of M1- and M2- polarized host macrophages. *PLOS ONE*.
<https://journals.plos.org/plosone/article?id=10.1371/journal.pone.0233818>

Biology Lab Updates

Kim Cleary Sadler's (Lab) News



As co-director for the Center for Cedar Glade Studies, one of my favorite things to do is share the cedar glades with people eager to learn more. Due to the pandemic, the Elsie Quarterman Festival last year was cancelled but this year's 2021 program is full of wonderful hikes and presentations, many are biology department alumni: Todd Crabtree, Tennessee state botanist; Dr. Steve Murphree, professor of biology, Belmont; Melissa Turrentine, middle school teacher; Sharen Bracey, ethnobotanist; and, she is not an alumnus but Linda Robertson, native plant specialist, is Dr. Brian Robertson's aunt. I'm uncertain when this edition of BioUpdate will publish but the date for this year is April 30 & May 1, for 2022 mark the calendar for April 29 & 30. See www.mtsu.edu/glade-center for more information.

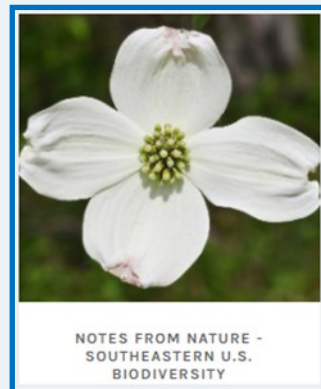
I have also been collaborating with Grassmere Zoo's volunteer group called Zoo Teens. In past years teens have come to MTSU for workshops about cedar glades during the winter, followed by spring and summer hikes at Flat Rock. Since we have not been able to meet in person, Zoom has been an okay substitute. One presentation I did about cedar glades the Zoo Teen coordinator made available to the entire US, so there were teens from Maine to San Francisco attending.

My fall Honors non-majors BIOL 1030 classes are EXL (experiential learning) designated which requires students experience some aspect of the discipline. Two projects students completed were: (1) a crowd-sourcing search for antibiotic-producing bacteria (Tiny Earth Project), and (2) an ecological restoration project. Students collected and analyzed cedar glade soils (with super-

vision and TDEC approval). They did serial dilutions, isolated, cultured, and evaluated colonies based on morphology, response to selected safe ESKAPE isolates, and common antibiotics. Their work was impressive considering most had never done any type of lab work or analysis before. Findings were presented during a class poster session.



The second project in the field removing invasive pest plants at Oaklands wetlands was cancelled due to the pandemic but instead students completed a virtual citizen science project with Zooniverse. (www.zooniverse.org). Researchers post projects on Zooniverse to get assistance from the public. My classes joined the *Notes from Nature: Southeastern Grassland Initiative* project and transcribed more than 1,200 herbarium sheets of specimens collected in limestone cedar glades and barrens. When I demonstrated to students how to transcribe, the first herbarium sheet that was displayed was a specimen collected by Dr. Kurt Blum in the late 1960s!



Biology Lab Updates

Kim Cleary Sadler's (Lab) News (cont.)

If you noticed the display case on the west side of the first floor of the Science building contains representative Tennessee birds, thank MS student Bekka Riley for helping me get it done, along with Drs. Brian Miller and Jeff Walck. My hope is we can continue to find funding for cases to place and fill with interesting specimens throughout the building to share with students and visitors, similar to what was in the Davis Science Building. I haven't noticed anyone taking a selfie by a lab window but I have observed many taken by the chimpanzee, albatross, and lion.



Fortunately, the pandemic did not clip the wings of interdisciplinary MSE doctoral student, Jessica Brown, who completed her dissertation summer 2020. She and I began working together, along with Dr. Angela Barlow, in 2015 when her research advisor abruptly left MTSU. She conducted a case study that examined three 8th grade students' conceptions before, during, and after a unit study on biodiversity. I'm proud of Jessica for completing her dissertation by staying with her research and writing. Jessica has taught middle school science in Williamson county schools for fourteen years.



Brown, Jessica J. 2020. The Influence Of Engagement In Practical Work On Middle School Students' Alternative Conceptions Regarding Biodiversity

From the lab of Jeffrey Walck

Jeff, in collaboration with Dr. Chris Herlihy, obtained a grant from the U.S. Fish and Wildlife Service to examine the mating system and pollination biology of the endangered Pyne's groundplum (*Astragalus bibullatus*). This plant grows on cedar glades and can only in Rutherford County, Tennessee. Siti Hidayati gave six zoom lectures to universities in Indonesia and gave a global zoom lecture sponsored by the Indonesian Embassy in Washington, D.C. in their People to People Series. Over the past year, four papers have been published in *Plants*, *Plant Biology* and *International Journal of Wildland Fire*.

Biology Lab Updates

Mary and Anthony Farone family news

Just a few updates on our family and students:

Grace and her husband are now both at VUMC and living next door to us. Cate has been awarded the top Pre-Law/Political Science student at MTSU and been accepted into law school at Belmont with a full scholarship and UTK. Danny is liking Data Science as a freshman at MTSU and Nicky is a freshman and playing rugby at Father Ryan.

Erin Park, PhD is a Laboratory Director at American Esoteric Labs in Memphis and mainly doing Covid, Covid, Covid (BTW her daughter El has been accepted into the IU PhD program in Micro/Immuno). Raj Ghosh has graduated and is a post doc at Mizzou doing metabolomics. My current PhD student Dan Bryant is doing well working on a novel aureone and its biochemistry. He and Raj worked on a review and a paper below. My foster academic children Jacob Sanders got married, got his PhD from UTK, and got a post doc at University of Texas SW, and Paola Molina has a postdoc at VUMC and will also be getting married this upcoming year after a Covid delay. Mary's foster children Nick Chamberlain is loving his postdoctoral research position at the Rocky Mountain Laboratories in Montana and Pratima Chapagain just defended her dissertation and will also postdoc at VUMC.

Dr. Mary Farone has received two, 3-year grants from the NIH Biomedical Research and Research Training program for \$357,000 to study the "[Trafficking of Two Novel Potential Pathogenic Intracellular Bacteria in Eukaryotic Cells](#)" and \$200,000 from the USDA Agriculture and Food Research Initiative to determine the "ROLE OF PROTOZOAN CYSTS IN PROTECTING PATHOGENS OF THE FRESH PRODUCE INDUSTRY." She is continuing these projects with Drs. Sharon Berk and A. Farone and a team of graduate and undergraduate students.

Recent Publications:

Ghosh R, Bryant DL, Farone AL. *Panax quinquefolius* (North American Ginseng) Polysaccharides as Immunomodulators: Current Research Status and Future Directions. *Molecules*. 2020 Dec 11;25(24):5854. doi: 10.3390/molecules25245854. PMID: 33322293; PMCID: PMC7763949.

Ghosh R, Bryant DL, Arivett BA, Smith SA, Altman E, Kline PC, Farone AL. An acidic polysaccharide (AGC3) isolated from North American ginseng (*Panax quinquefolius*) suspension culture as a potential immunomodulatory nutraceutical. *Curr Res Food Sci*. 2020 Aug 5;3:207-216. doi: 10.1016/j.crfs.2020.07.002. PMID: 32914137; PMCID: PMC7473373.



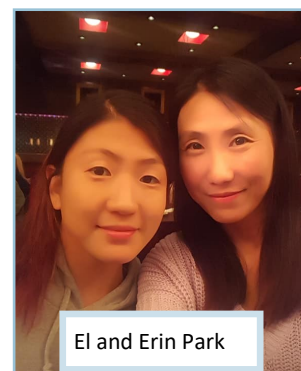
Pratima Chapagain



Raj Ghosh, far right



Nick Chamberlain, third from left



El and Erin Park

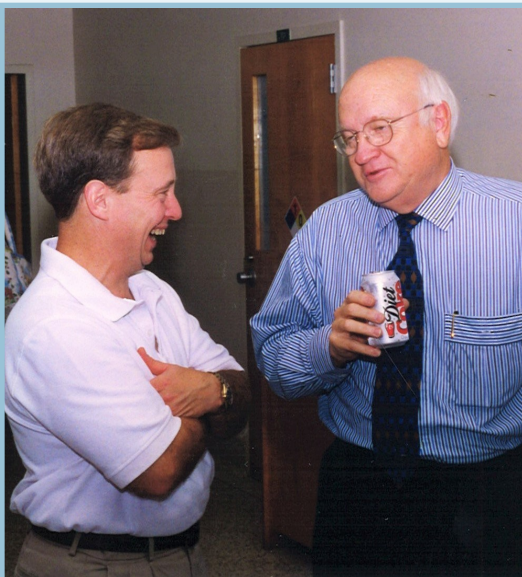
Featured Faculty

Gore Ervin

Gore Ervin will be retiring this spring after a long career of service to the university, the department, the Tennessee Academy of Science and the community. Gore Ervin began teaching at MTSU in the fall of 1997. He came here from an amazing research career in the Perinatal Research Laboratory at Harbor-UCLA Medical Center. Over the course of his career he has over 100 publications, most in high profile peer-reviewed journals with additional book chapters and contributions to a textbook in Obstetrics. During that time, Dr. Ervin was well-known for his challenging courses in Histology and Embryology. Many pre-meds were advised by their peers who had moved on to medical school that these were “must-have” courses for surviving that first year of medical school. Gore additionally helped prepare students for nursing training through teaching Human Anatomy and Physiology. Gore’s support and work for our health science students did not stop there. For over 20 years, he has been the advisor for the MTSU chapter of the Student National Medical Association (SNMA), now known as the Minority Association of Premedical Students (MAPS). Perhaps just as important is his unsung role as informal advisor/mentor to scores of pre-medical students as they navigated the difficult process of medical school application.



