



Dennis Mullen

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## *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, I am happy to report that departmental activities have returned to pre-pandemic levels. Classes and labs were fully on ground this last year and the research labs are bustling. We learned a lot these last two years and some of those lessons will stick with us. We learned that we can offer quality remote instruction if necessary and we are now offering a few remote sections of some of our lecture classes.

Biology faculty and students were very active in research this last year. They published 40 peer reviewed manuscripts (with 32 student co-authorships) and gave 56 presentations at regional/national conferences. Thirty two biology students presented their research at this years Scholars Week Celebration. You can see a list of presenters and winners later in this edition. Biology faculty earned over \$1,700,000 in externally funded grants this last year.

I am proud that the following faculty have been recognized for their excellence in teaching and research: Dr. Kim Sadler received the Outstanding Teaching in General Education Award, Dr. Yangseung Jeong received the Ellis R. Kerley Research Award from the Ellis R. Kerley Forensic Sciences Foundation for outstanding contribution to the field of forensic anthropology and Dr. Liz Barnes received the Evolution Education Award from NABT for her contributions to the field of science education.

This year we welcomed Dr. Kiel Ormerod to our department. Kiel is a neurologist that studies the physiological underpinnings of neuromodulation. He joins us from the Massachusetts Institute of Technology and will be teaching classes in Neurobiology, General Physiology and Anatomy and Physiology. You can read more about Kiel later in this edition.

Be sure check the Biology webpage (<https://mtsu.edu/biology/index.php>) for up-to-date news and follow us on Twitter and Facebook.



# New Faculty

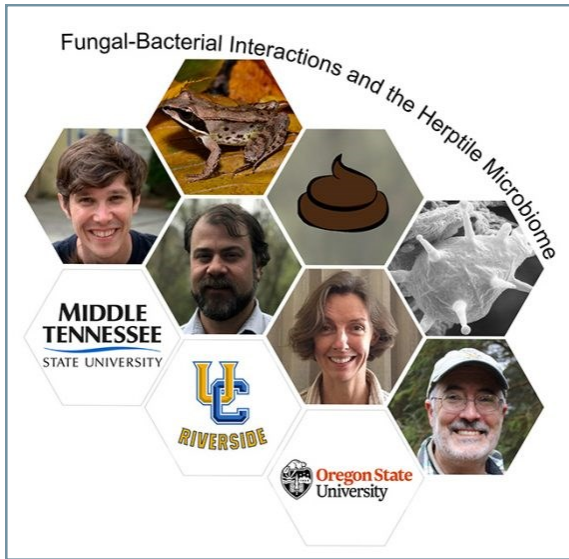
**Kiel Ormerod** joined the Biology department as an Assistant Professor in August 2021. He received his Ph.D. from Brock University and conducted his postdoctoral research training at the Picower Institute for Learning and Memory at the Massachusetts Institute of Technology. Dr. Ormerod's research explores the physiological underpinnings of neuromodulation using fruit flies, *Drosophila melanogaster*, as a model organism. His research takes a multi-facet approach to explore multiple areas of physiology, starting at the most molecular. He and his team exploit modern microscopy (ex. spinning disc confocal), and molecular approaches to examine how neuromodulatory substances and (ex. serotonin, GABA, dopamine) and their receptors are made, packaged, transported, and released from cells. Using genetic (CRISPR) and molecular approaches we alter candidate genes to reveal their function in critical cellular pathways and ultimately hope to uncover how alterations and mutations in neuromodulatory signaling leads to disorder and disease. We also use many different approaches to characterize and explore neuromodulators on broader physiological processes like cellular communication, muscle contraction, locomotion, and ultimately on behavior generally.



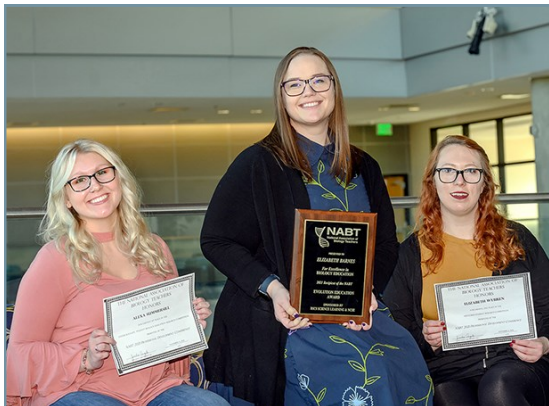
Dr. Ormerod has established an enthusiastic and talented team of undergraduate researchers in his lab to explore the physiological processes underlying neuromodulation, and to uncover the underlying causes of malfunction and diseases when these neuromodulatory pathways breakdown.



## In the News...



MTSU biology professor awarded \$870K in National Science Foundation grant



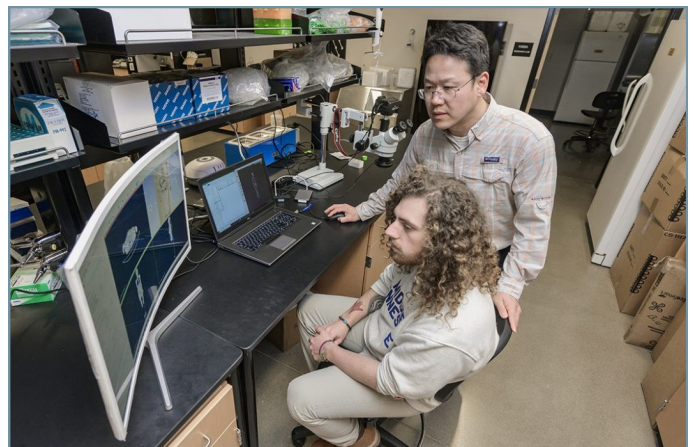
MTSU professor, and students honored by National Association of Biology Teachers



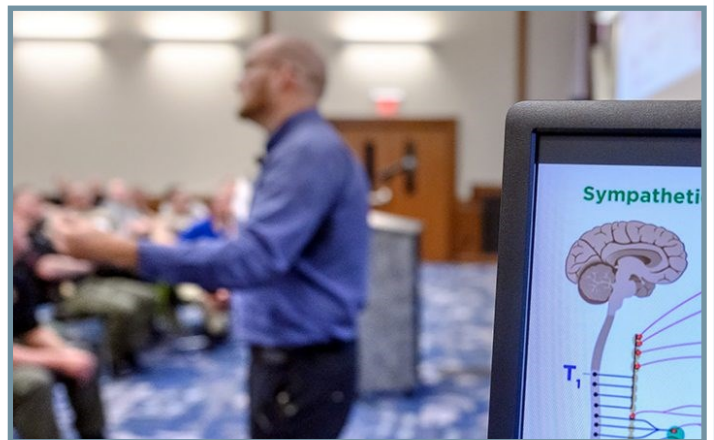
Professor's \$272K grant helps MTSU students soak up sponge research in Florida Keys



With \$6,500 stipend, MTSU biology researcher, student tackle Stones River Watershed diversity



MTSU's Jeong receives national Kerley Award for forensic anthropology research



MTSU Forensic Science partners with state agencies to host refresher for 100 state drug recognition experts

## In the News...



[MTSU alumni, mentor find international acclaim from spider research](#)

## Biology Lab Updates

### From the lab of Liz Barnes

I went to a conference [NABT](#) with two of my undergrad students. I was attending to accept an award for my research and my undergrads also ended up winning two awards for their poster presentations! Here is an MTSU write up for details <https://mtsunews.com/biology-barnes-students-awards-dec2021/>.

Also, Michael Rutledge and I published a manuscript together in the top journal of our field, in which I collaborated with Michael to revise an instrument he created for evolution education researchers over 20 years ago: <https://www.lifescied.org/doi/10.1187/cbe.21-05-0127>

Finally, two of my undergraduate researchers were finalists at the annual American Association for the Advancement of Science (AAAS) meeting poster competition and out of more than 180 poster submissions, they received honorable mention (second place) for their poster presentations in their respective categories! ([Chloe Bowen and Mariana de Araujo Bryan](#))

<https://aaas.confex.com/aaas/2022/meetingapp.cgi/Paper/30071>

<https://aaas.confex.com/aaas/2022/meetingapp.cgi/Paper/30130>



# Biology Lab Updates

## From the lab of April Weissmiller

Dr. Weissmiller has been awarded two lines of research funding over the past year to study different rare pediatric cancers. One of these is a NIH/NCI R15 award to study neuroblastoma and the other is a Rally Foundation for Childhood Cancer Research Young Investigator Award to study malignant rhabdoid tumor. In addition, the Weissmiller laboratory published "Multiple interactions of the onco-protein transcription factor MYC with the SWI/SNF chromatin remodeler" in *Oncogene* less than a year ago.

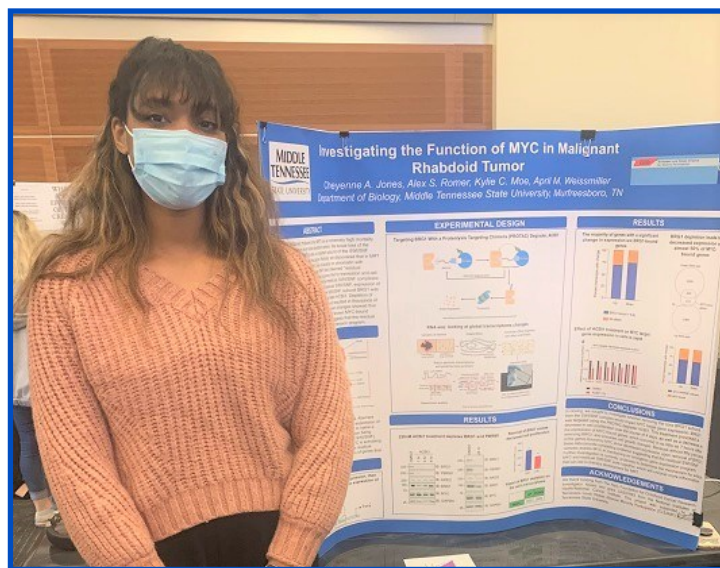
The Weissmiller laboratory welcomes **Michael Swaenepoel** as a new Ph.D. student and **Leigh Bumpous** as a new Masters student. Both Michael and Leigh will be working on understanding how MYC uses co-factor interactions to drive N-MYC amplified neuroblastoma.

### Undergraduate News in the past year

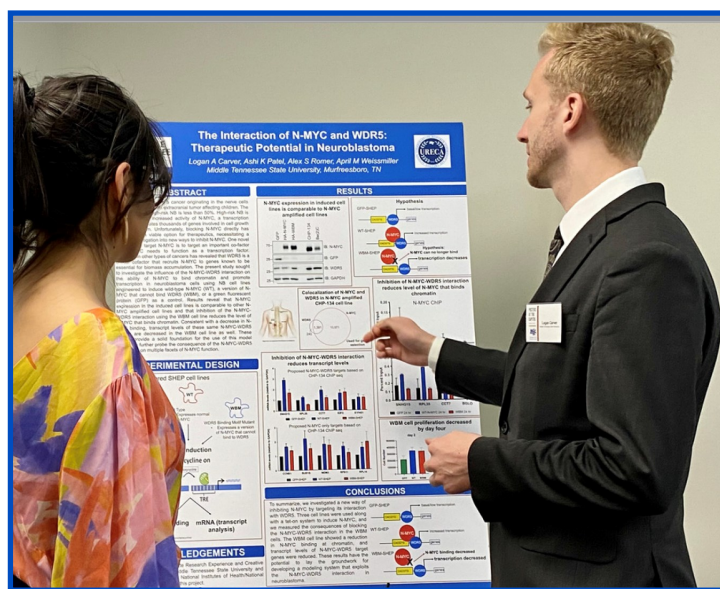
**Jack Maxwell** became first undergraduate in the Weissmiller laboratory to graduate from MTSU! During his time in the lab, he obtained one Silver and one Platinum Undergraduate Research Experience and Creative Activity (URECA) research award, three Department of Biology scholarships, performed a summer internship with collaborators at Vanderbilt University, and was a co-author on the work that was published in *Oncogene*.

**Ashi Patel** will be defending her Honors Thesis this semester! In her time in the Weissmiller laboratory, she has received an Assistant URECA research award and has presented her research at MTSU Fall Research Open House and MTSU Scholars week.

**Jesse Scobee** is the newest undergraduate to the Weissmiller laboratory and is a US Armed Forces Veteran. Since joining, he has been awarded a Silver URECA grant for his research project was recently awarded the June Anderson Center Nontraditional Student of the Year.



**Cheyenne Jones** has presented her research work at MTSU Scholars Week and at the Tennessee Louis Stokes Alliance for Minority Participation Annual Conference. Cheyenne has also been accepted into summer research training program (SRTP) at University of California San Francisco (UCSF). SRTP provides \$5,000 stipend, travel support, and paid housing over the summer. She will be leaving for UCSF towards the end of May for a 10-week intensive research experience. Have so much fun Cheyenne!



**Logan Carver** was awarded a Platinum URECA award for the summer work he performed in the Weissmiller laboratory. He has presented his at the MTSU Fall Research Open House and at the prestigious Posters for the Capitol.

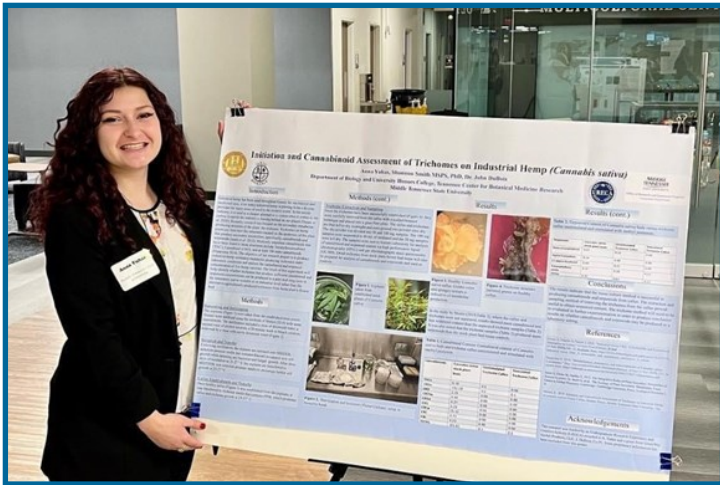
# Biology Lab Updates

## From the lab of John DuBois

### Poster Presentations:

Tennessee Collegiate Honors Council Conference, East Tennessee State University,  
February 11-12, 2022

Website: <https://www.etsu.edu/honors/tchc2022.php>



**Yuhas A, Smith S, DuBois J.** 2022. Initiation and cannabinoid assessment of trichomes on industrial hemp (*Cannabis sativa*).



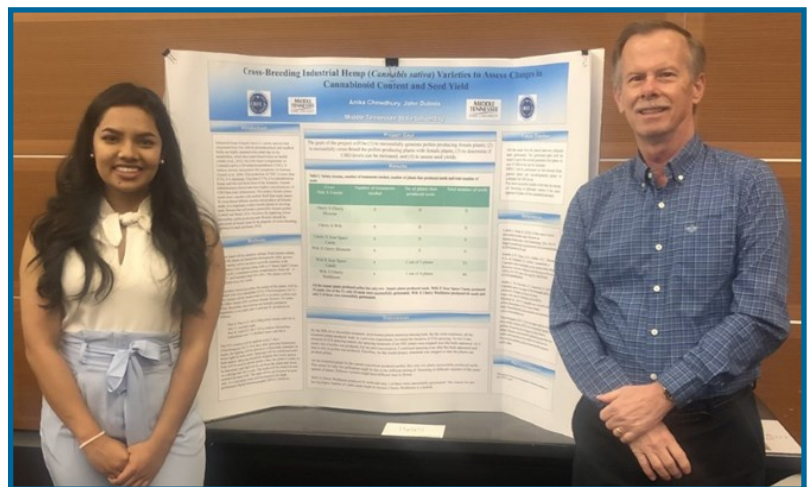
**Perrone C, Kline P, DuBois J.** 2022. Cloning successive generations of industrial hemp (*Cannabis sativa*) to assess cannabinoid profiles.

CBAS Scholars Week, March 22, 2022

MTSU Scholars Week Posters March 25, 2022



**Garris S, DuBois J.** 2022. Comparison of media components for somatic embryogenesis in tissue callus of *Vitis aestivalis* 'Norton, Cynthiana.'



**Chowdhuri A, DuBois J.** 2022. Cross-Breeding Industrial Hemp (*Cannabis sativa*) Varieties to Assess Changes in Cannabinoid Content and Seed Yield.

# Biology Lab Updates

## From the lab of John DuBois

### National Conference on Undergraduate Research, Virtual April 4-8, 2022.

**Perrone C, Kline P, DuBois J.** 2022. Cloning successive generations of industrial hemp (*Cannabis sativa*) to assess cannabinoid profiles.

**Garris S, DuBois J.** 2022. Comparison of media components for somatic embryogenesis in tissue callus of *Vitis aestivalis* 'Norton, Cynthiana.'

**Yuhas A, Smith S, DuBois J.** 2022. Initiation and cannabinoid assessment of trichomes on industrial hemp (*Cannabis sativa*).

### Honors Thesis Defenses over the past year:

#### Fall 2021:

**Garris, S.** 2021. Comparison of Media Components for Somatic Embryogenesis in Tissue Callus of *Vitis aestivalis* 'Norton/Cynthiana.' 27p.

#### Spring 2022:

**Hedden, Christopher.** 2022. Using Industrial Hemp Tissue Callus for Somatic Embryogenesis. 15p.

**Lawwell, Savannah.** 2022. Producing Pollen, Pollination and Assessment of Seed Yields in Feminized Industrial Hemp (*Cannabis sativa*). 25p.

**Yuhas, Anna.** 2022. Initiation and Cannabinoid and Terpenoid Assessment of Trichomes on Industrial Hemp (*Cannabis sativa*). 23p.

**Perrone, Cassandra.** 2022. Cloning Successive Generations of Industrial Hemp (*Cannabis sativa*) to Assess Cannabinoid Profiles. 55p.

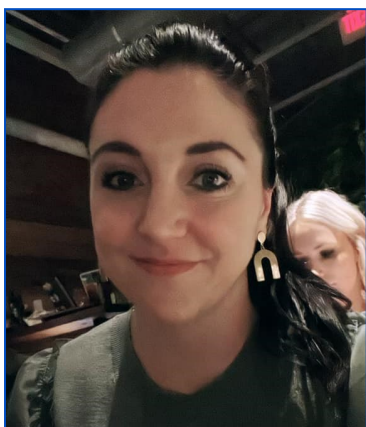
**Chowdhuri, Anika.** 2022. Cross-Breeding Industrial Hemp (*Cannabis sativa*) Varieties to Assess Changes in Cannabinoid Content and Seed Yield. 12p.

# Biology Lab Updates

## From the lab of Kim Sadler

Here are updates from two students, one of them most of you will remember well because she worked in the biology office, Rachel Lytle, MS. Patrick Phoebus, PhD, worked closely with Drs. Mary and Tony Farone and me for several years with the TRIAD gk-12 project and he developed the virtual arboretum tour at MTSU.

From Rachel: I am now teaching honors and AP biology at Brentwood High School and serve as co-chair of the science department. I've been active within the college board community as one of seven teachers selected that produced videos teaching topics for AP classroom, now available to all AP biology students globally. This summer will be my fourth year serving as a reader for the AP exam, scoring essays that determine students' scores. I was hired as a lead speaker for A+ Alabama to lead two days of tips and strategies for teaching AP biology, and I am the current secretary for the TN association of biology teachers. I now coach the Brentwood High School JV cheerleading team who placed first at nationals this year. I always speak highly of my MTSU experience and have had several students choose MTSU biology as their next step in their education.



From Patrick: I have continued my career with Metro Nashville Public Schools (20 years now), where I currently provide high-quality biology education to our most at-risk population of students.

In addition, I serve as an adjunct faculty member in the Department of Biological Sciences at Tennessee State University, teaching Anatomy & Physiology. I am also continuing my work on a long-term project cataloguing biological diversity in Shelby Bottoms, a 1,200 acre urban wetland preserve near downtown Nashville.

Some news about me: I'm sharing some advice someone gave me years ago, which was to never say "never." I always said I would never teach online and who knew a pandemic would force all of us into a teaching technological adventure? This spring I taught Exploring Life, BIOL 1030/31-D01 for the first time, with simulation labs. The course was full two days after registration opened, with countless students emailing me with requests to add. I personally never wanted to take an online course but after meeting my students, working fulltime with families, I see the need.

I was surprised, humbled, and honored to receive the Outstanding Teaching in General Education Award for 2020-2021 at the fall 2021 faculty convocation. Students must take 41 hours of general education courses from different six areas, composed of many courses taught by hundreds of instructors; I was proud to represent the Natural Sciences.



# Biology Lab Updates

From the lab of Donald Walker

NSF - 2125067 Spatafora, 2125066 Stajich, 2125065 Walker

## NEW VERSION OF NON-TECHNICAL ABSTRACT

Reptiles and amphibians are among the most threatened species on the planet, and an increasing number of their species must be managed in captive breeding programs. Understanding the biodiversity and function of microbes that are present in the digestive tracts of reptiles and amphibians is critical for insight into their role in host health. Early research suggests that the filamentous fungus *Basidiobolus* is an important member of reptile and amphibian gut microbiomes, and that this fungus influences what types of bacteria are present in the digestive tract. Genomic sequencing of the *Basidiobolus* fungus shows that genes have been transferred to the fungus from the gut bacteria. This transfer of genes between bacteria and fungi results in novel metabolism in the fungus that we propose plays important roles in regulating the reptile/amphibian host's immune system, iron metabolism, and chemical communication with the gut bacteria. An interdisciplinary scientific approach will be used to understand the functional roles that specialized metabolites play in microbial interactions between fungi and bacteria in gut microbiomes of animals and also other natural microbiomes. Outreach activities with zoos and the Great Smoky Mountains National Park will share information about reptile and amphibian gut microbiomes with the general public, and educational material will be provided to educators for inclusion in K-12 and university curricula. Interdisciplinary training of students and postdoctoral researchers to prepare them for careers in research, education, and outreach is central to the project.

## NEW VERSION OF TECHNICAL ABSTRACT

This work will advance a new scientific understanding of the fundamental roles that specialized metabolites play in microbial interactions between fungi and bacteria in gut microbiomes. This will be accomplished through an interdisciplinary approach combining ecology and evolutionary biology, genomics and metagenomics, natural product chemistry, synthetic microbiome experiments, and controlled amphibian feeding trials. Preliminary data reveal that fungi in the genus *Basidiobolus* are dominant members of the herptile microbiome, and that microbial community structure is shaped by the genetic diversity of *Basidiobolus*, which has acquired specialized metabolism through HGT. Integration of biological, molecular, genomic, metagenomic, and chemical resources in the proposed herptile system will allow for tests of the following hypotheses: H1: Herptile microbiomes are characterized by unique fungal communities not found in other nonpathogenic, microbiome systems. H2: The bacterial assemblages of herptile microbiomes are structured by interactions with fungi. H3: HGT from co-occurring bacteria to herptile gut fungi allowed *Basidiobolus* to acquire novel metabolic functions necessary to adapt to, and function in, the herptile microbiome. H4: Fungal-bacterial interactions in herptile GI systems are regulated by metabolites that influence community structure and function. H5: The phenotype of the host-microbiome association is species/context dependent. This work will further refine the general model that the animal gastrointestinal environment promotes HGT between bacteria and fungi, and that this HGT selects for specialized metabolites that modulate the host immune system (cyclic peptides), and allow fungi to function in a reduced oxygen environment and compete in a bacterial rich microbial community (siderophores and surfactins).

# Biology Lab Updates

## From the lab of Donald Walker

The Walker Lab participated in a Zoo Knoxville outreach event that engaged nearly 200 K-8 school children over a two week time. They delivered educational exercises in reptile and amphibian microbiome research.



# Biology Lab Updates

## From the lab of Yangseung Jeong

At the 74th annual meeting of American Academy of Forensic Sciences (AAFS) in February 2022, Dr. Jeong's paper was selected as the best research of the year (Forensic Anthropology section) and received the Ellis R. Kerley Research Award. Three of his former and current students (Charlene Sullivan, Omar Ali, and Marcus Luciano) are listed as co-authors of this paper. In this research, his team developed a new digital pair-matching method to segregate commingled skeletal remains into individuals using CT scan images.

Four undergraduate researchers in Dr. Jeong's lab have received 2022 Spring URECA grants. Leslie Gonzalez, Casey Tomlin, and Marcus Luciano work on the Korean CT data to generate new methods for biological profile reconstruction; Miranda Fain conducts experiments at the MTSU Outdoor Forensic Facility (MOFF) to survey the scavengers in Murfreesboro and analyze the effect of scavenging on the skeletal evidence.

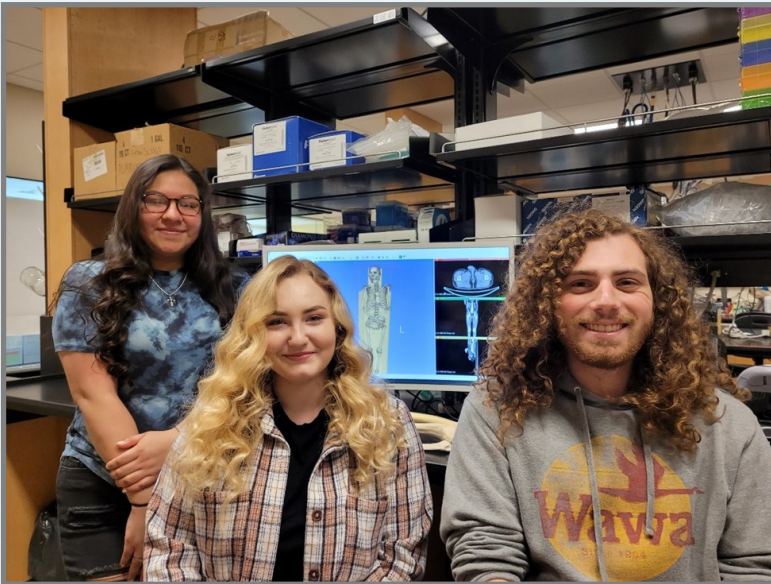


Figure 1. **Leslie Gonzalez** (left), **Casey Tomlin** (middle), and **Marcus Luciano** (right) working on the CT Project.

Figure 2. **Miranda Fain** working on the skeletal trauma caused by animal scavenging.



## Biology Lab Updates

### From the lab of Anthony and Mary Farone

Raj Ghosh, PhD has taken an industry postdoctoral fellowship at Seres Therapeutics, Inc. in Cambridge, MA working on establishing a microbiome for better health. Dr. Tony's current PhD student Dan Bryant is doing amazing work on a novel aurone and its biochemistry for which we have a provisional patent and he has submitted his first, first author manuscript based on this work. Dr. Tony's MS student, Marshall Baughman, worked on a botanical compound from a mango species that demonstrated anti-inflammatory activity and Marshall graduated in December 2021. In addition to his work at Allied Boiler, Inc. in Murfreesboro, he and another Biology alum, Clinton Holladay, have started a non-profit to promote STEM in local schools. Dr. Mary's PhD students, Desta Kidane and Csilla Czepe are doing well. Desta has submitted a first author manuscript describing the intracellular trafficking of the novel genus *Berkiella* CC99 and HT99 bacteria he is studying. Csilla is characterizing the antimicrobial effects of botanical-based compounds. Dr. Mary's new MS student, Trey Borders, is determining if the CC99 bacterium can be transferred between different mammalian tissue culture cell types. Our undergraduate research students are also doing well. Sydney Ferguson has mastered programming our Opentrons pipetting robot and has used it to screen terpenes for anti-inflammatory activity in a macrophage cell line. She is in the process of training Dr. Tony's new honor's thesis student, Shivam Patel, who will be studying the effects of increasing concentrations of dimethylsulfoxide (DMSO) on a human and mouse macrophage cell-line. Dr. Mary's undergraduates, Alyssa Everhart and Deanna Sekulich, are developing growth media for the intracellular bacteria and infection characteristics of the bacteria, respectively. Alyssa will be continuing on as a GTA in the MS program with Dr. Mary and Deanna plans to go to medical school.



Farone Lab (Clockwise from left): Csilla Czepe, Alyssa Everhart, Deanna Sekulich, Mary Farone, Dan Bryant, Tony Farone, Shivam Patel, Desta Kidane, and Trey Borders.

## Kim Sadler's News Center for Cedar Glade Studies



Spring is the best time to enjoy glade wildflowers and each year the CCGS and Cedars of Lebanon State Park host a weekend to celebrate cedar glades.

Weather permitting, hikes and activities led by experts, bring us the natural history of Middle Tennessee. This is the 44<sup>th</sup> year of the event, formerly the Wildflower Pilgrimage, renamed in 2007 to honor Dr. Quarterman, an ecologist at Vanderbilt that studied, along with her students, cedar glades in Middle Tennessee. The Elsie Quarterman Wildflower Festival date will most likely have passed by the time this edition of BioUpdate is posted but just in case, the 2022 dates are: April 29 & 30 at Cedars of Lebanon State Park. Mark your calendar for 2023, May 6 & 7. Visit [www.mtsu.edu/glade-center](http://www.mtsu.edu/glade-center) for more information.

## Center for Environmental Education from Kim Cleary Sadler, Director



The past few years with the pandemic have placed some challenges on the level of activity going on at the CEE but good things are continuing to happen as we move into 2022. Almost

everything the CEE does is a collaborative effort, from partnering with schools and nature centers, working with other departments at MTSU, non-profit organizations, and state agencies. The CEE collaborated with the Center for Human Health Services, Agriscience, and Environmental

Engineering to develop and produce a public education campaign about reducing nutrients in the water supply. My role on the project was to develop, for K-12 and informal science groups, ten interactive lessons and three videos that teach about this issue. A special shout out to Drs. Jessica Arbour, Brian Miller, and Matt Klukowski for assistance with species identification. We are nearing completion of the project and updates will follow next year.