For much of his tenure here, Gore was also the departmental Graduate Student Advisor and head of the Graduate Curriculum Committee. He gave invaluable guidance to scores of our MS students. He oversaw our program as it grew and changed with the addition of new faculty and the building of the new Science building, whose final design benefitted from his years of research and teaching expertise and his collegial work in many faculty groups involved in that project. Gore’s service to MTSU also involved being the head of the Institutional Animal Care and Use Committee for many years. He helped ensure that we were able to meet compliance standards when some faculty moved to MTSU with NIH grants or were finally able to compete and win NIH grants. He was instrumental to the growth of the research culture within the department. Gore’s service to the Tennessee Academy of Science came at a crucial time. He took over as editor of the organization’s Journal of the Tennessee Academy of Science in 1998, inheriting a rather substantial backlog of manuscripts that needed reviewing and overdue issues in need of proofing. He diligently caught up the publishing of issues and more, holding the position as editor until 2007.



Featured Faculty

Gore Ervin

Gore also served young people in the community in many ways. He has a long-standing involvement with the Boy Scouts and served as District Commissioner of the Trail of Tears District. He went on annual trips with local groups to Philmont Ranch in New Mexico for extended hiking trips or to the Boundary Waters between Canada and the US for canoeing adventures. Needless to say, he is an accomplished camper and outdoorsman. He additionally helped young people through volunteer efforts at the Discovery Center at Murfree Spring.

Gore's smile and cheerfulness, his thoughtfulness, service and hard work will be greatly missed in the halls of the Science Building next fall. Hopefully, he will be able to enjoy more outdoor time with his wife Bonnie and more quality visits with his son, Brian and daughter and son-in-law Beth and Jesse. They may even make time for a few more family travel and hiking adventures to exotic destinations when travel is easier!



Featured Faculty

Cindi Smith-Walters

Dr. Cindi Smith-Walters Retires July 2020!



Dr. Dennis Mullen asked me to write a few words about Dr. Smith-Walters' retirement. Our offices were proximal to each other for nearly 20 years, so I grappled with where to begin and end. I thought I would begin with three truths and a lie, can you guess which one is the lie? Here you go: (1) She does not eat vegetables and a jalapeño is the only green vegetable she will eat; (2) She played on the stage of the Grand Ole Opry with her band; (3) She has been to the White House to receive an award in conservation and environmental education from the President; and, (4) She has received standing ovations from her students on the last day of class. The answer is at the end of the article.

Dr. Smith-Walters, or Dr. C, as her students called her, joined the MTSU faculty in 1993 after working for the state of Tennessee's CENTS (Conservation Education Now for Tennessee Students) program for five years. She primarily taught a required course for all K-8 education majors, BIOL 3000, *Life Science for Elementary Teachers*. Those of you walking through the ground floor on the north wing of the science building on Monday, Wednesday, and Friday mornings are going to miss the sound of popular music drifting throughout the hall. She embraced and modeled best practices in education by using her incredible sense of humor, love of music, biology in the news, everyday materials (from cheerios to twigs), and her vast personal experiences to guide learning. She prompted her students to think analytically about science in their life and more importantly, their future classroom. Her teaching never stopped within the walls of the classroom but extended to learning in the out-of-doors about bugs, slugs, and all things that create a sense of wonder. Her philosophy about teaching was she wanted her students to see life science as part of, not apart from their lives. Her students left her course fully prepared to teach with an arsenal of free materials, posters, curriculum guides worth more than \$200, and teaching resource trunks full of ready-to-teach activities.

Dr. C modeled teaching excellence for graduate students in the Mathematics and Science Education doctoral program (MSE). She served as chair/co-chair for four dissertations (see below) and several doctoral committees. She mentored many doctoral students and gave them opportunities to apply learning theories while they observed and taught in her classes. She was well-connected with many professional science education organizations (ASTE, NAAEE, NSTA, TAS, TEEA, and TSTA), bringing MSE students to meetings and participating with MSE students in numerous presentations and workshops. Dr. Smith-Walters excellence in teaching did not go unnoticed, she was awarded the CBAS Teaching Excellence Award in 2017.

Teaching was one hat Dr. Smith-Walters wore but one that brought notoriety and a state/nation-wide presence to MTSU was the Center for Environmental Education (CEE). An avid grant-writer, she managed sever-

Featured Faculty

Cindi Smith-Walters

al award-winning programs and secured funding to staff the center for more than fifteen years. For those of you supporting graduate students through grants, you know this is no easy feat.

Through her guidance and expertise, she brought high quality environmental education information and programs to Tennessee and beyond. See the CEE section of BioUpdate for the history of the center.

There is so much more I can say about Dr. Smith-Walters and her contributions to the department, the college, MTSU, and Tennessee. She has won numerous awards, garnered more than two million dollars in grant funding, published many articles and book chapters, and served on more than 20 committees and professional organization boards. In retirement, she still hasn't run out of steam, she's just like the Eveready battery Energizer bunny.

She and her husband, Dave, a retired forester, continue to volunteer and consult for organizations they hold dear to their hearts such as the Tennessee Master Naturalist Program, Project Learning Tree, Project WILD, and the Tennessee Science Teachers Association. They have met their goal of traveling to all 50 states and 30 National Parks. Oh, as for the three truths and a lie, they are all true! If you want to know more about any of those statements, I know Dr. Smith-Walters will enjoy hearing from you, she still checks her MTSU email: cindi.smith-walters@mtsu.edu.



Dissertation Chair For:

Vee Napoleon-Fanis, 2020, *An Exploration into the Influence of Laboratory Constraints on Biology Graduate Teaching Assistants' Epistemological Beliefs and Science Instructional Practices as a Complex System*

Chatoria Kent Franklin, 2020, *Examining the Influence of Lesson Study on Elementary Science Teachers' Practice*

Heather L. Barker, 2017, *The Influence of Argumentative Discourse on Pre-Service Teachers Alternate Conceptions in Life Science*

David C. Owen, Completed, 2016, *An Analysis of the Effects of Gamification (Repeat Level Test Strategy and Performance Competition Indicators) on Achievement and Motivation in an introductory Biology Laboratory Course*

Center for Environmental Education

Kim Cleary Sadler, Director



You have to touch the heart to teach the mind – Jack Hanna

I have included this timeless quote from Jack Hanna to begin a brief reflection about the history of the Center for Environmental Education (CEE) at MTSU. For more than thirty-five years the CEE has offered outreach, programs, workshops, and resources to touch hearts to teach the mind about the environment. The CEE has been in three different locations around campus and now resides in the Davis Science building in the former biology department office. In the late 1980's the Tennessee Valley Authority provided a small sum of seed money to selected state universities to promote environmental education. Dr. Race Bergman, professor of elementary education, started the CEE as a collection of environmental education resources. Shortly thereafter, Race passed the CEE collection on to Dr. Patrick Doyle, professor of biology, and a huge advocate of educating about the environment. It was an easy transition because Pat had also started the recycling program at MTSU in 1972, funding hundreds of dollars of scholarships. The directorship of the center was assumed by Dr. Padgett Kelly, who was hired in 1990, and Dr. Cindi Smith-Walters, in 1993. I worked as a consultant for the CEE initially in 1993, became associate director in 2002 and now serve as director.

Cindi was a prolific grant-writer, after she joined MTSU she immediately got busy writing grants. She has written greater than ten million dollars in grant proposals and received funding totaling more than \$2,500,000 at the time of her retirement last summer. External funds she garnered supported 4 full-time positions and several part-time positions throughout the years. She now serves as the center's most active volunteer, having facilitated at least 12 programs since January. Educating about the environment was always front and center as Cindi and the CEE staff "Talked Trash" with a state-wide solid waste education program and regional "Waterworks" program dedicated to protecting Tennessee waterways from storm water runoff. Padgett instilled his love of the marine environment as he "wowed" audiences with a model of a life-size whale his BIOL 3000 students helped him make from trash bags and duct tape. A few of my favorite projects are establishing MTSU as an arboretum, developing informational videos/activity guides, and coordinating the microscope loan program. The things I mentioned here are just a fraction of what the center has accomplished through the years and still continues to offer through external funding and volunteer efforts to touch the heart to open the mind of our middle Tennessee friends.



CEE (cont.)

We continue this year with pride through a project providing invaluable state-wide data about our “canaries in the coal mine,” the amphibian populations vulnerable to the effects of habitat loss, pollution, and climate change. As part of the National Amphibian Monitoring Program (NARM), the Tennessee Amphibian Monitoring Program (TAMP) was again funded in the 2020/2021 fiscal year by a partnership with the Tennessee Wildlife Resources Agency and Middle Tennessee State University’s Center for Environmental Education. Bob English has served as CEE staff and TAMP state director since 2004 and our flagship program continued to make milestones despite limitations with COVID-19.

TAMP volunteers were encouraged to run their routes only if they could do so safely. Many experienced volunteers who normally run their routes by themselves were able to continue to contribute data. However, many volunteers who typically run their routes with multiple people (like University of Tennessee student volunteers) opted not to run their routes this year. That being said, TAMP did get data from number of routes this year and hopefully things will return to normal next year as the pandemic slows.

BIG NEWS! Many additional features were added to the TAMP website this year, and now the entire TAMP workshop is now online. This allows any potential volunteer to receive the same training in video format online that we have been presenting at the University of Tennessee since 2002. The TAMP website can be found at: [TAMP Home Page \(leaps.ms\)](https://leaps.ms)

MORE BIG NEWS! The integrated database containing all TAMP data from 2004 to 2021 will be updated at the end of this sampling season. This database is designed to be used with GIS and will be incorporated into the Tennessee Wildlife Resources Agency's State Wildlife Action Plan (SWAP). The SWAP plan addresses the management of non-game species of greatest conservation need in the state, and we are happy to be part of this effort.



Crawfish Frog – Como TAMP Route
©2021 Robert English Leaps

We are particularly pleased that due in part to data contributed by TAMP volunteers, Crawfish Frogs (see photo) will be “deemed in need of management” effective June 22nd, 2021. Wildlife “in need of management” means any species or subspecies of wildlife that needs specific management to prevent it from becoming a threatened species within the state in the foreseeable future. Management practices include conservation and protection of specific habitats (yes, they sometimes inhabit crayfish burrows) that support these species. We are indebted to TAMP volunteers across the state for their diligent collection of data.

Look for an upcoming article about TAMP in the *Tennessee Conservationist* magazine this year to increase awareness statewide of the TAMP program and the TAMP website. If you have questions about TAMP, Bob English can be contacted at bob.english@mtsu.edu. Additional questions about TAMP or CEE programs can be directed to Kim Sadler at kim.sadler@mtsu.edu.

Department Graphic Shirts and More

The department is selling shirts, backpacks, insulated lunch bags, coffee mugs, lanyards, and stadium cups that sport the department graphic. The T-shirts come in short-sleeve or long-sleeve with the Biology logo front and center or on the upper-left front. Several faculty and students have been spotted wearing the shirts. The coffee mugs are white with the graphic in blue on both sides (visible whether you are right- or left-handed). The stadium cups are 16-ounce blue plastic with a white MTSU Biology graphic. The key lanyards are blue ribbed-polyester cord with a white MTSU Biology graphic. Come by and check out the merchandise in SCI 2044. You might even want to add your own personal flair by custom-ordering a T-shirt with your favorite color combination.

T-shirts	Short-Sleeve:	\$15	Insulated lunch bag:	\$8
	Long-Sleeve:	\$20	Drawstring backpack:	\$5
Sweatshirts	Crew Neck:	\$25	Stadium Cups:	\$1
	Pull-over hoodie:	\$30	Coffee Mugs:	\$5

All items can be purchased (cash only) in the department office (SCI 2044)
or by email at Biology@mtsu.edu.



Full-Time Temporary and Adjunct Faculty Play Major Roles

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

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

Full-Time Temporary Faculty

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

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

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

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

Adjunct Faculty

Dr. J. Logan Bowling, B.S., 2013, Middle Tennessee State University; Ph.D., 2020, Middle Tennessee State University. Teaching: General Biology I labs and Cell and Molecular Biology labs

Dr. Cole Easson, B.S., 2008, University of Mississippi; Ph.D., 2013, University of Mississippi. Teaching: Genetics

Full-Time Temporary and Adjunct Faculty Cont.

Adjunct Faculty

Dr. Chatoria Franklin, B.S., 2004, Middle Tennessee State University; M.S., 2007, Middle Tennessee State University; Ph.D., 2020, Middle Tennessee State University. Teaching: Human Anatomy and Physiology I labs

Ms. Heather Green, B.S. 1997, Middle Tennessee State University; M.S.T., 2004, Middle Tennessee State University. Teaching: General Biology I labs

Mr. Jonathan Jackson, B.S., 2006, Iowa State University; M.A. 2012, Iowa State University; M.S., 2018, Arizona State University; Ph.D. candidate 2020, Arizona State University. Teaching: Exploring Life labs

Dr. Karen Maynard, B.S., 2006, Martin Methodist College; M.S., 2009, Middle Tennessee State University; Ph.D., 2014, Middle Tennessee State University. Teaching: Human Anatomy and Physiology I and II labs

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



BioUpdate

Dennis Mullen, department chair (Dennis.Mullen@mtsu.edu)

Produced by MTSU Department of Biology

Key contributors to this issue of *BioUpdate*: Dennis Mullen, Amy Jetton, Kim Sadler

0421-9717 / Middle Tennessee State University does not discriminate against students, employees, or applicants for admission or employment on the basis of race, color, religion, creed, national origin, sex, sexual orientation, gender identity/expression, disability, age, status as a protected veteran, genetic information, or any other legally protected class with respect to all employment, programs, and activities sponsored by MTSU. The Assistant to the President for Institutional Equity and Compliance has been designated to handle inquiries regarding the non-discrimination policies and can be reached at Cope Administration Building 116, 1301 East Main Street, Murfreesboro, TN 37132; Marian.Wilson@mtsu.edu; or 615-898-2185. The MTSU policy on non-discrimination can be found at mtsu.edu/iec.

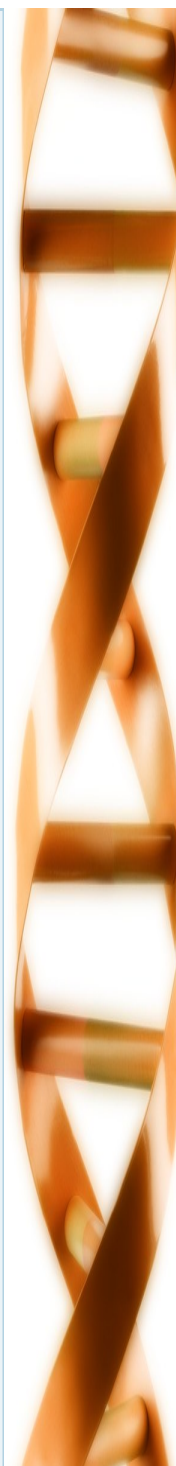
2020-21 Graduate Teaching Assistants

For the 2020-2021 academic year, the department is providing support to 27 M.S.-level and 16 Ph.D.-level graduate students who serve as graduate teaching assistants (GTAs). Sixteen of these students have received undergraduate degrees from colleges and universities other than MTSU. Thirteen hold baccalaureate degrees in subjects other than biology (animal science, biochemistry, chemistry, computer science, environmental science, liberal arts, microbiology, psychology, science, Spanish and wildlife fisheries science.) Four of these assistants have received baccalaureate or master's degrees from universities outside the United States. All have the requisite training in biology to serve as departmental teaching assistants. Without these GTAs, the department would be unable to offer the many sections of the non-majors biology course (BIOL 1030) and the majors freshman courses (BIOL 1110/1120), along with some sophomore and junior laboratories. The department is very pleased to have them.