Another interesting project the CEE has been involved in is one that merges art and nature, *Green is the New Blue: Creativity Workshops in Nature*, in collaboration with the MTSU Writing Center's Dr. Amy Whitmore and Arin Anfinson, MTSU art department. These monthly workshops featured artists from a variety of areas and a naturalist collaboration. See photos for a sample of some of the workshops.



Photo: Green is the New Blue: Creativity Workshops in Nature

With Kim Sadler, Naturalist and Erin Anfinson, Artist. Explanation of photo: participants display sketches made at Stones River National Battlefield Cedar Glades, March 2022.

# Biology Updates

## Center for Environmental Education



Photo: Green is the New Blue: Creativity Workshops in Nature with Kim Sadler, Naturalist and Shabz Ujima, Artist. Explanation of photo: Participants learned about the function of trees, examined tree cross-sections, and then through dance modeled the transport of water and nutrients through the trunk of a tree. Pictured here are “roots” with the swath of black cloth the “trunk” and the fireplace is the “sun” at Oakland’s Mansion (30 degrees outside, opted to be inside), February 2022.



Photo: Green is the New Blue: Creativity Workshops in Nature with M. Kelly, Artist. Explanation of photo: Participants used fibers, fabric, and natural materials to create woven sculptures. Kim Sadler displays a woven sculpture from leaves, participants learned about trees at Oaklands, November 2022.

Those of you that are alumni will be pleased to hear the microscopes from biology classes you took 20 to 30 years ago were retired to the CEE microscope loan program when new microscopes were purchased with the 2014 move to the new building. The loan program has continued to benefit hundreds of students in local schools with high-quality microscopes and related materials. There are also retired 3-D models and resource trunks available for loan: Recycling/Green Shopping, Lenses and Light, All about Trees, Let’s Hear it for Herps, Soil Analysis, and others.



If you are on campus you may have noticed the native plants garden in the Science Building courtyard now has a sign posted. The garden was established as a Monarch Waystation in 2018 and was certified this past summer as wildlife habitat. Last spring we received 32 swamp milkweed plants from Monarch Watch, funded by the Natural Resources Defense Council, and more than 30 plants survived through dormancy this winter. The Biology department and the Center for Cedar Glade Study have been supporting the purchase of additional replacement native plants; donations of hardy, sunny habitat, non-spreading, native plant species are always welcome. Volunteers with helping hands are always needed! There is always an on-going battle with unwanted plants and summer help is always needed to water plants just getting established.



The CEE's most active and dedicated volunteer is Dr. Cindi Smith-Walters, retired biology faculty, and her husband Dave Walters. Cindi is a former award-winning Project Learning Tree Educator of the Year and has continued leading workshops that teach participants how to teach about trees through interactive and engaging experiences. She and Dave conducted PLT workshops for Ranger-Naturalists across the state, several Teacher Conservation workshops in Middle and East Tennessee, have done several Tennessee Naturalist Program Forestry workshops, when did they retire?

## Tennessee Amphibian Monitoring Program from TAMP Director, Bob English



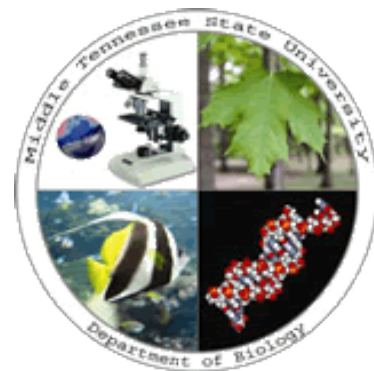
The Tennessee Amphibian Monitoring Program (TAMP) is in a rebuilding year due to the pandemic in 2020 and 2021.

We are tremendously excited that the University of Tennessee in Knoxville is again running their routes this year! This was made possible by the work we have done on the new TAMP website. The new website has everything that volunteers need to learn their frog and toad vocalizations and run a TAMP route. It even includes an online TAMP workshop. The University of Tennessee in Knoxville is using this resource as a teaching tool. The new TAMP website is at <https://leaps.ms/TAMP.htm>.

Dr. Kim Sadler and I authored an article on TAMP in the March/April issue of the *Tennessee Conservationist*. I'm happy to report that this article has created a lot of interest in the TAMP program. As a result of that article, to date we have seven new TAMP volunteers taking routes. We will continue to look for ways to target universities and environmental interest groups in areas of the state where we need coverage and let them know about the new TAMP website.

Some hardy volunteers continued their routes throughout the pandemic and those routes will continue to be monitored. As in previous years, all TAMP data for the 2022 season will be entered into the GIS-based TAMP database.

The integrated database containing all TAMP data from 2004 to 2022 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.



# BIOLOGY STUDENT TRAVEL

**Biology Student Travel was established to support students invited to present their research at local and national conferences.**



**Liz Barnes, Laine Wybren, and Alexa Summersill**

## **Laine Wybren**

### **National Association of Biology Teachers Conference, Atlanta, GA**

**November 11-13, 2021**

The 2021 National Association of Biology Teachers (NABT) conference was held in Atlanta, Georgia from November 11 to November 13. As one of two attending members from the Biology Departments Social Perceptions of Science Lab, I was able to present research to education professionals about how undergraduate biology students perceive and communicate about COVID19 and COVID19 mitigation strategies, including vaccines. The presentation was well-received and was awarded second place in the undergraduate mentored research category. Another member of the lab, Alexa Summersill, was awarded first place for her poster presentation in a separate category. Although neither of us are currently pursuing careers in biology education, I appreciated that the discussions and lectures at the conference emphasized social justice awareness and enhanced communication—both of which will be necessary skills as we complete our academic journeys and begin our respective professions.

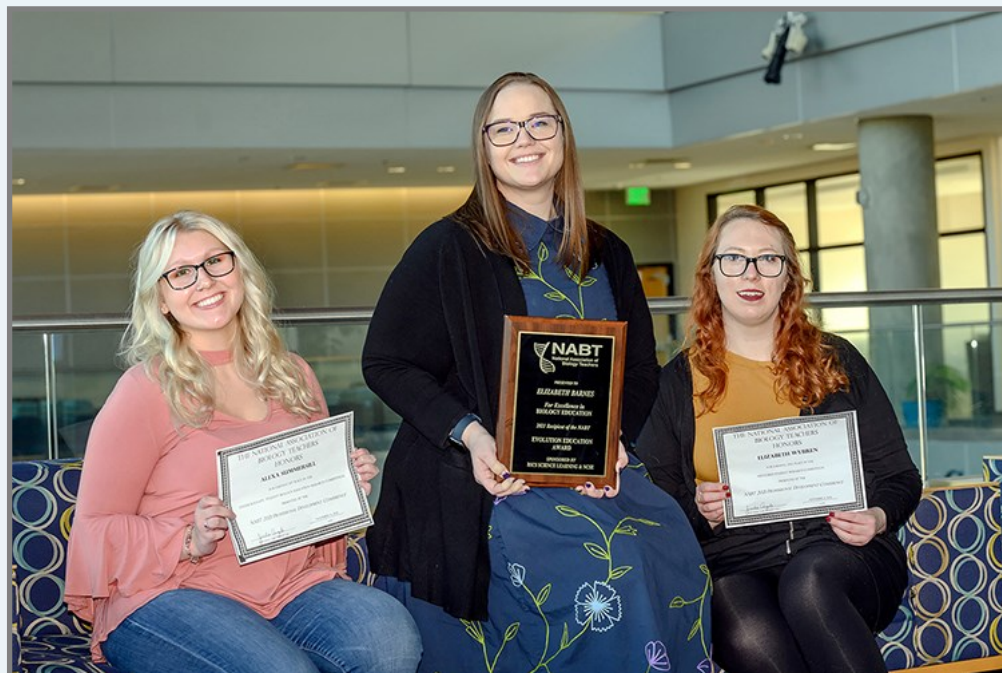
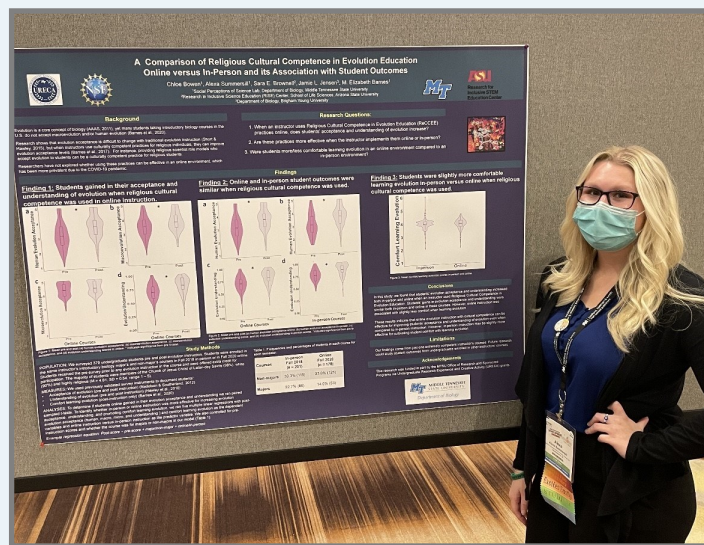
# BIOLOGY STUDENT TRAVEL

**Alexa Summersill**

**National Association of Biology Teachers Conference, Atlanta, GA**

**November 11-13, 2021**

I recently attended the NABT Conference in Atlanta, Georgia to present my team's research poster. It was a fun and educating experience that allowed me to get an inside look into the world of biology education. It was my first conference in-person, so it was a little intimidating at first. However, everyone was very welcoming and excited to see our research. I placed 1<sup>st</sup> in my category of the poster session, which was the undergraduate student biology education research competition. Overall, it was an amazing first conference, and I am thankful I had the opportunity to attend!



**Alexa Summersill, Liz Barnes, and Laine Wybren**

# BIOLOGY STUDENT TRAVEL

Tessa Cote

## 2021 National Conference for Undergraduate Research

Over the last year, Covid-19 has limited and resulted in the cancelation of many important events, and this included the 2020 National Conference for Undergraduate Research. This year, however, the Council on Undergraduate Research overcame Covid-19 related difficulties by hosting their first ever virtual conference. Dubbed “NCUR@Home,” this conference continued the NCUR tradition of giving students the unique opportunity to share their research and engage with professionals in their fields.

The NCUR 2021 was held from April 12-14<sup>th</sup>. Being held on a virtual platform did not limit the wide variety of activities, research exhibits, and educational sessions available to students. During the two-day conference, students had access to several events such as “Skill Builder Sessions”—short programs that assisted students with professional development—and poster and oral presentations where students had the opportunity to engage with peers and discuss their research. Having so many activities (often overlapping) highlighted at least one benefit to holding the conference virtually—nearly all the NCUR events and sessions were recorded. This allowed students to revisit events or sessions they may have otherwise missed during an in-person conference. To encourage social engagement, NCUR’s virtual platform contained a “social wall” which contained live social media posts from attendees sharing their experience at NCUR, and a chat box for attendees to communicate with one another.

Having personally attended NCUR as a presenter, I am very grateful to the Council on Undergraduate research for pushing to hold a conference in spite of the difficult circumstances. Opportunities such as this have greatly assisted me with both my professional development and confidence in conducting and presenting my own research. Virtual or not, there is great benefit to sharing your work with others, and I would encourage my fellow students to consider attending and presenting at future NCUR conferences.

The screenshot shows a virtual presentation interface. At the top right is a red 'LEAVE' button. On the left is an 'Unmute' button. The main content area features a slide titled 'Size Calculations from TEM Imaging'. The slide contains a table with two columns of phage data and a grid of TEM images on the right.

Phage Name	Capsid Diameter (nm)	Tail Length (nm)	Phage Name	Capsid Diameter (nm)	Tail Length (nm)
Vanisius	46	106	Llobrio	40	100
Saximus	60	150	Pulchra	67	144
Solfeggio	60	152	Tapani	45	105
Vesuvius	46	115	Rockwater	52	100
Yeethery	67	106	Manticore	44	100
Magritte	40	NA	Cringle	90	N/A
Pisanello	76	227	Mouvem	69	146
Fectorem	14	32	Destaj	64	140
Baroque	14	30	CW2.1	46	109
Staccato	106	219	CW2.3	50	125
CW2	42	60			

Images from TEM

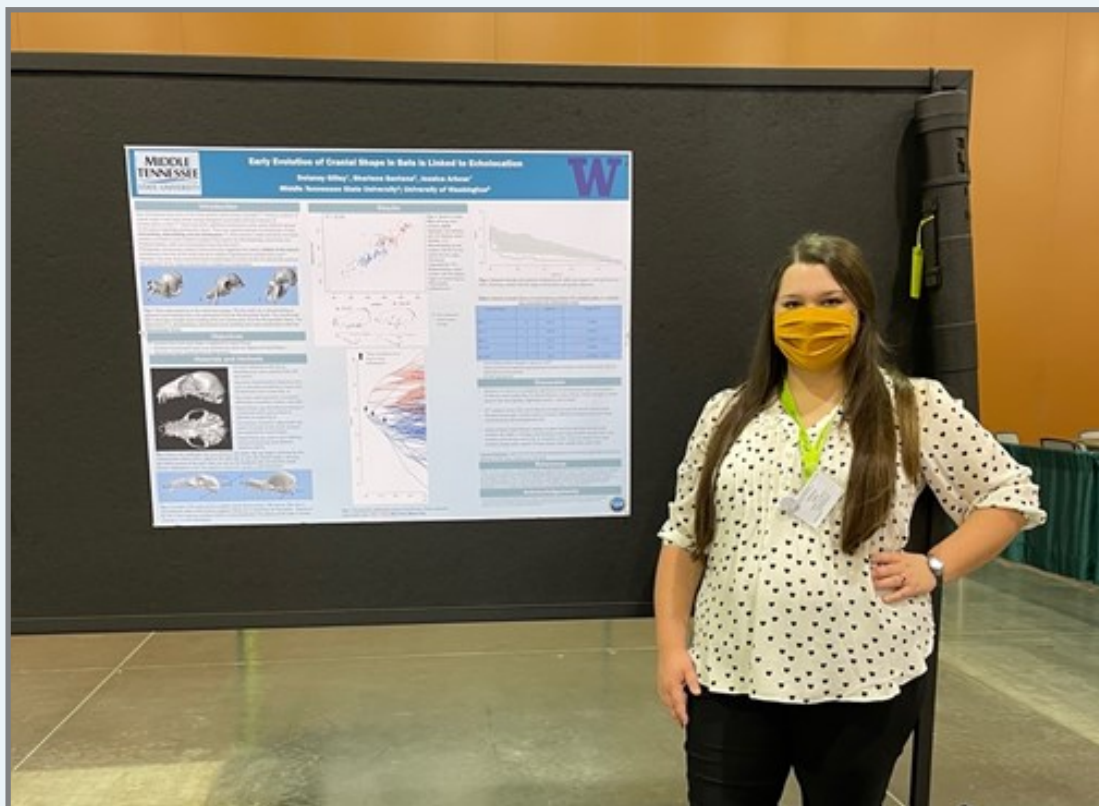
At the bottom of the interface, there is a video feed of a presenter and navigation controls including arrows and buttons labeled 'BH' and 'DL'.