M.S. Biology Graduate Teaching Assistants

Atia Ahmed, B.S., Biochemistry, 2019, Middle Tennessee State University
Logan Campbell, B.S., Biology, 2018, University of Tennessee at Martin
Robert Dixon, B.S., Biology, 2020, Middle Tennessee State University
Mathysyn Fields, B.S., Psychology, 2020, Middle Tennessee State University
Sarah Garcia, B.S., Biology, 2020, Middle Tennessee State University
Neal Halper, B.S., Chemistry, 2019, Middle Tennessee State University
Alexis Hamous, B.S., Animal Science, 2017, Oklahoma State University
Shane Hardin, B.S., Wildlife and Fisheries Science, 2020, University of Tennessee-Knoxville
Austin Hargrove, B.S., Science, 2018, Middle Tennessee State University
McKenna Hunt, B.S., Biology, 2019, University of Alabama
Sarah Khan, B.S. Biology, 2019, Middle Tennessee State University
Daniel Knorp, B.S., Biology, 2019, Middle Tennessee State University
James Mendez, B.S., Biology, 2018, Middle Tennessee State University
Deborah Nwadike, B.S., Microbiology, 2016, University of Benin
Selena Ranney, B.S., Environmental Science, 2020, Middle Tennessee State University
J. Ashton Reece, B.S., Biology, 2019, Middle Tennessee State University
Rebekkah Riley, B.S., Biology/Spanish, 2020, Middle Tennessee State University

(continued)



2020-21 Graduate Teaching Assistants

M.S. Biology Graduate Teaching Assistants

Katy Salazar, B.S., Biology, 2020, Middle Tennessee State University

Serenah Smith, B.S., Biology/Computer Science, 2017, Middle Tennessee State University

Delaney Therrien, B.S., Biology, 2020, Middle Tennessee State University

Samuel Troyer, B.S., Biology, 2020, Middle Tennessee State University

Essete Tsahai, B.S., Biology, 2019, Middle Tennessee State University

Clinton Warren, B.S., Biology, 2019, Middle Tennessee State University

Kirsten Welch, B.S., Biology, 2019, Middle Tennessee State University

Henry Whittemore, B.A., Liberal Arts, 2018, St. Johns College

Carl Womack, B.S., Biology, 2020, Middle Tennessee State University

Thomas Woodward, B.S., Biology, 2020, Middle Tennessee State University



COLLEGE OF
GRADUATE STUDIES

2020-21 Graduate Teaching Assistants

Ph.D. GRADUATE TEACHING ASSISTANTS



Molecular Biosciences Program

Daniel Bryant, B.S., Biology, 2014, Middle Tennessee State University

Kevin Cavey, B.S., Biology, 2018, Middle Tennessee State University

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

Joy Creighton, B.S. Biology, 2014, Georgia Southern University

Nicole Gammons, B.S., Biology, 2018, Middle Tennessee State University

Matthew Grisnik, B.S., Biology, 2014, University of Findlay; M.S., Biology, 2016, Marshall University

Csilla K. Szepe, B.S., Biology, 2018, Middle Tennessee State University

Math and Science Education Program

Brock Couch, B.S., Biology, 2015, Missouri Western State College; M.S., Biology, 2018, University of Maryland

Angela Google, B.S., Biology, 2007; M.Ed., Environmental Science, 2010, University of Tennessee-Chattanooga

Zachary Grimes, B.S., Biology, 2015, M.S., Biology, 2017, Middle Tennessee State University

Lisa Hanson, M.S., Education, 2012, Touro College; M.S., Biology, 2017, Texas State University

Zhigang Jia, B.S., Biological Sciences, 2010, Jilin University, M.S., Biological Education, 2015, Northeast Normal University

Lori Klukowski, B.S., Biology, 1992, Indiana University Bloomington

Andrea Reeder, B.S., Biology, 1989 and M.A.E., 1992, Furman University

Sara Salisbury, B.S., Environmental Science, 2012, Allegheny College; M.S., Biology, 2018, Texas State University

Computational Science Program

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

Theses and Dissertations Completed 2020-2021

Master's Theses

Summer 2020

Campbell, Chelsea, 2020. Ubiquitination Events in the Regulation of a Paternally Supplied Toxin in *C. elegans* (Lynn Boyd, David Nelson, Matt Elrod-Erickson—thesis committee)

Romer, Alexander, 2020. Effects of Snake Fungal Disease on Epidermal Microbiome Dynamics (Donald Walker, Sarah Bergemann, Brian Miller, Josh Ennen—thesis committee)

Fall 2020

Ashley, Jon M., 2020. Multiscale Habitat Selection of a Timber Rattlesnake (*C. horridus*) Population in Middle Tennessee (Vincent Cobb, Jeffrey Walck, Matthew Klukowski—thesis committee)

Spring 2021

Reece, J. Ashton, 2021. Bacterial-Fungal Interactions Affect the Physiology of the Causative Agent of White Nose Syndrome, *Pseudogymnoascus destructans* (Donald Walker, Brian Robertson, Anthony Farone—thesis committee)

Smith, Serenah, 2021. Bioluminescent Reporter Development and Testing for Cre-recombinase and CRISPR/Cas9 Activity for Selectable Marker Recovery in *Scheffersomyces stipitis* (Brian Robertson, Rebecca Seipelt-Thiemann, David Nelson—thesis committee)



Doctoral Dissertations

Spring 2021

Chapagain, Pratima, 2021. Genomic Insights into Host-Microbial Interaction in Rainbow Trout: Potential Role in Fish Growth, Muscle Yield, and Disease Resistance (Mary Farone, Mohamed Salem, Anthony Farone, Jeffrey Leblond, Donald Walker—dissertation committee)

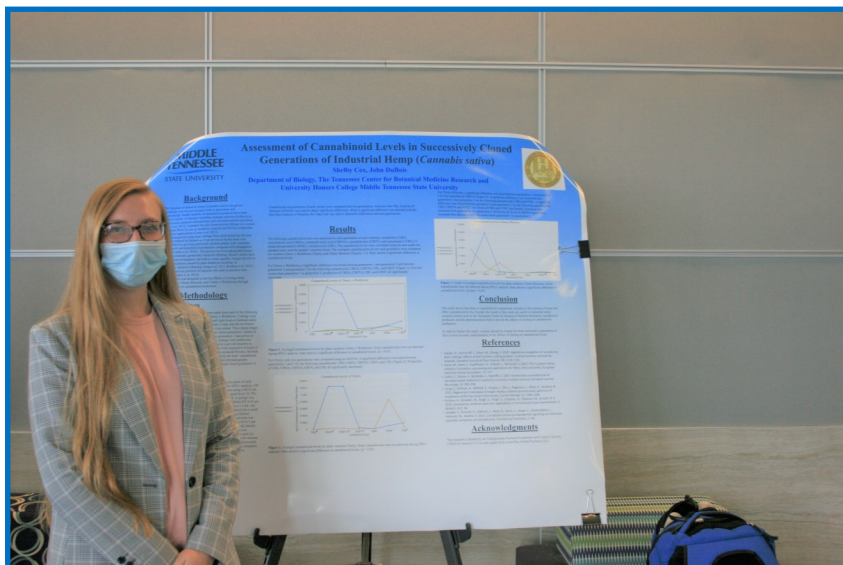
Grisnik, Matthew, 2021. Bat Microbiome Resistance through Functional Redundancy in Response to a Fungal Pathogen (Donald Walker, Mary Farone, Chris Herlihy, Joshua Grinath, John Munafo—dissertation committee)

Smith, Shannon, 2021. Investigating the Impact of Metabolic Manipulation and Clonal Propagation of Industrially Important Plants Using In Vitro Approaches (Elliot Altman, Anthony Farone, Paul Kline, Rebecca Seipelt-Thiemann, Aubrey Cahoon—dissertation committee)

MTSU Undergraduate Research and Creative Activity



The Fall 2020 Undergraduate Research & Creative Activity Open House was an informal poster session that showcased undergraduate student research and creative projects at MTSU. One student from each department was invited to present a poster. All students, particularly new students and transfer students, were invited to attend. This event was an awesome opportunity to experience the world of undergraduate research – learn more about the different projects that students pursue, ask questions about how they became involved in undergraduate research, meet some current faculty mentors, find out details about the spring URECA grants, and learn about SOAR, the student organization devoted to undergraduate research. And, FREE lunch!



Shelby Cox, Biology; **Dr. John Dubois** (faculty sponsor), Biology; "Assessment of Cannabinoid Levels in Successively Cloned Generations of Industrial Hemp (*Cannabis sativa*)"



University-Wide Scholars Week Poster & Creative Activity Exposition

Scholars Week Highlights Faculty and Student Research

Scholars Week 2021, in conjunction with the in-person poster symposium, was hosted digitally this year via a virtual platform - Symposium. Symposium showcased *all* Scholars Week academic posters and student presentations, along with the ability for viewers to post comments and questions related to individual projects.

Brionna Cunningham, undergraduate BIOL, **Ashlin Powell Harris**, graduate student COMS, **Rebecca Seipelt-Thiemann**, Biology; "The Effects of Heat Stress on the *ELT-2* gene in *C. elegans*"

Yaseen Ginnab, undergraduate BIOL/PSY; **Lori Klukowski**, graduate MSE, **Rebecca Seipelt-Thiemann**, Biology; "Osmotic Stress Affects Alternative Splicing of Lifespan-related Gene *DAF-16*"

Deborah Nwadike, graduate student BIOL, **Jeffrey Leblond**, Biology; "MONO- AND DIGALACTOSYLDIACYLGLYCEROL COMPOSITION OF *Pedinomonas minor*, *Pedinomonas* sp., *Pyramimonas parkae*, *Pyramimonas obovata*: A QUEST TO RECONCILE THESE SECONDARY PLASTID ANCESTORS OF THE DINOFLAGELLATE *Lepidodinium chlorophorum* AND EUGLENID *Euglena gracilis*."