# BIOLOGY STUDENT TRAVEL

**Delaney Gilley**

## **2022 Society of Integrative and Comparative Biology**

I presented a poster of my research at the Society of Integrative and Comparative Biology in Phoenix, AZ. The research presented is on my recent results, the poster is titled, "Early Evolution of Cranial Shape in Bats is Linked to Echolocation". We found rostral flexion (snout upturn or downturn) is of adaptive significance to echolocating types (Oral, Nasal, and Non echolocators) and that this adaptive trait evolved early in the clade's history. I spoke to several individuals in the field and was given advice on different ideas for future directions. Going to this conference allowed me to be exposed to new and upcoming ideas and methodologies in comparative biology and improve on my scientific communication skills.



# BIOLOGY STUDENT TRAVEL

## Luis Zuniga – Field work at Mote Marine Laboratory in Summerland Key, FL

My experience at Mote Marine Laboratory this winter break was an enjoyable one, and I learned a lot. The days consisted of prepping for experiments or sampling from the running experiments. Some days were “boat days” where a group would take the boat out to our reef site. The divers in the group would do “vacuu-sipping” where they used pressurized bottles and tubing to collect exhalant water from a sponge. These days were hard work, especially when we came back to process everything that was collected, but the scenery was always beautiful and refreshing. Through helping the research team, a day wouldn’t go by that I saw something I hadn’t seen before, often getting hands-on experience with various aspects of marine science research. One of the highlights of this research trip was when a manatee approached the boat dock in the middle of the night, and we all got to see it up close! We even turned the water hose on to give the manatee a drink of water, and our marine friend happily took a long drink before resuming his manatee business. Overall, I’m grateful I was able to join Dr. Easson and his collaborators on this research trip, and I hope to join them again in the future for more marine science!



Mote Marine Laboratory and Aquarium  
and a visiting manatee  
Summerland Key, Florida



# BIOLOGY STUDENT TRAVEL

## Jaci Williams: Report for Field Work at Mote Marine Lab in Summerland Key, FL with Dr. Cole Easson

During my time at Mote Marine lab with Dr. Easson and his collaborators, I learned many things that I will carry with me throughout my academic career. I learned that science and experimental design are not static; they can be changed and adapted in a moment. I discovered that we are always learning how to do them better and that good communication is essential. When weather was not on our side for a boat day or one collaborator wanted more treatment types, we had to change the plan to accommodate our new circumstances. Our boat days were incredible. I learned I don't get seasick! I had the opportunity to snorkel on Looe Key reef and it was no less than life changing. I swam with so many beautiful fish I didn't know existed. I learned that I could do a lot more than I thought on three hours of sleep. I was able to experience new lab techniques and processes, like flow cytometry, that are useful in biome and metabolic analyses. Overall, I very much enjoyed my time at Mote with Dr. Easson and his collaborators. I am very grateful to the travel committee for approving the funding that made this trip possible.



Retrieving samples



Kayaking the canal near Mote Marine Laboratory and Aquarium

## Department Graphic Shirts and More

The department is offering 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. 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:	\$30	Stadium Cups:	\$1
	Pull-over hoodie:	\$40	Coffee Mugs:	\$5

All items can be purchased in the department office (SCI 2044)

or by email at [Biology@mtsu.edu](mailto: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 four adjunct faculty members.

These faculty are teaching Exploring Life lectures, General Biology II lectures, Human Anatomy and Physiology I and II labs, Comparative Anatomy of the Vertebrates labs, Radiation Biology, Genetics, Principles of Radiation in Medicine, Ecology labs, Biology Instruction Internship, Invertebrate Zoology lecture and labs, Senior Seminar, and Biometry 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. Cole Easson**, B.S., 2008, University of Mississippi; Ph.D., 2013, University of Mississippi. Teaching: Exploring Life lecture, Genetics lecture and labs, Invertebrate Zoology lecture and labs, and Biometry labs

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

**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. 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

**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. Human Anatomy and Physiology I labs

# Full-Time Temporary and Adjunct Faculty Cont.

## *Adjunct Faculty*

**Mr. James Mendez**, B.S., 2018, Middle Tennessee State University; M.S. 2021, Middle Tennessee State University. Teaching: Human Anatomy and Physiology I 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, Kim Sadler

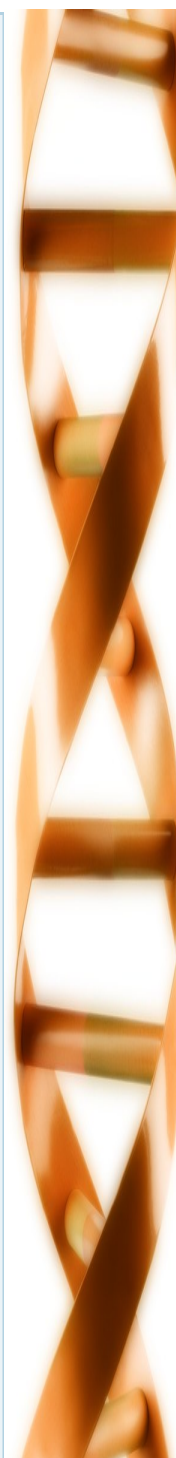
0522-0658 / Middle Tennessee State University does not discriminate against students, employees, or applicants for admission or employment on the basis of race, color, religion, creed, national origin, sex, sexual orientation, gender identity/expression, disability, age, status as a protected veteran, 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; [Christy.Sigler@mtsu.edu](mailto:Christy.Sigler@mtsu.edu); or 615-898-2185. The MTSU policy on non-discrimination can be found at [mtsu.edu/iec](http://mtsu.edu/iec).

# 2021-22 Graduate Teaching Assistants

For the 2021-2022 academic year, the department is providing support to 28 M.S.- level and 10 Ph.D.- level graduate students who serve as graduate teaching assistants (GTAs). Twelve of these students have received undergraduate degrees from colleges and universities other than MTSU. Nine hold baccalaureate degrees in subjects other than biology (animal science, biochemistry, biotechnology engineering, chemistry, liberal arts, microbiology and cell science, neurobiology, Spanish and wildlife fisheries science.) 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

**Aziz Ayad**, B.S., Biochemistry, 2020, Middle Tennessee State University  
**Stephen Borders**, B.S., Biology, 2021, Middle Tennessee State University  
**Sarah Clark**, B.S., Biology, 2021, Middle Tennessee State University  
**Robert Dixon**, B.S., Biology, 2020, Middle Tennessee State University  
**Sarah Garcia**, B.S., Biology, 2020, Middle Tennessee State University  
**Ashley Gereben**, B.S., Biology, 2018, Middle Tennessee State University  
**Delaney Therrien Gilley**, 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  
**McKenna Hunt**, B.S., Biology, 2019, University of Alabama  
**Daniel Knorp**, B.S., Biology, 2019, Middle Tennessee State University  
**Cameron Oldham**, B.S., Biology, 2019, Middle Tennessee State University  
**Rebekkah Riley**, B.S., Biology/Spanish, 2020, Middle Tennessee State University  
**Camyla Rocha**, B.S., Biology, 2020, Middle Tennessee State University  
**Katy Salazar**, B.S., Biology, 2020, Middle Tennessee State University  
**Nicholas Samaha**, B.S. Neurobiology, 2019, University of California, Irvine  
**Natalie Schroth**, B.S., Biology, 2019, Middle Tennessee State University  
**Kittichoti Simakorn**, B.S., Biochemistry, 2020, Middle Tennessee State University  
**Christian Zamian Sliger**, B.S., Biology, 2021, Middle Tennessee State University  
**Jeremy Smith**, B.S., Biology, 2019, Middle Tennessee State University



# 2021-22 Graduate Teaching Assistants

## M.S. Biology Graduate Teaching Assistants

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

**Clinton Warren**, 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

**Emily Zaysongkham**, B.S., Biochemistry, 2019, Middle Tennessee State University

**Luis Zuniga Acuna**, B.S., Biochemistry, 2020, Middle Tennessee State University

## Ph.D. Graduate Teaching Assistants

### Molecular Biosciences Program

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

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

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

**Elena Ivonne Mancera Andrade**, B.S., Biotechnology Engineering, 2014, M.S., Biotechnology, 2018, Institute of Technology and Higher Studies of Monterrey

**Emily Stone**, A.A., 2017, Indian River State College; B.S. Microbiology and Cell Science, 2021, University of Florida

**Michael Swaenepoel**, B.S., Biology, 2017, Western Carolina 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

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

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

# Theses and Dissertations Completed 2020-2021

## Master's Theses

### Summer 2021

**Deborah Ngozi Nwadiobie**, 2021. Lipids of *Pedinomonas minor*, *Pedinomonas* sp., *Pyramimonas parkeae*, *Pyramimonas obovata*: A Quest to Reconcile These Tertiary and Secondary Plastid Ancestors of the Dinoflagellate *Lepidodinium chlorophorum* and Euglenid *Euglena gracilis* (Jeffrey D. Leblond, Mary B. Farone, Rebecca Seipelt-Thiemann—thesis committee)

### Fall 2021

**Marshall Baughman**, 2021. Isolation and Characterization of an Immunomodulatory Compound from a Plant Used in Traditional Chinese Medicine (Anthony L. Farone, Mary B. Farone, Norma K. Dunlap—thesis committee)

### Spring 2022

**Rebekkah Riley**, 2022. Community College Students' Understanding and Perceptions of Evolution (Elizabeth Barnes, Matthew Klukowski, Kim Sadler—thesis committee)

## Doctoral Dissertations

### Fall 2021

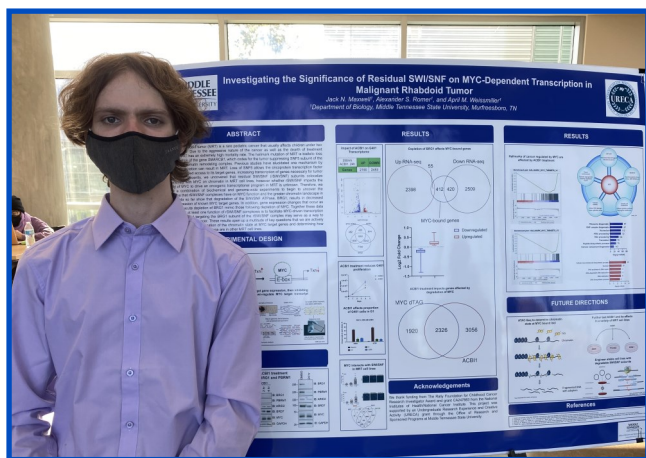
**Fatmah Mohammed Alqahtani**, 2021. Antifungal Assessments, Chemogenomic and Transcriptomic Analyses, and Structure-Activity Relationships of Bioactive Aurone Compounds (Mary B. Farone, Scott T. Handy, Anthony L. Farone, Rebecca L. Seipelt-Thiemann, Paul C. Kline—thesis committee)



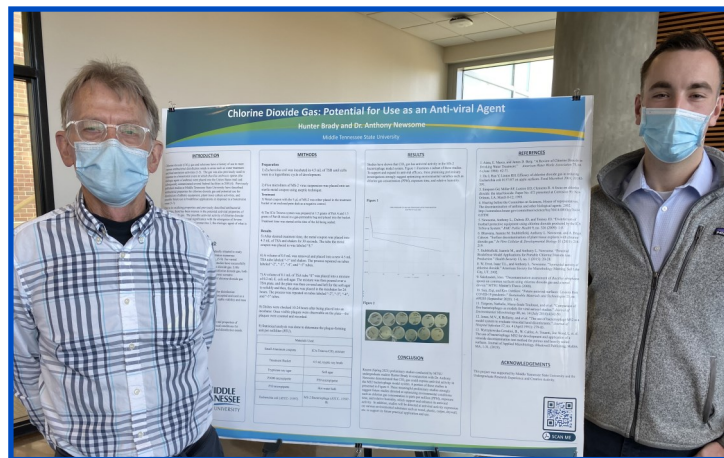
# MTSU Undergraduate Research Center



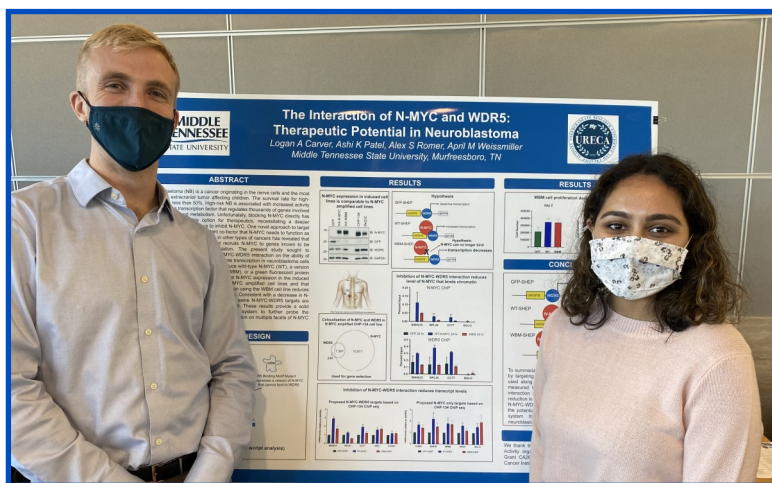
The Fall Research Open House, held 11/4/2021, was an informal poster session that showcased a sampling of current undergraduate student research and creative projects at MTSU. All students, particularly new students and transfer students, were invited to attend. This event was an awesome opportunity 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 and summer URECA grants, and learn about SOAR, the student organization devoted to undergraduate research. And, FREE lunch!



**Jack N. Maxwell, Biology; Dr. April Weissmiller (faculty sponsor) Biology; "Investigating the Significance of SWI/SNF on MYC-dependent Transcription in Malignant Rhabdoid Tumor"**



**Hunter Brady, Biology; Dr. Anthony Newsome (faculty sponsor) Biology; "Chlorine Dioxide Gas: Potential for Use as an Anti-viral Agent"**



**Logan Carver, Psychology, and Ashi Patel, Psychology; Dr. April Weissmiller (faculty sponsor) Biology; "The Interactions of N-MYC and WDR5: Therapeutic Potential in Neuroblastoma"**



# University-Wide Scholars Week Poster & Creative Activity Exposition

## Middle Tennessee State University held the 16th Annual Scholars Week March 21-25, 2022.

Scholars Week is a week long tradition during which MTSU's academic colleges celebrate scholarship, research, and creative activity through a variety of events and activities. The department presented 35 posters. Authors of these posters included 12 faculty members, 6 graduate students, and 25 undergraduate students. Faculty members involved in mentoring these students deserve credit for their time, effort and expertise in these research projects. Many people from across campus saw the quality of research being conducted in the department.