Chloe Bowen, undergraduate BIOL, **Alexa Summersill**, undergraduate PSY, Sara E. Brownell, Jamie L. Jensen, **M. Elizabeth Barnes**, Biology; "A Comparison of Religious Cultural Competence in Evolution Education Online versus In-Person and its Effects on Student Outcomes."

Paula Collette, undergraduate PSY/BIOL, **Ashlin Powell Harris**, graduate student COMS, **Rebecca Seipelt-Thiemann**, Biology; "NEMATODE *SOD-2* IS ALTERNATIVELY SPLICED IN THE REGION OF EXON 2 UNDER PEROXIDE-INDUCED OXIDATIVE STRESS"

Maria Hite, undergraduate CHEM, **Rebecca Seipelt-Thiemann**, Biology; "Alternative Splicing of *LRK-1* in *C. elegans* After Exposure to Osmotic Stress"



SCHOLARS WEEK 2021

Kap A. Paull, undergraduate CHEM, **Rebecca Seipelt-Thiemann**, Biology; "Effects of Osmotic Stress by NaCl on *C. elegans*"

Laine Matthews, undergraduate CHEM, **Ashlin Powell Harris**, graduate student COMS, **Rebecca Seipelt-Thiemann**, Biology; "The Effects of Hypoxia on *ELT-2* in *C. Elegans*"

Grace Millican, undergraduate CHEM, **Aarthi Subramani**, graduate MOBI, **Rebecca Seipelt-Thiemann**, Biology, **Erin McClelland**, **David E. Nelson**, Biology; "Exploring interactions between the fungal pathogen *C. neoformans* and host macrophages using transcriptome profiling"

Anna Yuhas, undergraduate FRSC, **Shannon Smith**, graduate MOBI, **John Dubois**, Biology; "Initiation and Cannabinoid Assessment of Trichomes on Industrial Hemp (*Cannabis sativa*)"

University-Wide Scholars Week Poster & Creative Activity Exposition

Scholars Week Highlights Faculty and Student Research

Kendall Benedict, undergraduate BIOL, **Cole G. Easson**, Biology, **Rebecca Seipelt-Thiemann**, Biology; “The Effect of Heat Stress on the Alternative Splicing of LRK-1 in *C.elegans*”

Rebekkah Riley, graduate student BIOL, **M. Elizabeth Barnes**, Biology, Jaqueline Cala, Sara Brownell; “A comparison between community college and university student perceptions about evolution”

John Larsen, undergraduate BIOL, **Sarah Garcia**, graduate BIOL, **Rebecca Seipelt-Thiemann**, Biology; “Effect of Oxidative Stress by Paraquat Exposure on *LRK-1* in *C. elegans*”

Kwinci Britt, undergraduate BIOL, **Mary B. Farone**, Biology, **Anthony L. Farone**, Biology; “How the Infection Rate of *Candidatus* Berkiella cookevillensis can Provide Explanations for Disease Transmission”

Olena James, graduate MSE, **Grant Gardner**, Biology; “Developing inclusive pedagogy practices in STEM faculty”

Brock Couch, graduate student MSE, **Grant Gardner**, Biology; “Using Social Network Analysis to Understand Longitudinal Change in Small Groups”

Damon Stinson, undergraduate BIOL, **Cole G. Easson**, Biology; “Examining Morphological and Genetic Diversity of Freshwater Sponges in Tennessee”

Karolin Abouelyamin, undergraduate BIOL, **Lori Klukowski**, graduate student MSE, **Rebecca Seipelt-Thiemann**, Biology; “Effects of $MgCl_2$ on the Stress-Regulated Gene, *ELT-2*, in *Caenorhabditis Elegans*”

Mariana De Araujo Bryan, undergraduate BIOL, **Thippaphone Niravong**, undergraduate BIOL, **Laine Matthews**, undergraduate CHEM, **M. Elizabeth Barnes**, Biology; “Exploring Undergraduate Biology Students’ Attitudes and Science Communication about COVID19 and COVID19 Vaccines”

Jewel Galloway, undergraduate BIOL, **Stephen Wright**, Biology; “Evaluation of Physiological Traits Expressed *in vitro* and Effects on Plant Growth by *Bacillus* Endophytes”

Hafsa Alhajjaji, undergraduate CHEM, **Rebecca Seipelt-Thiemann**, Biology, **Lori Klukowski**, Mentor; “The Effect of Heat Stress on the Alternative Splicing of LRK-1 in *C.elegans*”

Cassandra Perrone, undergraduate FRSC, **John DuBois**, Biology; “Cloning Successive Generations of Industrial Hemp (*Cannabis sativa*) to Assess Cannabinoid Profiles”

Kenneth Bryant, undergraduate FRSC; **Ashlin Powell Harris**, graduate student COMS, **Rebecca Seipelt-Thiemann**, Biology; “The Splicing of LRK-1 Exon 9 and the Effects of Heat Stressors in Relations to LRRK2”



University-Wide Scholars Week Poster & Creative Activity Exposition

Scholars Week Highlights Faculty and Student Research

Steffany Jenkins, undergraduate BIOL, **J. Brian Robertson**, Biology; "Engineering TetO System to Test a Cell Wall Protein's Contribution to Cell's Strength"

Oliver Wright, undergraduate PSY, **Sarah Garcia**, graduate BIOL, **Rebecca Seipelt-Thiemann**, Biology; "Alternative Splicing of *LRK-1* Exon 3 Reduces the Number of Ankyrin 3 Repeat Domains"

Nyatuil Tongyik, undergraduate, BIOL, **Sarah Garcia**, graduate BIOL, **Rebecca Seipelt-Thiemann**, Biology; "Alternative Splicing of *Caenorhabditis elegans LRK-1* in Response to Oxidative Stress due to Paraquat Exposure"

Davia Watkins, graduate BIOL, **Rebecca Seipelt-Thiemann**, Biology; "Evolutionary Analysis of the Poly-ADP-ribose Polymerase (*PARP*) Gene Family"

Mackenzie McKinnon, undergraduate BIOL, **Lori Klukowski**, graduate student MSE, **Rebecca Seipelt-Thiemann**, Biology; "Alternative Splicing of *ELT-2* Exon 5 is Unlikely to Regulate Hypoxia-Induced Lifespan Extension in *Caenorhabditis elegans*"

Neal Halper, graduate BIOL, **David E. Nelson**, Biology, **Rachel Leander**; "Assessing the Impact of Regulatory Steps in the PINK1:Parkin Pathway"

Madeline Aadnes, undergraduate BIOL, **Aaron Gatewood**, undergraduate BIOL, **M. Elizabeth Barnes**, Biology; "Does teaching the scientific consensus about climate change really lead to higher acceptance of and concern about climate change?"

Christine Adalikwu, undergraduate, CHEM, **Rebecca Seipelt-Thiemann**, Biology; "Oxidative Stress Does Not Affect Alternative Splicing of Transcription Factor *DAF-16* Exon 5 in *C. elegans*"

Maryam Almosajin, undergraduate, BIOL, **Rebecca Seipelt-Thiemann**, Biology; "Alternative Splicing of *LRK-1* in the Region of Exon 15 is Suppressed Under Peroxide-Induced Oxidative Stress"

Charlene Sullivan, undergraduate FRSC, **Omar Ali**, undergraduate BIOL, **Yangseung Jeong**, Biology; "Developing a New Pair-Matching Method for Segregation of Lower Limb Bones Based on Korean CT Images"

Jiwoo Park, undergraduate, BIOL, **David E. Nelson**, Biology; "Evaluating the Effects of a Hyperactive Parkin Mutant on the Dynamics of PINK1:Parkin Mitophagy"

Zhigang Jia, graduate MSE, **Grant Gardner**, Biology; "International graduate students' challenges and experiences of microaggression in cross-cultural teaching of science: A survey study"

Afnan Mohsin, undergraduate BIOL, **Mary B. Faron**, Biology; "The development of Novel Disinfectants Using *Pseudomonas aeruginosa*"

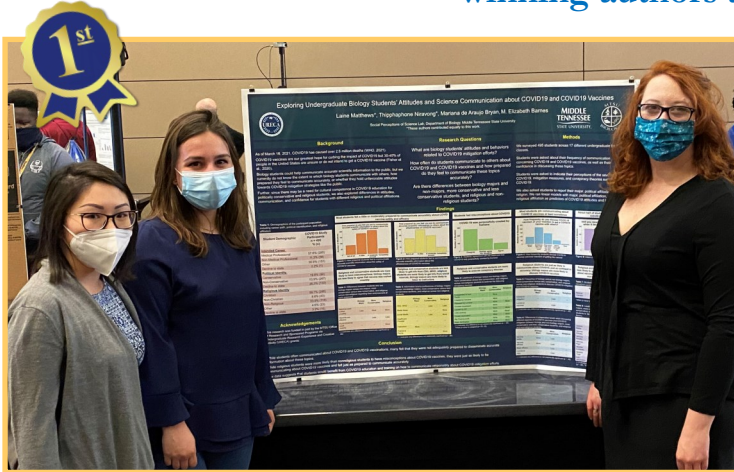


University-Wide Scholars Week Poster & Creative Activity Exposition

Scholars Week 2021

Due to COVID19, multiple rounds of poster presentations were offered to accommodate student presenters and attendees. Each poster session showcased 20 presenters and lasted for 45-minutes. The Department of Biology had first place posters in the CBAS Undergraduate and Graduate divisions!

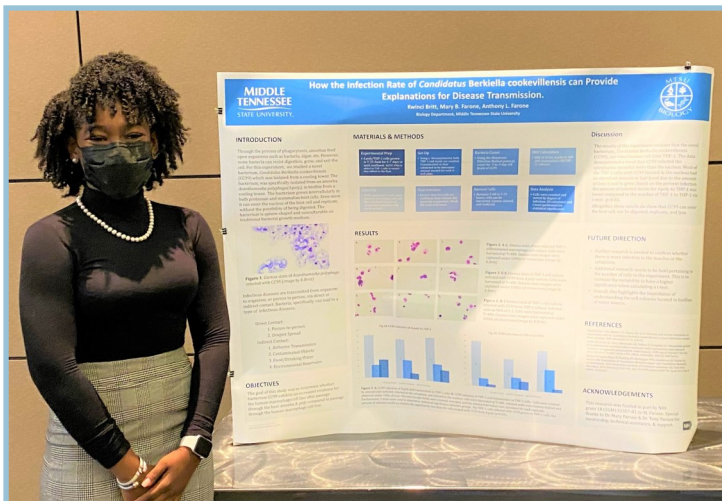
Congratulations to the CBAS 2021 Scholars Week Virtual Poster Competition winning authors and their faculty mentors!



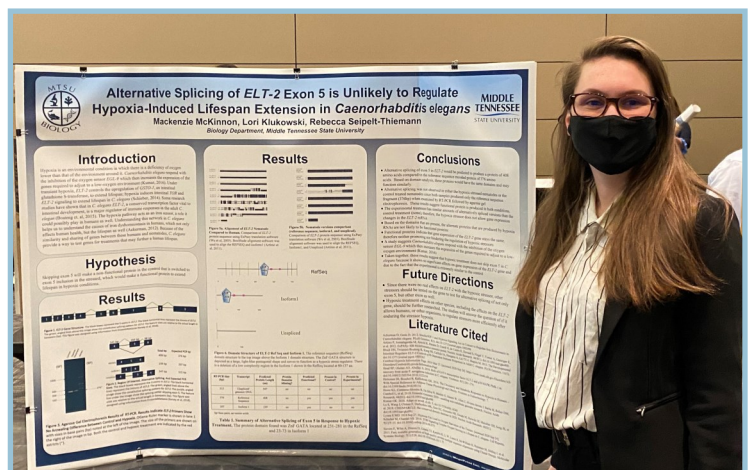
Mariana De Araujo Bryan, undergraduate BIOL, **Thippaphone Niravong**, undergraduate BIOL, **Laine Matthews**, undergraduate CHEM, **M. Elizabeth Barnes**, Biology; "Exploring Undergraduate Biology Students' Attitudes and Science Communication about COVID19 and COVID19 Vaccines"



Deborah Nwadibie, graduate student BIOL, **Jeffrey Leblond**, Biology; "MONO- AND DIGALACTOSYLDI-ACYLGLYCEROL COMPOSITION OF *Pedinomonas minor*, *Pedinomonas sp.*, *Pyramimonas parkae*, *Pyramimonas obovata*: A QUEST TO RECONCILE THESE SECONDARY PLASTID ANCESTORS OF THE DINOFLAGELLATE *Lepidodinium chlorophorum* AND EUGLENID *Euglena gracilis*."

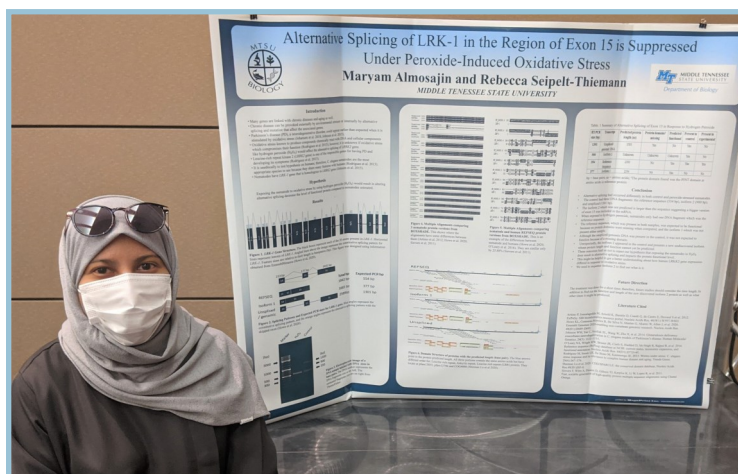


Kwinci Britt, undergraduate BIOL, **Mary B. Farone**, Biology, **Anthony L. Farone**, Biology; "How the Infection Rate of *Candidatus Berkiella cookevillensis* can Provide Explanations for Disease Transmission"

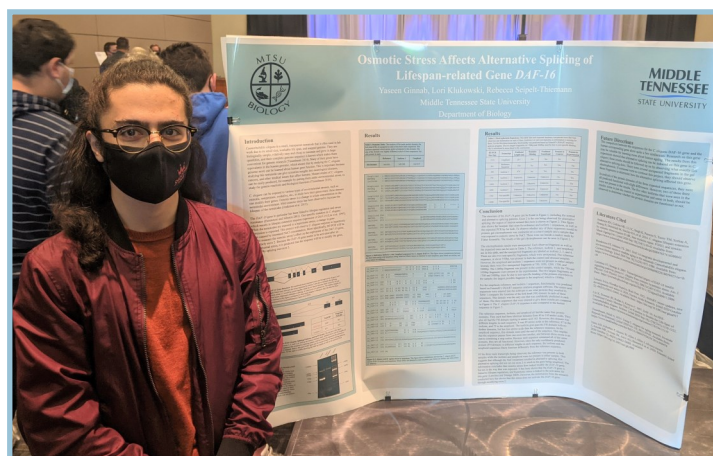


Mackenzie McKinnon, undergraduate BIOL, **Lori Klukowski**, graduate student MSE, **Rebecca Seipelt-Thiemann**, Biology; "Alternative Splicing of *ELT-2* Exon 5 is Unlikely to Regulate Hypoxia-Induced Lifespan Extension in *Caenorhabditis elegans*"

University-Wide Scholars Week Poster & Creative Activity Exposition



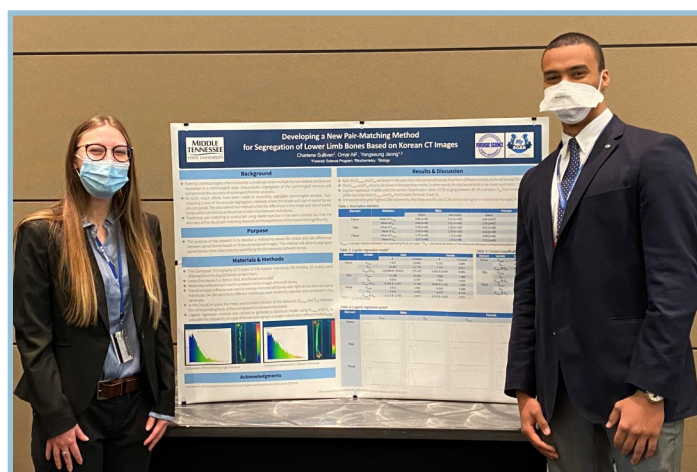
Maryam Almosajin, undergraduate, BIOL, **Rebecca Seipelt-Thiemann**, Biology; "Alternative Splicing of LRK-1 in the Region of Exon 15 is Suppressed Under Peroxide-Induced Oxidative Stress"



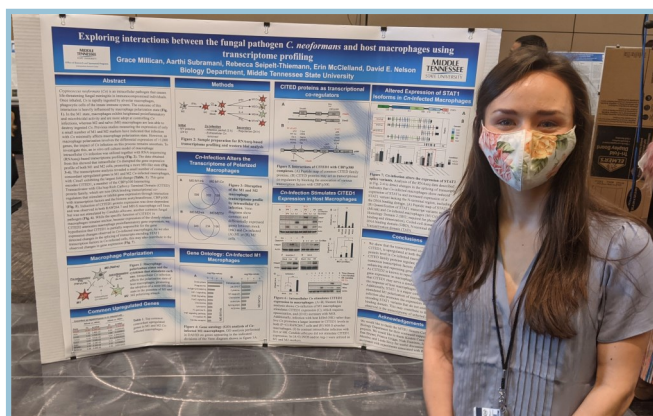
Yaseen Ginnab, undergraduate BIOL/PSY; **Lori Klukowski**, graduate MSE, **Rebecca Seipelt-Thiemann**, Biology; "Osmotic Stress Affects Alternative Splicing of Lifespan-related Gene *DAF-16*"



Madeline Aadnes, undergraduate BIOL, **Aaron Gatewood**, undergraduate BIOL, **M. Elizabeth Barnes**, Biology; "Does teaching the scientific consensus about climate change really lead to higher acceptance of and concern about climate change?"