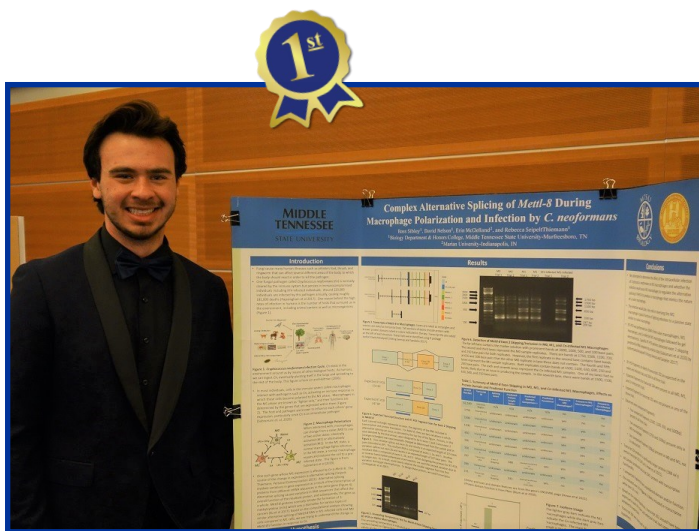
Congratulations to all authors for a job well done!

To see the Scholars Week program, visit <http://www.mtsu.edu/research/scholarsWeek/>.

The following are posters from the Department of Biology.

## CBAS Posters in the Atrium March 22, 2022

Congratulations to the CBAS 2022 Poster Day Competition  
*undergraduate* winning authors and their faculty mentors!



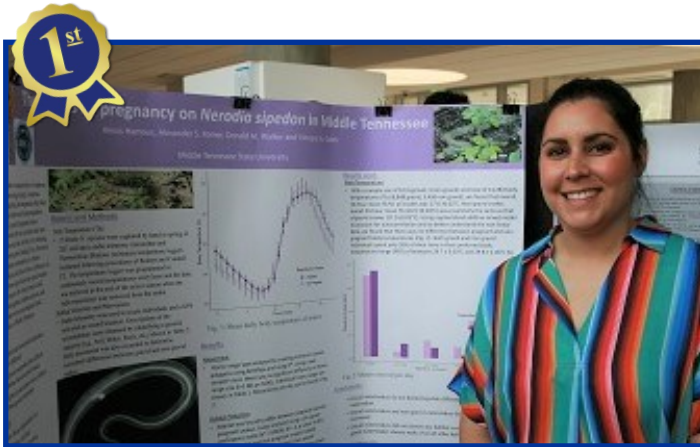
**Ross Sibley**, BIOL undergraduate, **Rebecca Seipelt-Thiemann**, faculty mentor BIOL;  
"Complex Alternative Splicing of Mettl-8 During Macrophage Polarization and Infection by C. neoformans"



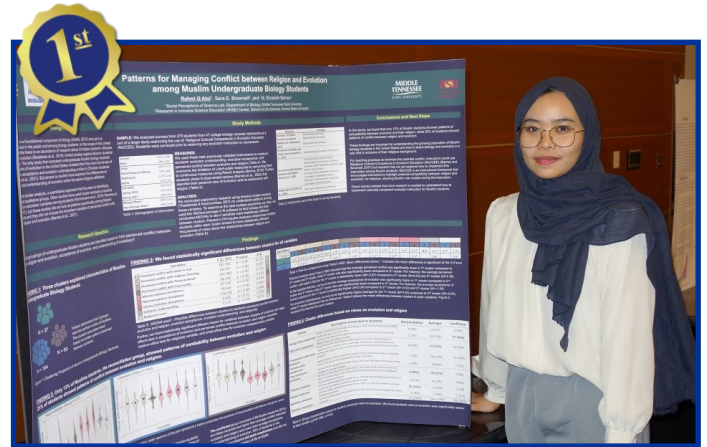
**Chloe Bowen**, Dec. 2021 graduate BIOL, **Alexa Summersill**, PSY undergraduate, **Madeline Aadnes**, BIOL undergraduate, **Laine Matthews**, CHEM undergraduate, **M. Elizabeth Barnes**, faculty mentor BIOL; "Exploring Black Undergraduate Biology Students' Experiences Learning about COVID19 and Communicating about COVID19 to their Communities"

## CBAS Posters in the Atrium March 22, 2022

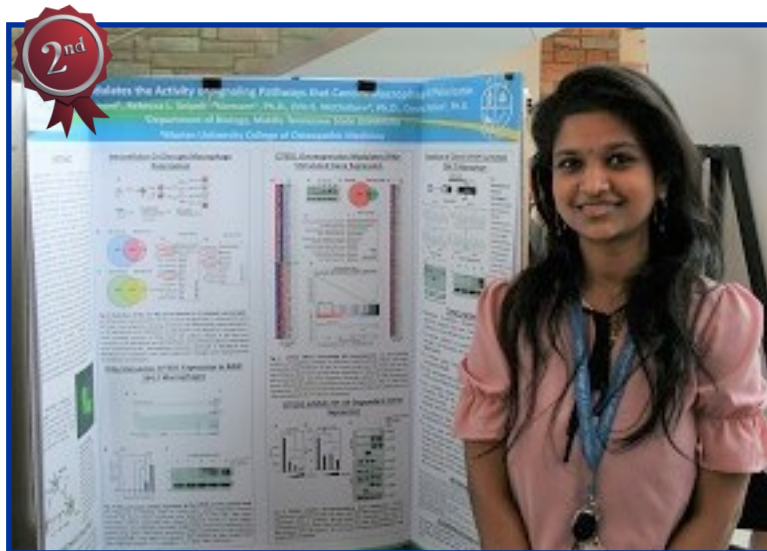
Congratulations to the CBAS 2022 Poster Day Competition  
*graduate—MS and PhD—*winning authors and their faculty mentors!



**Alexis Hamous, BIOL MS , Vincent Cobb,** faculty mentor BIOL; "Gestation site selection and thermoregulation of *Nerodia sipedon* in Middle Tennessee"

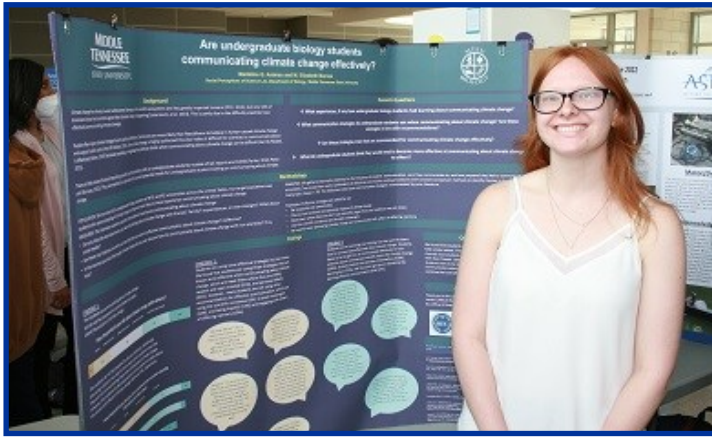


**Rhimi Aini, MSE PhD, M. Elizabeth Barnes,** faculty mentor BIOL; "Patterns for managing conflict between religion and evolution among Muslim undergraduate biology students"

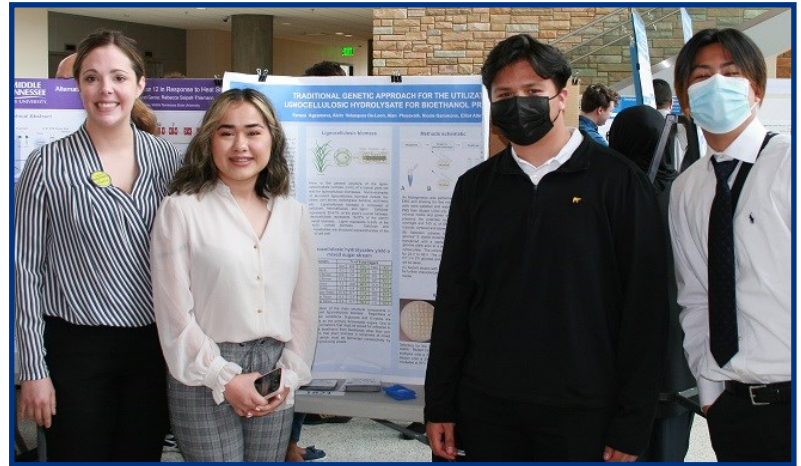


**Aarthi Subramani, MOBI PhD, David E. Nelson,** faculty mentor BIOL; "A Transcriptional Co-regulator, CITED1, as a Putative Inhibitor of IFN $\gamma$ -Stimulated M1 Polarization in Macrophages"

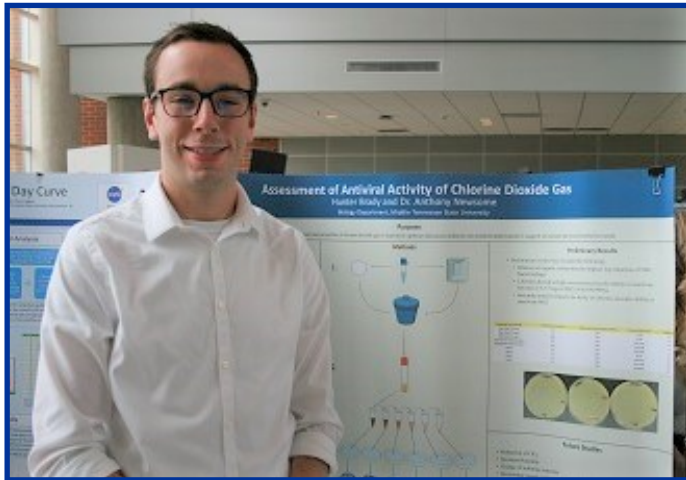
# CBAS Posters in the Atrium March 22, 2022



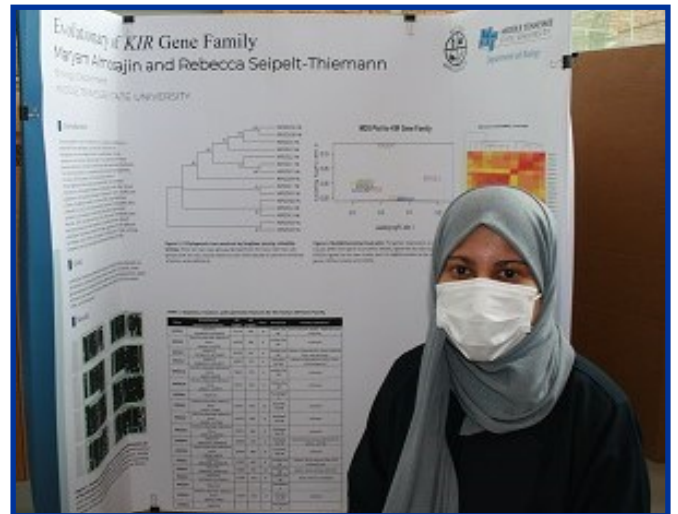
**Madeline Aadnes**, BIOL undergraduate, **Alexa Summersill**, PSY undergraduate, **M. Elizabeth Barnes**, faculty mentor BIOL; "Undergraduate Students' Climate Change Communication Experiences and Training"



**Nicole Gammons**, graduate MOBI, **Feruza Agzamova**, undergraduate BIOL, **Alan Phasavath**, undergraduate BIOL, **Alvin Velasquez De-Leon**, undergraduate BIOL, **Elliot Altman**, faculty mentor BIOL; "Traditional Genetic Approach for the Utilization of Lignocellulosic Hydrolysate for Bioethanol Production"



**Hunter Brady**, BIOL undergraduate, **Anthony Newsome**, faculty mentor BIOL; "Evaluation of the Antiviral Capabilities of Chlorine Dioxide Gas"

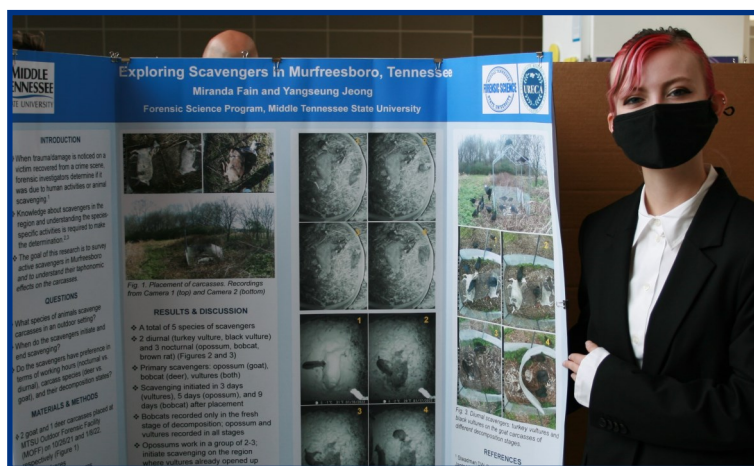


**Maryam Almosajin**, BIOL undergraduate, **Rebecca Seipelt-Thiemann**, faculty mentor BIOL; "Evolutionary of KIR Gene Family"

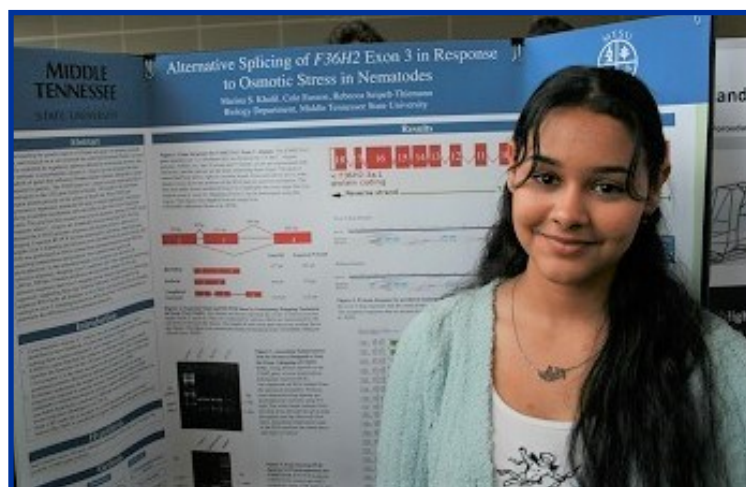


**Sarah Garriss**, BIOL undergraduate, **John DuBois**, faculty mentor BIOL; "Comparison of Media Components for Somatic Embryogenesis in Tissue Culture of Vitis aestivalis 'Norton/Cynthiana'"

# CBAS Posters in the Atrium March 22, 2022



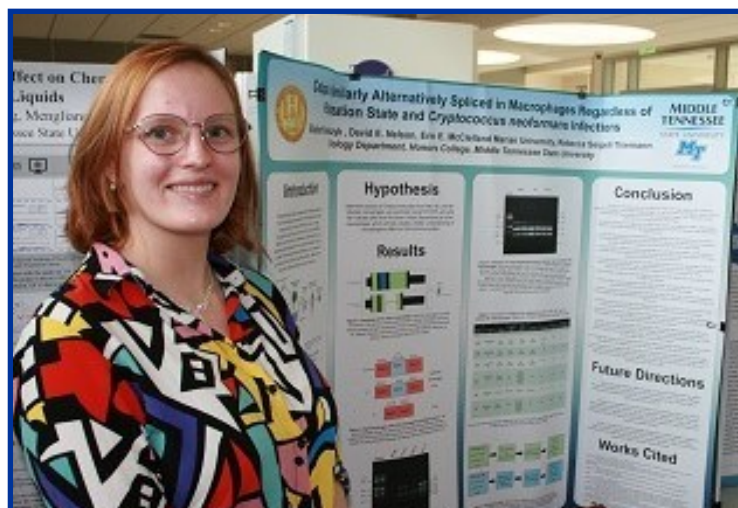
**Miranda Fain**, undergraduate BIOL, **Yangseung Jeong**, faculty mentor BIOL; "Exploring Scavengers in Murfreesboro, Tennessee"