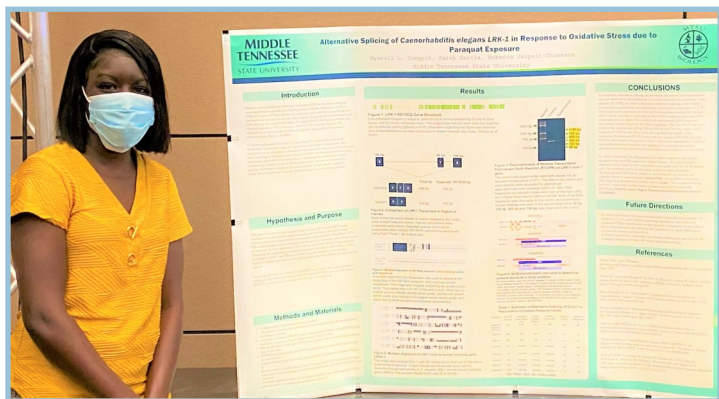


Charlene Sullivan, undergraduate FRSC, **Omar Ali**, undergraduate BIOL, **Yangseung Jeong**, Biology; "Developing a New Pair-Matching Method for Segregation of Lower Limb Bones Based on Korean CT Images"

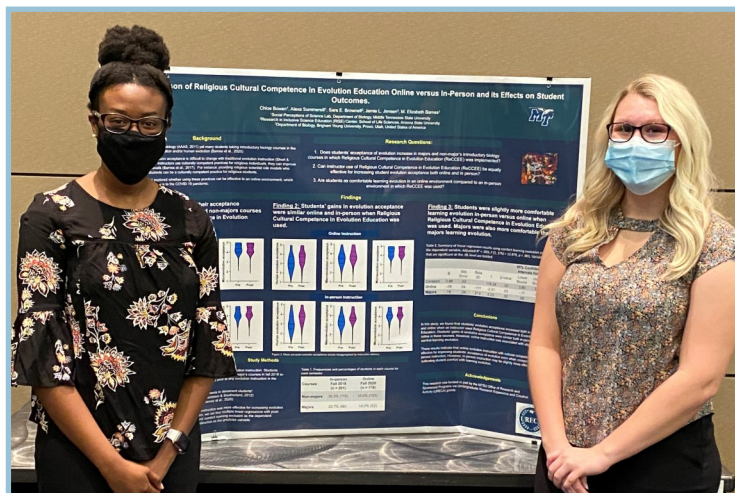


Grace Millican, undergraduate CHEM, **Aarthi Subramani**, graduate MOBI, **Rebecca Seipelt-Thiemann**, Biology, **Erin McClelland**, **David E. Nelson**, Biology; "Exploring interactions between the fungal pathogen *C. neoformans* and host macrophages using transcriptome profiling"

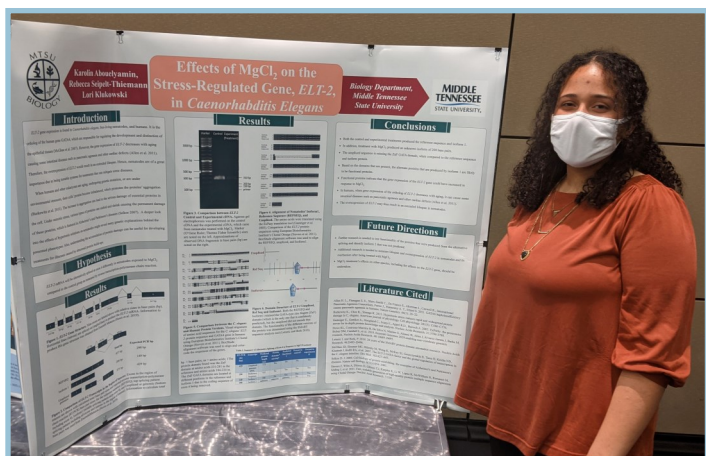
University-Wide Scholars Week Poster & Creative Activity Exposition



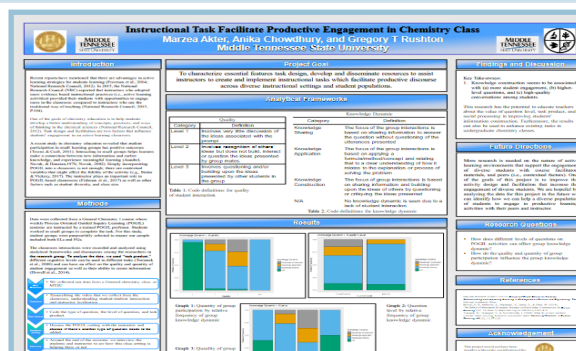
Nyatuil Tongyik, undergraduate BIOL, **Sarah Garcia**, graduate BIOL, **Rebecca Seipelt-Thiemann**, Biology; "Alternative Splicing of *Caenorhabditis elegans* LRK-1 in Response to Oxidative Stress due to Paraquat Exposure"



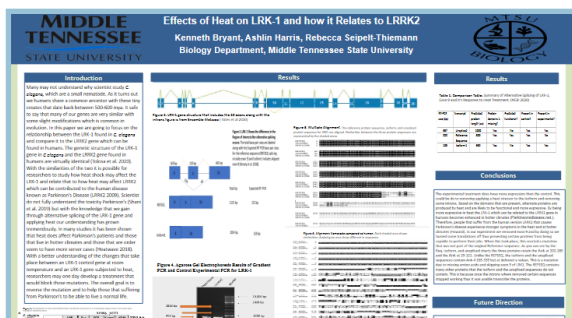
Chloe Bowen, undergraduate BIOL, **Alexa Summersill**, undergraduate PSY, **Sara E. Brownell**, **Jamie L. Jensen**, **M. Elizabeth Barnes**, Biology; "A Comparison of Religious Cultural Competence in Evolution Education Online versus In-Person and its Effects on Student Outcomes."



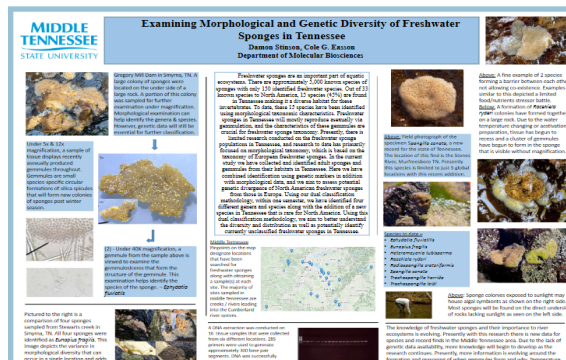
Karolin Abouelyamin, undergraduate BIOL, **Lori Klukowski**, graduate student MSE, **Rebecca Seipelt-Thiemann**, Biology; "Effects of $MgCl_2$ on the Stress-Regulated Gene, *ELT-2*, in *Caenorhabditis Elegans*"



Marzea Akter, undergraduate BIOL, **Anika Chowdhury**, undergraduate BIOL, **Gregory Rush-ton**, TSEC; "Instructional Task Facilitate Productive Engagement in Chemistry Class"

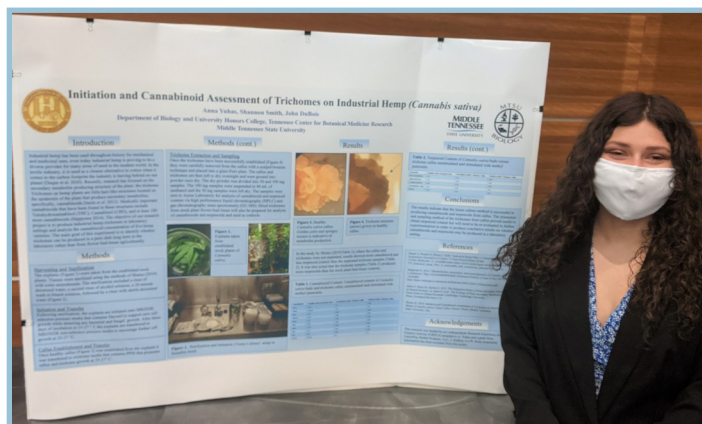


Kenneth Bryant, undergraduate FRSC, **Ashlin Harris**, graduate student COMS, **Rebecca Seipelt-Thiemann** Biology; "The Splicing of LRK-1 Exon 9 and the Effects of Heat Stressors in Relations to LRRK2"

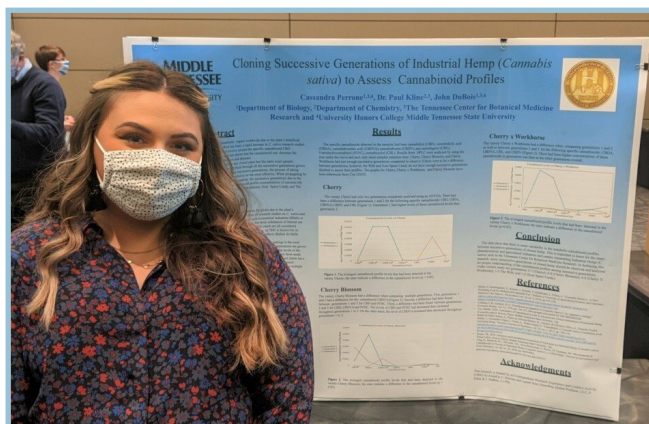


Damon Stinson, undergraduate BIOL, **Cole Easson**, Biology; "Examining Morphological and Genetic Diversity of Freshwater Sponges in Tennessee"

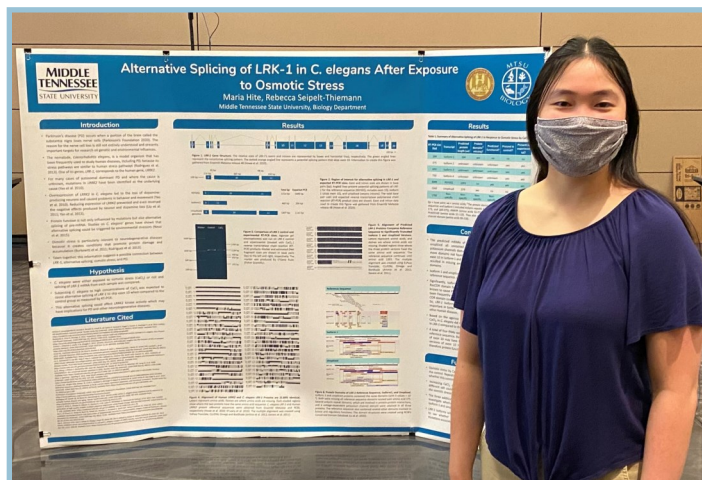
University-Wide Scholars Week Poster & Creative Activity Exposition



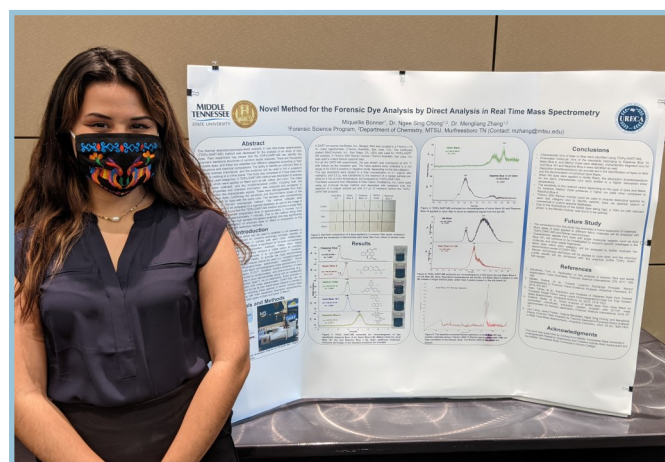
Anna Yuhas, undergraduate FRSC, **Shannon Smith**, graduate student MOBI, **John DuBois**, Biology; Initiation and Cannabinoid Assessment of Trichomes on Industrial Hemp (*Cannabis sativa*)



Cassandra Perrone, undergraduate FRSC, **Paul Line**, CHEM, **John DuBois**, BIOL; "Cloning Successive Generations of Industrial Hemp (*Cannabis sativa*) to Assess Cannabinoid Profiles"



Maria Hite, undergraduate CHEM, **Rebecca Seipelt-Thiemann**, Biology; "Alternative Splicing of *LRK-1* in *C. elegans* After Exposure to Osmotic Stress"



Miquellie Bonner, undergraduate, FRSC, **Mengliang Zhang**, CHEM, **Ngee Sing Chong**, CHEM; "Novel Method for the Forensic Dye Analysis by Direct Analysis in Real Time Mass Spectrometry"



**SCHOLARS
WEEK 2021**

Student Recognition

CBAS Graduate Research Showcase

On February 5th 2021, the **CBAS Research Committee** held a virtual event showcasing the diversity of research endeavors across the graduate program. CBAS graduate scholars, one from each department, were offered the opportunity to present their research. Representing the Department of Biology were **Matthew Grisnik**, Ph.D. candidate and **J. Ashton Reece**, M.S. candidate.



The Cutaneous Microbiota of Bats Has In Vitro Antifungal Activity Against the White Nose Pathogen—**Matthew Grisnik (MOBI)**



Bacterial-Fungal Interactions Affect the Physiology of the Causative Agent of White Nose Syndrome, *Pseudogymnoascus destructans* - **Ashton Reece (BIOL)**

Undergraduate Awards

Emily Oppmann—Provost's Award

The Provost's Award is given to a student who best demonstrates outstanding academic achievement through involvement in scholarly activities.

Denise Ortega—Barry Goldwater Scholarship and DAAD Rise Award

The Scholarship Program honoring Senator Barry Goldwater was designed to foster and encourage outstanding students to pursue research careers in the fields of the natural sciences, engineering, and mathematics. The Goldwater Scholarship is the preeminent undergraduate award of its type in these fields.

The DAAD Rise Scholarship is Germany's premier scholarship program and awards competitive merit-based grants for use toward study and/or research in Germany at any of the accredited German institutions of higher education. Annually, the program offers about 300 grants to undergraduate students from North America, Great Britain and Ireland.

2021 Biology Scholarship Recipients

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

Cynthia Chappell Summer Stipend: Awarded to support research efforts.

Delaney Therrien

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

Khadijah Alnassari

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

Niah Frantzen

Christian Sliger

Jessica Olson

Kevin Driver Memorial Biology Scholarship: Awarded to support research efforts.

Sierra Cruz

Mary C. Dunn Summer Stipend: Awarded to support research efforts.

Alexis Hamous

Ashton Reece

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

Bo Womack

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

Clinton Warren

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

Dylan Favazza

Shadrach Ofoegbu

Thippaphone Niravong

Jim Kemp Biology Scholarship: Awarded to a biology major or minor who is also minoring in secondary education.

Hannah Erdle

Jack Maxwell

Sarah Kerr

Kashyap Trivedi

Travis Lawson

Mitchell Magid Memorial Work Scholarship: Awarded to support research efforts.

Karolin Abouelyamin

Brionna Cunningham

Charles McGhee Summer Stipend: Awarded to support research efforts.

Alexis Hamous

Clinton Warren

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

Alexis Hamous

Clinton Warren

Dennis Mullen Scholarship: Awarded to graduate students engaged in research in Vertebrate Biology or Aquatic Ecology.

Clinton Warren

George Murphy Scholarship: Awarded to support research efforts.

Sarah Kerr

J. Gerald Parchment Summer Stipend: Awarded to support research efforts.

Delaney Therrien

John A. Patten Summer Stipend: Awarded to support research efforts.

Clinton Warren

2021 Biology Scholarship Recipients

Mary de los Reyes Biology Scholarship: Awarded to support research efforts.

Catheryn Bolick

Wayne Rosing Biology Scholarship: Awarded to a Biology major of junior standing with a botany emphasis or a minor in Secondary Education.

Sarah Kerr

Jack Maxwell

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

Marzea Akter

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

Jack Maxwell

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

Alexis Hamous

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.

Jessica Robles

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

Samuel Johnson

Incoming Freshman Scholarships 2020-2021

Patrick J. Doyle Freshman Scholarship: Awarded annually to an incoming freshman Biology major.

Kimberly Ann Cox

Megan Crowe

Ellis Rucker Freshman Scholarship: Awarded annually to an incoming freshman Biology major.

Kimberly Ann Cox

Megan Crowe

Outstanding Students

Clay M. Chandler Outstanding Freshman Biology Award and Scholarship: Awarded to an outstanding freshman Biology major.

Aaron Gatewood

Khadijah Alnassari

Ralph E. Sharp Outstanding Sophomore Award and Scholarship: Awarded to a Biology major of sophomore standing based on academic performance.

Sydney Ferguson

Brionna Cunningham

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

Caytlyn Marland

Molly Gilliland

Peter I. Karl Outstanding Senior Award: Awarded to the outstanding senior(s).

Catheryn Bolick

Let us hear from you . . .

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

Send us your name, MTSU degree/year, and an update of your professional/career activities, awards, 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

Department of Biology, MTSU Box 60, Murfreesboro, TN 37132 Email: biology@mtsu.edu