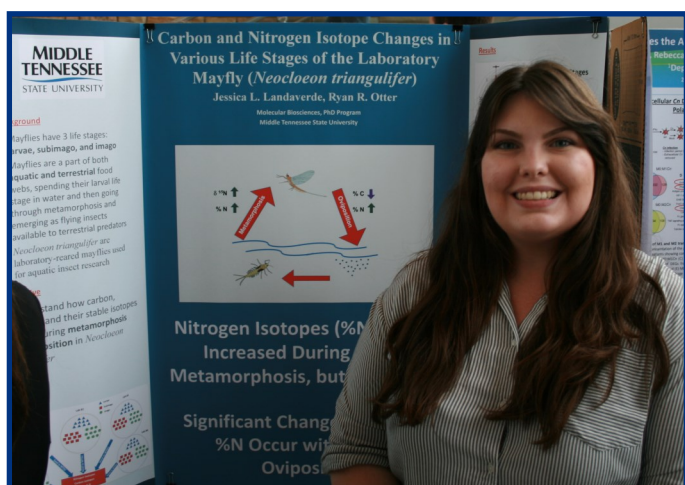
**Marina Khalil**, undergraduate BIOL; **Rebecca Seipelt-Thiemann**, faculty mentor BIOL; "Alternative Splicing of F36H2 Exon 3 in Response to Osmotic Stress in Nematodes"



**Nicole Gammons**, MOBI PhD, **Shruthi Perna**, MOBI PhD, **Carson Vanderford**, undergraduate BIOL, **Judith Iriarte-Gross**, faculty mentor CHEM; "Women undergraduate and graduate students empowering the next generation in STEM"



**Elizabeth Kowalczyk**, undergraduate BIOL, **David E. Nelson**, faculty mentor BIOL; "Cebpa is Similarly Alternatively Spliced in Macrophages Regardless of Polarization State and Cryptococcus neoformans Infections"



**Jessica Landaverde**, MOBI PhD, **Ryan Otter**, faculty mentor BIOL; "Carbon and Nitrogen Isotope Changes in Various Life Stages of the Laboratory Mayfly (*Neocloeon triangulifer*)"

# CBAS Posters in the Atrium March 22, 2022



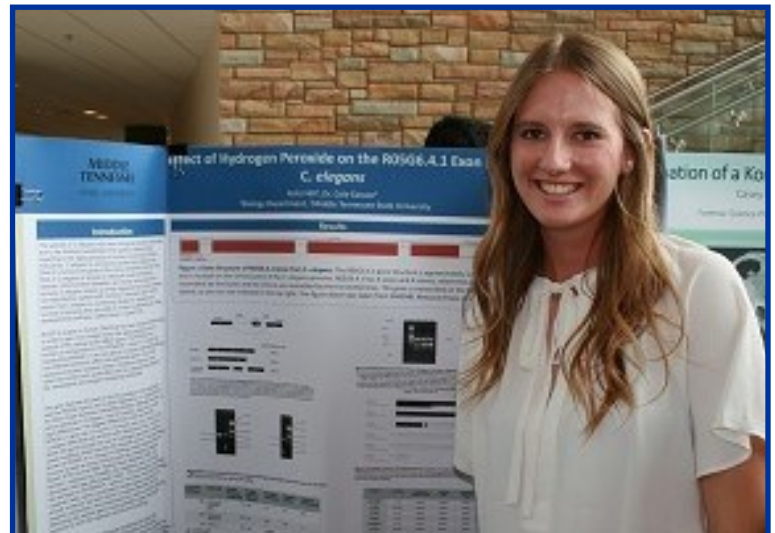
**Khadijah Alnassari**, undergraduate BIOL, **Ahmed Alnassari**, undergraduate BIOL, **Fatimah Alnassari**, undergraduate BIOL, **Zaynab Alnassari**, undergraduate BIOL; **Ying Gao**, faculty mentor AGRI; "Optimization of a Rapid and Efficient Method for Ginsenoside Extraction"



**Nicole Gammons**, MOBI PhD, **Elliot Alman**, faculty mentor BIOL; "Traditional Genetic Approach for the Utilization of Lignocellulosic Hydrolysate for Bioethanol Production"

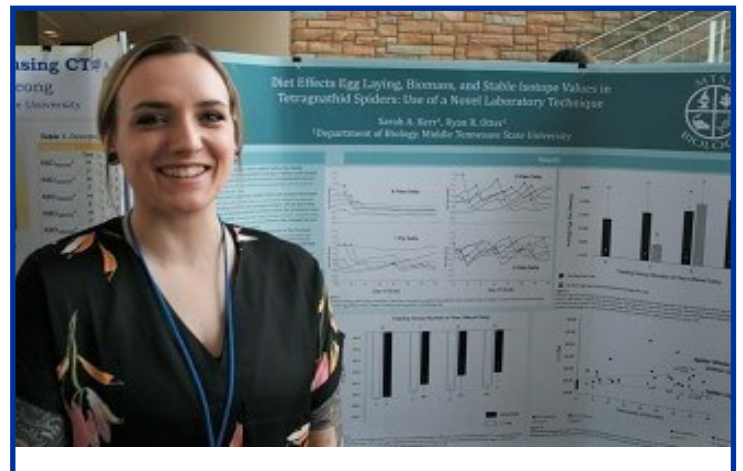


**Leslie Gonzalez Salazar**, undergraduate BIOL, **Yangseung Jeong**, faculty mentor BIOL; "Sex estimation of Korean population using CT images"

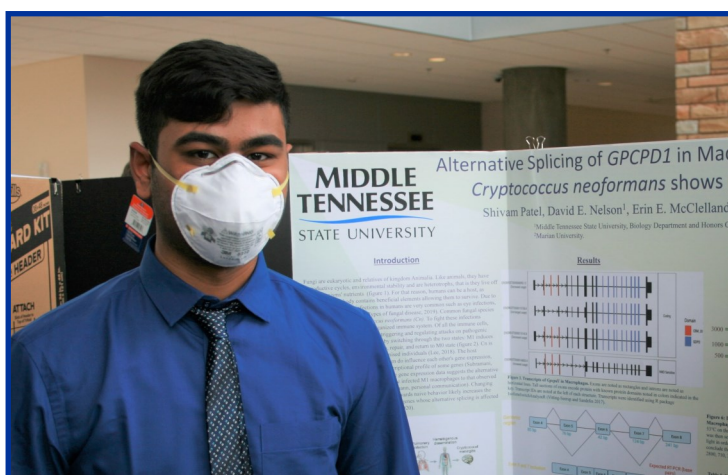


**Kelci Hill**, undergraduate BIOL, **Cole Easson**, faculty mentor BIOL; "Effect of Hydrogen Peroxide on the Ro5G6.4.1 in C. Elegans"

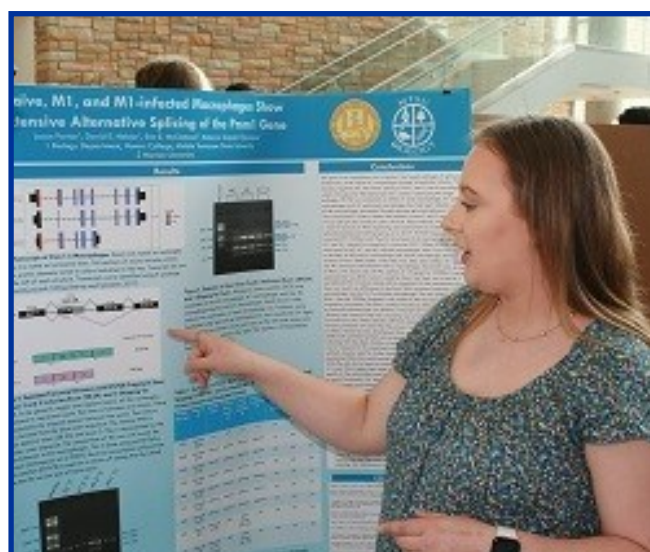
**Sarah Kerr**, undergraduate BIOL, **Ryan Otter**, faculty mentor BIOL; "Diet effects biomass, egg laying, and stable isotope signatures in the bioindicator spider Tetragnathidae: Use of a novel laboratory technique"



# CBAS Posters in the Atrium March 22, 2022



**Shivam Patel**, undergraduate BIOL, **David E. Nelson**, faculty mentor BIOL; "Alternative Splicing of GPCPD1 in Macrophages Infected with *Cryptococcus neoformans* shows Four New Isoforms"



**Lacron Parton**, undergraduate BIOL, **David E. Nelson**, faculty mentor BIOL; "Naive, M1, and M1-infected Macrophages Show Alternative Splicing of the Pmm1 Gene"



**Jessy Shearer**, undergraduate BIOL, **Maegan Hollis**, faculty mentor ANSC; "Effect of Heat Stress on Serum Metabolic Profile of Lactating Holstein and Jersey Dairy Cows"



**Shadrach Ofoegbu**, undergraduate BIOL, **Frank Bailey**, faculty mentor BIOL; "East Fork Stones River Harmful Algae Bloom Monitoring and Sampling"

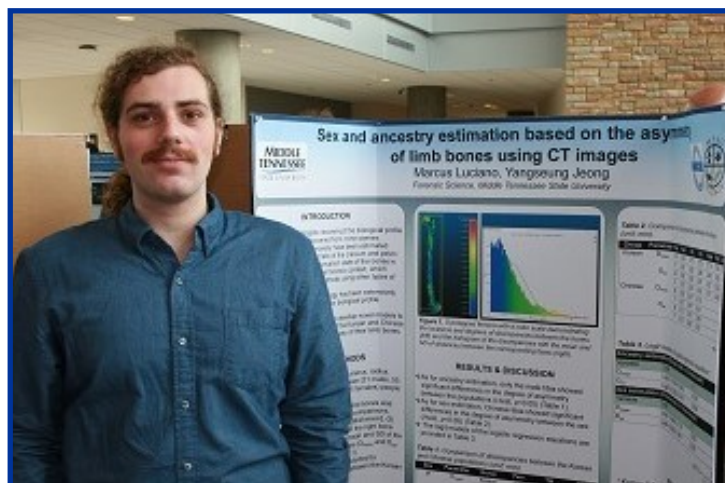
**Karolin Abouelyamin**, undergraduate BIOL, **Sylvia Zakher**, undergraduate CHEM, **Gregory Rushton**, faculty mentor TSEC; "Investigating Classroom Discourse and Facilitation Approaches in an Active Learning Process Oriented Guided Inquiry Learning (POGIL) - Based General Chemistry Class"

**Stephen Fox**, undergraduate CHEM, **Cole Eason**, faculty mentor BIOL; "Alternative Splicing of DAF-21 Exon 2 Under Cold Stress Conditions in Nematode *C. elegans*"

# CBAS Posters in the Atrium March 22, 2022



**Tia King**, BIOL undergraduate, **Racha El Kadiri**, faculty mentor, Geosciences; "A Temporal Analysis of Land Management Trends for Twenty Watersheds Over a 12 Year Period: USDA Summer Experiential Learning Project"



**Marcus Luciano**, BIOL undergraduate, **Yangseung Jeong**, faculty mentor BIOL; "Sex and Ancestry Estimation Based on the Asymmetry of Limb Bones Using CT Images"

**Janna Abou-Rahma**, CHEM undergraduate, **Rebecca Seipelt-Thiemann**, faculty mentor BIOL; "Nob1 is Alternatively Spliced in Naive, M1, and M1 Macrophages Infected with Cryptococcus Neoformans"

**Emaa Elrayah**, BIOL undergraduate, **Sarah Garcia**, graduate BIOL, **Rebecca Seipelt-Thiemann**, faculty mentor BIOL; "Alternative Splicing of F36H2/CR2 Exon 12 in Response to Heat Stress in Nematodes"

**Carson Vanderford**, BIOL undergraduate, **Lori Klukowski**, MSE PhD, **Rebecca Seipelt-Thiemann**, faculty mentor BIOL; "Alternative Splicing of UNC-36 Exon-10 in Response to Oxidative Stress by Paraquat in *C. elegans*"

**Bismah Aslam**, BIOL undergraduate, **Rebecca Seipelt-Thiemann**, faculty mentor BIOL; "Dus2 Expression in Infected Macrophage"

**Olena James**, MSE PhD, **Grant Gardner**, faculty mentor BIOL; "Biology Instructors' Approaches to Teaching Online During the COVID-19 Pandemic"

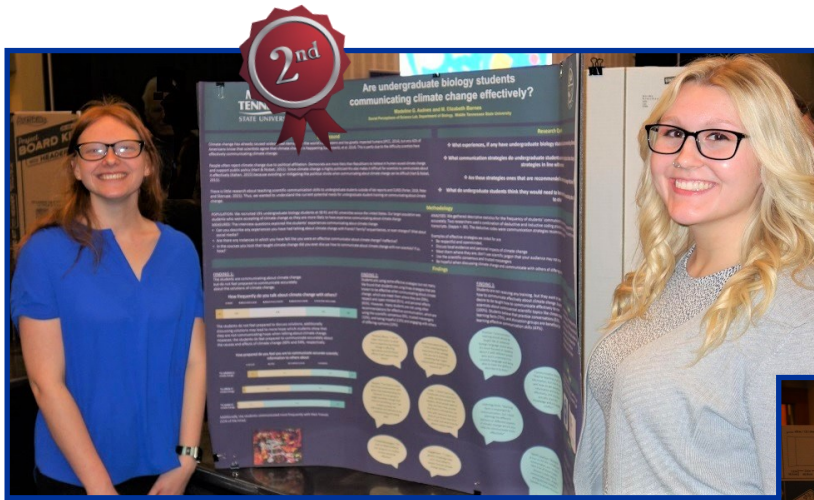
**Emma Norrod**, CHEM undergraduate, **Meirola Endraws**, CHEM undergraduate, **Brock Couch**, MSE PhD, **Grant Gardner**, faculty mentor BIOL; "Whose Idea Was This?: Understanding Students' Collaborative Group Answers"

**Casey Tomlin**, BIOL undergraduate, **Yangseung Jeong**, faculty mentor BIOL; "Age estimation of Korean population using CT images"

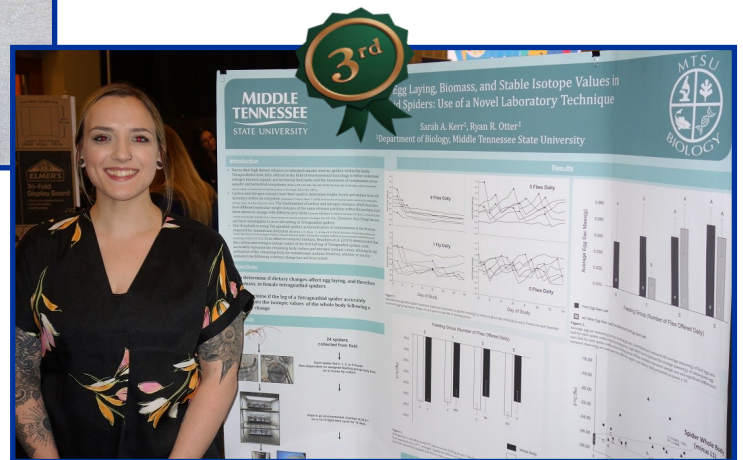


# University-Wide Scholars Week Poster & Creative Activity Exposition

Congratulations to the CBAS 2022 University-Wide Scholars Week Poster & Creative Activity Exposition *undergraduate* winning authors and their faculty mentors!

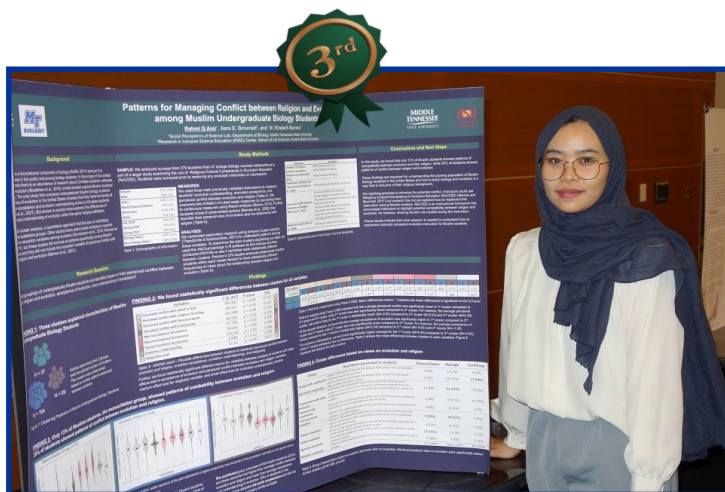


**Madeline Aadnes, BIOL undergraduate, Alexa Summersill, PSY undergraduate, M. Elizabeth Barnes, faculty mentor BIOL;** "Undergraduate Students' Climate Change Communication Experiences and Training"



**Sarah Kerr, BIOL undergraduate, Ryan Otter, faculty mentor BIOL;** "Diet effects biomass, egg laying, and stable isotope signatures in the bio-indicator spider Tetragnathidae: Use of a novel laboratory technique"

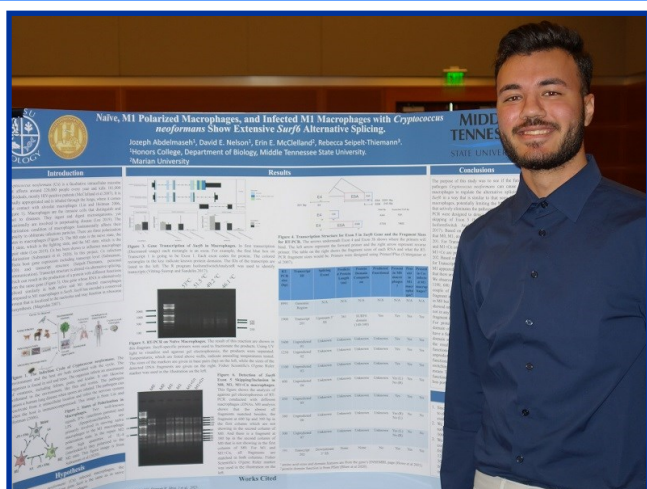
Congratulations to the CBAS 2022 University-Wide Scholars Week Poster & Creative Activity Exposition *graduate* winning author and her faculty mentor!



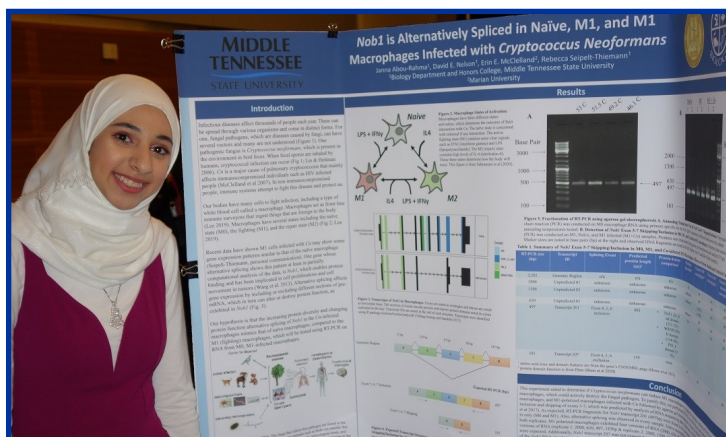
**Rahmi Aini, MSE PhD, Sara Brownell, M. Elizabeth Barnes, faculty mentor, BIOL;** "Patterns for managing conflict between religion and evolution among Muslim undergraduate biology students"

# Scholars Week Highlights Faculty and Student Research

## University-Wide Poster Exposition—March 25, 2022

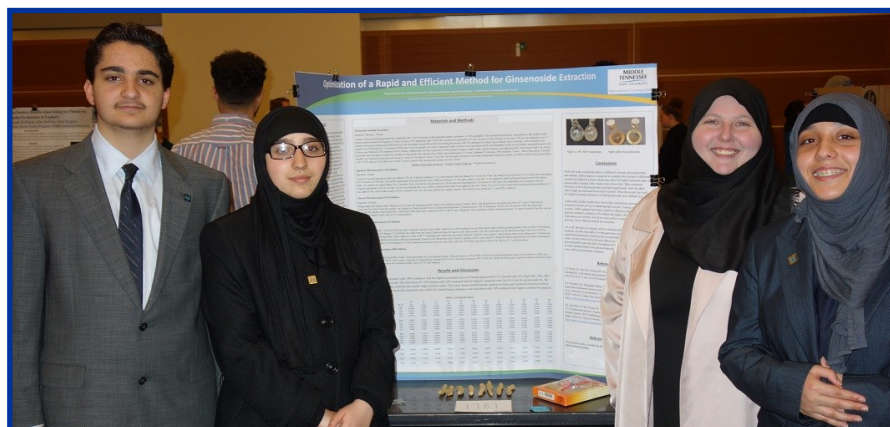
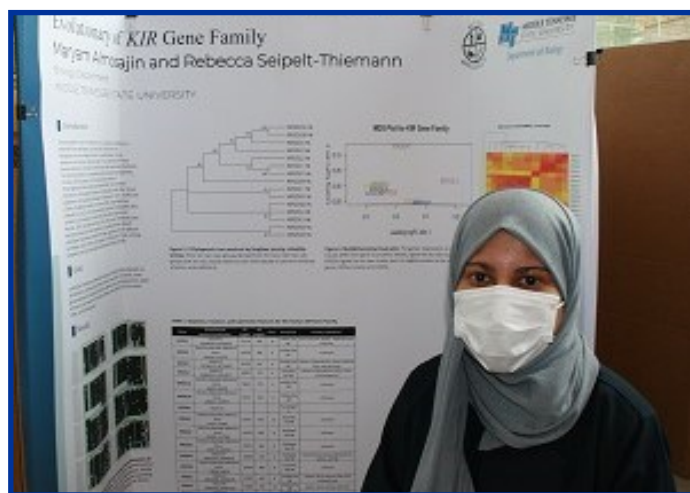


**Joseph Abdelmas**, CHEM undergraduate, **Rebecca Seipelt-Thiemann**, faculty mentor BIOL; "Naive, M1 Polarized Macrophages, and M1 Macrophages Infected with *Cryptococcus neoformans* Show Extensive *Surf6* Alternative Splicing"



**Janna Abou-Rahma**, CHEM undergraduate, **Rebecca Seipelt-Thiemann**, faculty mentor, BIOL; "Nob1 is Alternatively Spliced in Naive, M1, and M1 Macrophages Infected with *Cryptococcus Neoformans*"

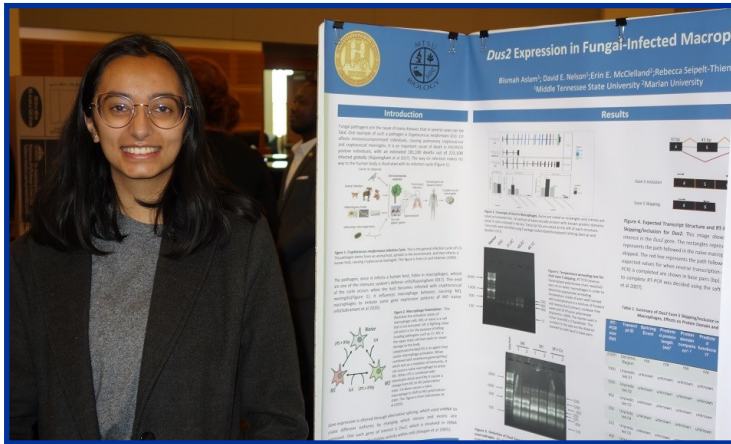
**Maryam Almosajin**, BIOL undergraduate, **Rebecca Seipelt-Thiemann**, faculty mentor BIOL; "Evolutionary of *KIR* Gene Family"



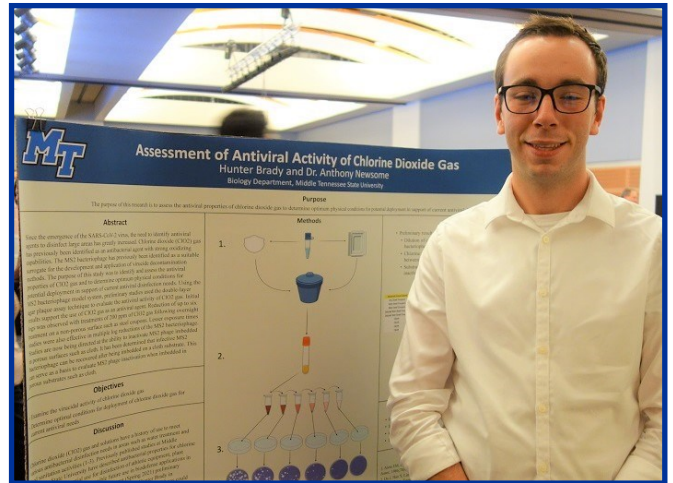
**Khadijah Alnassari**, **Ahmed Alnassari**, **Fatimah Alnassari**, **Saynab Alnassari**, BIOL undergraduates, **Roderick Moore**, MOBI PhD, **Ying Gao**, faculty mentor AGRI; "Optimization of a Rapid and Efficient Method for Ginsenoside Extraction"

# Scholars Week Highlights Faculty and Student Research

## University-Wide Poster Exposition—March 25, 2022



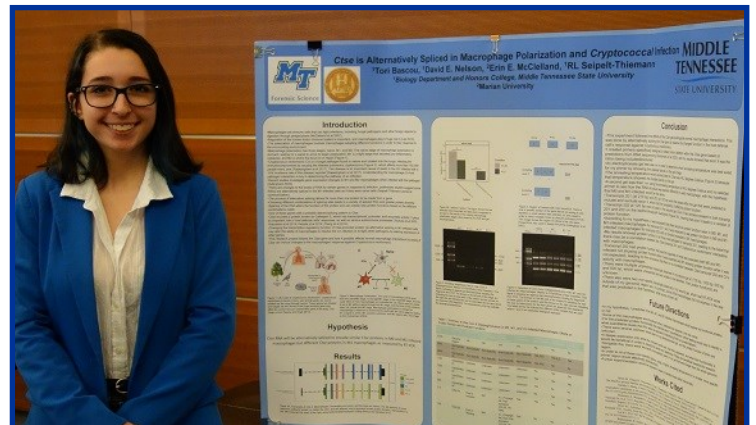
**Bismah Aslam**, BIOL undergraduate, **Rebecca Seipelt-Thiemann**, faculty mentor BIOL; "Dus2 Expression in Infected Macrophage"



**Hunter Brady**, BIOL undergraduate, **Anthony Newsome**, faculty mentor BIOL; "Evaluation of the Antiviral Capabilities of Chlorine Dioxide Gas"



**Chloe Bowen**, Dec. 2021 graduate BIOL, **Alexa Summersill**, PSY undergraduate, **Madeline Aadnes**, BIOL undergraduate, **Laine Matthews**, CHEM undergraduate, **M. Elizabeth Barnes**, faculty mentor BIOL; "Exploring Black Undergraduate Biology Students' Experiences Learning about COVID19 and Communicating about COVID19 to their Communities"

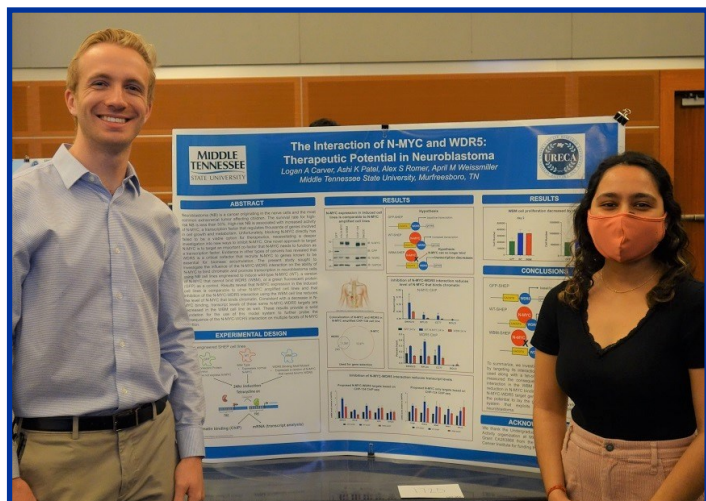


**Victoria Bascou**, FRSC undergraduate, **Rebecca Seipelt-Thiemann**, faculty mentor, BIOL; "The Affect of Macrophage Interactions alongside the Ctse Gene"

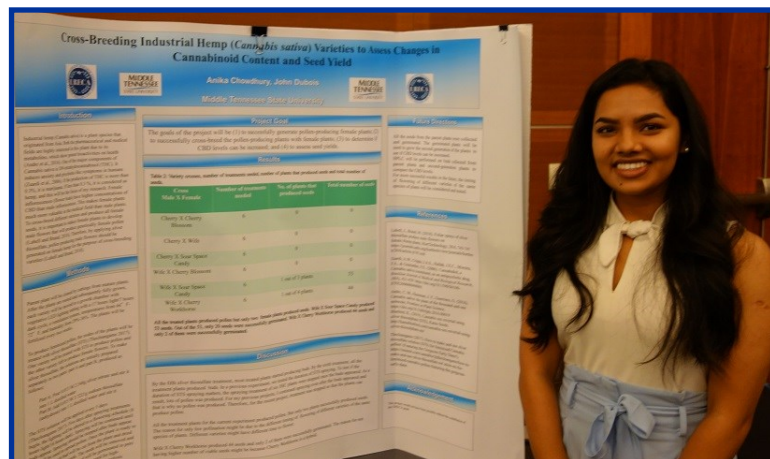


# Scholars Week Highlights Faculty and Student Research

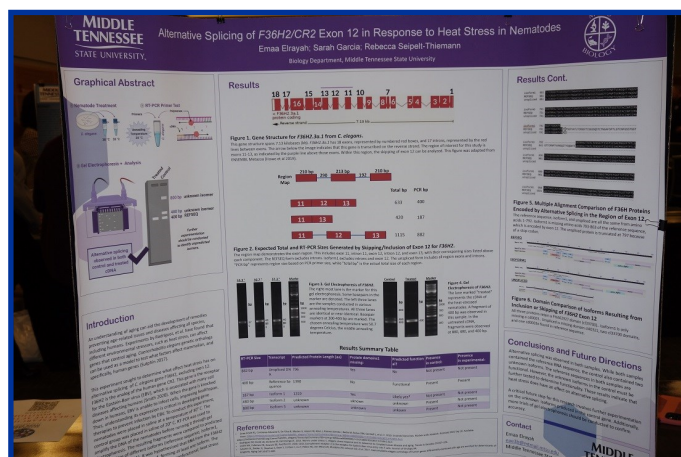
## University-Wide Poster Exposition—March 25, 2022



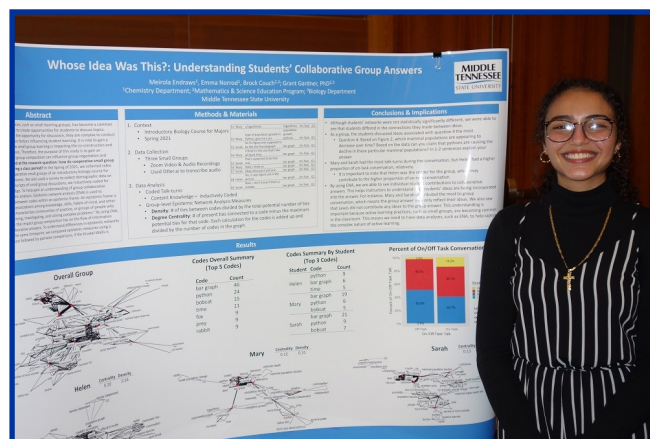
**Logan Carver**, PSY undergraduate, **Ashi Patel**, PSY undergraduate, **Alexander Romer**; **Dr. April Weissmiller** faculty mentor BIOL; "The Interactions of N-MYC and WDR5: Therapeutic Potential in Neuroblastoma"



**Anika Chowdhury**, BIOL undergraduate, **John DuBois**, faculty mentor BIOL; "Cross-Breeding Industrial Hemp (*Cannabis sativa*) Varieties to Assess Changes in Cannabinoid Content and Seed Yield"



**Emaa Elrayah**, BIOL undergraduate, **Sarah Garcia** BIOL MS, **Rebecca Seipelt-Thiemann**, faculty mentor BIOL; "Alternative Splicing of F36H2/CR2 Exon 12 in Response to Heat Stress in Nematodes"

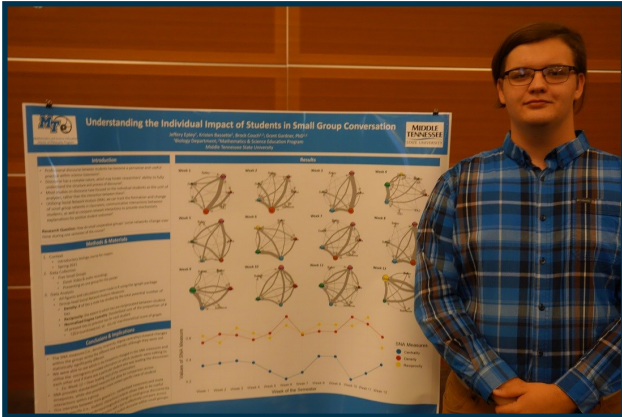


**Meirola Endraws**, CHEM undergraduate, **Emma Norrod**, CHEM undergraduate, **Brock Couch**, MSE PhD, **Grand Gardner**, faculty mentor BIOL; "Whose Idea Was This?: Understanding Students' Collaborative Group Answers"

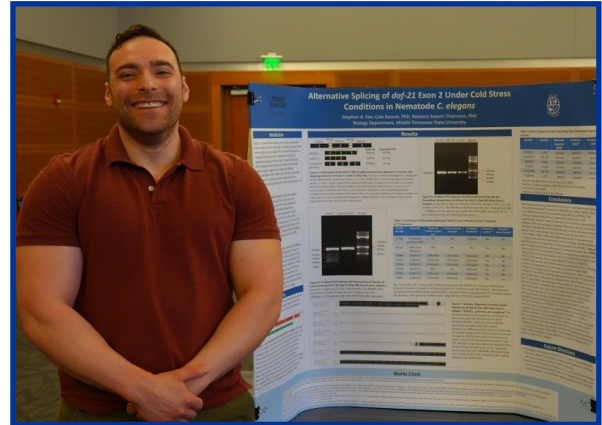


# Scholars Week Highlights Faculty and Student Research

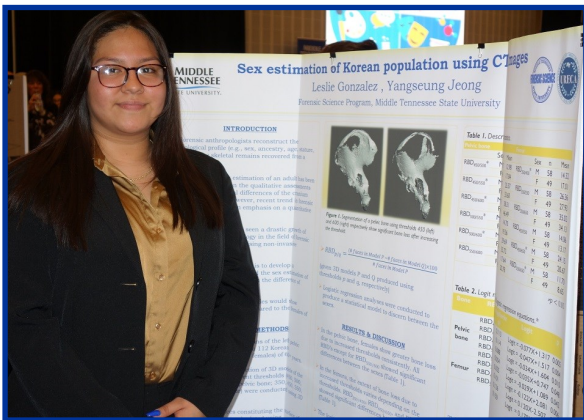
## University-Wide Poster Exposition—March 25, 2022



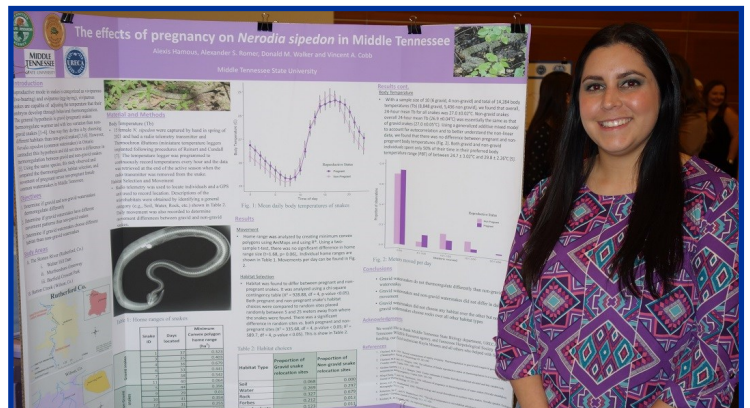
**Jeffrey Epley**, BIOL undergraduate, **Kristen Bassette**, BIOL undergraduate, **Brock Couch**, MSE PhD, **Grant Gardner**, faculty mentor BIOL; "Understanding the Individual Impact of Students in Small Group Conversation"



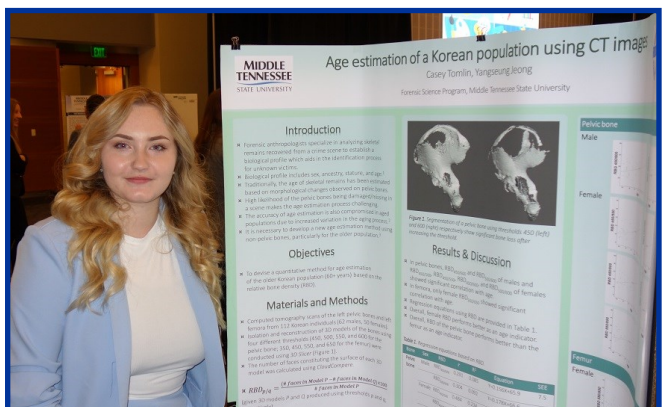
**Stephen Fox**, CHEM undergraduate, **Cole Eason**, faculty mentor BIOL; "Alternative Splicing of DAF-21 Exon 2 Under Cold Stress Conditions in Nematode *C. elegans*"



**Leslie Gonzalez Salazar**, undergraduate BIOL, **Yangseung Jeong**, faculty mentor BIOL; "Sex estimation of Korean population using CT images"



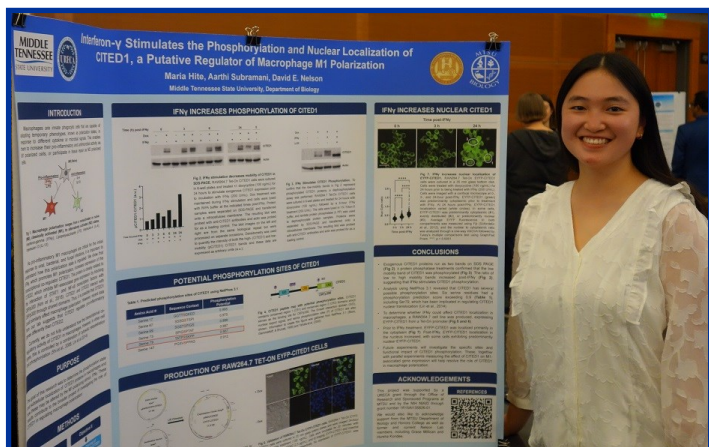
**Alexis Hamous**, BIOL MS, **Alexander S. Romer**, **Vincent A. Cobb**, faculty mentor BIOL; "Gestation site selection and thermoregulation of *Nerodia sipedon* in Middle Tennessee"



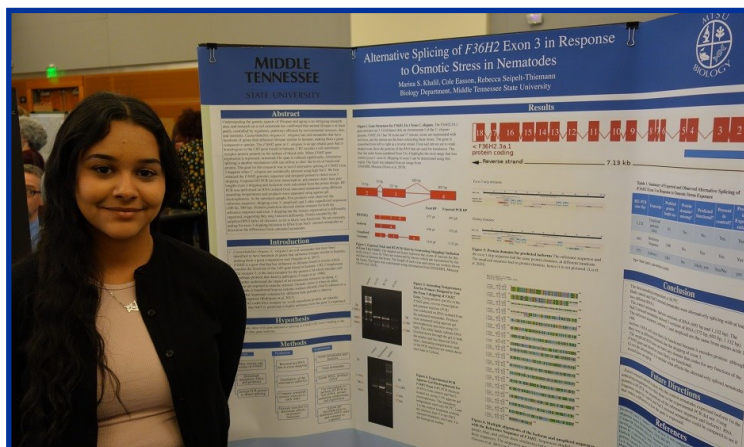
**Casey Tomlin**, BIOL undergraduate, **Yangseung Jeong**, faculty mentor BIOL; "Age estimation of Korean population using CT images"

# Scholars Week Highlights Faculty and Student Research

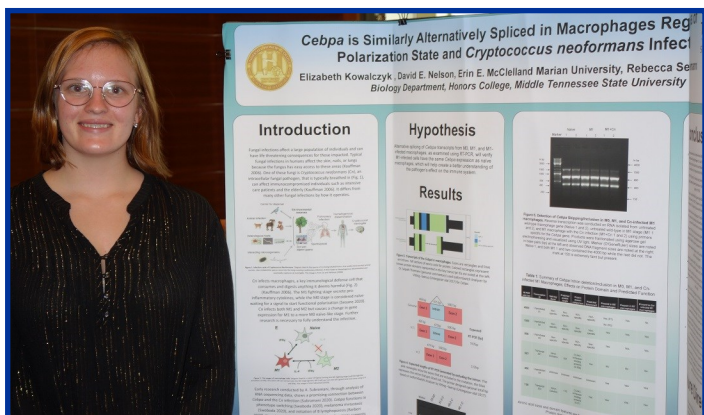
University-Wide Poster Exposition—March 25, 2022



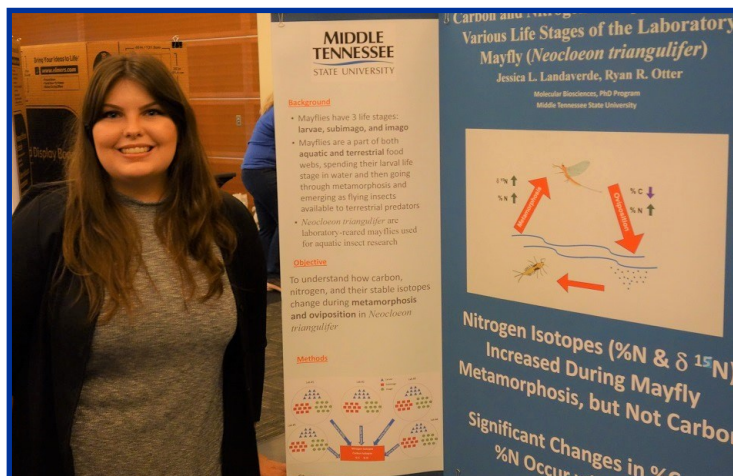
**Maria Hite**, CHEM undergraduate, **Aarthi Subramani**, MOBI PhD, **David E. Nelson**, faculty mentor BIOL; "The Subcellular Localization and Phosphorylation State of CITED1 in Macrophages"



**Marina Khalil**, BIOL undergraduate, **Rebecca Seipelt-Thiemann**, faculty mentor BIOL; "Alternative Splicing of F36H2 Exon 3 in Response to Osmotic Stress in Nematodes"



**Elizabeth Kowalczyk**, BIOL undergraduate, **Rebecca Seipelt-Thiemann**, faculty mentor BIOL; "Cebpa is Similarly Alternatively Spliced in Macrophages Regardless of Polarization State and Cryptococcus neoformans Infections"

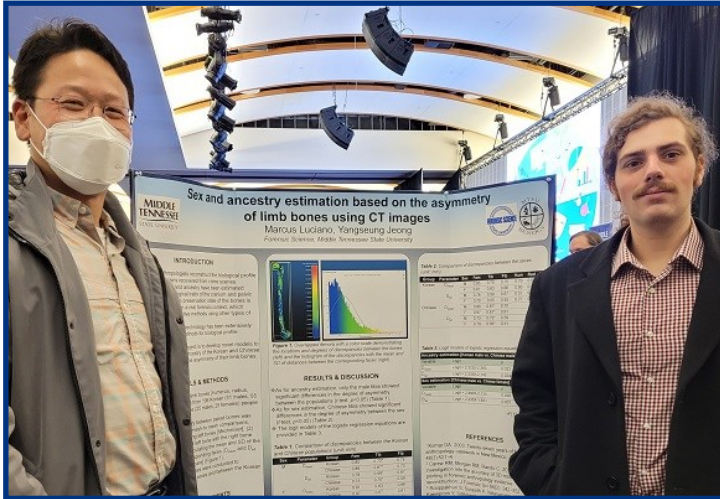


**Jessica Landaverde**, MOBI PhD, **Ryan Otter**, faculty mentor BIOL; "Carbon and Nitrogen Isotope Changes in Various Life Stages of the Laboratory Mayfly (*Neocloeon triangulifer*)"



# Scholars Week Highlights Faculty and Student Research

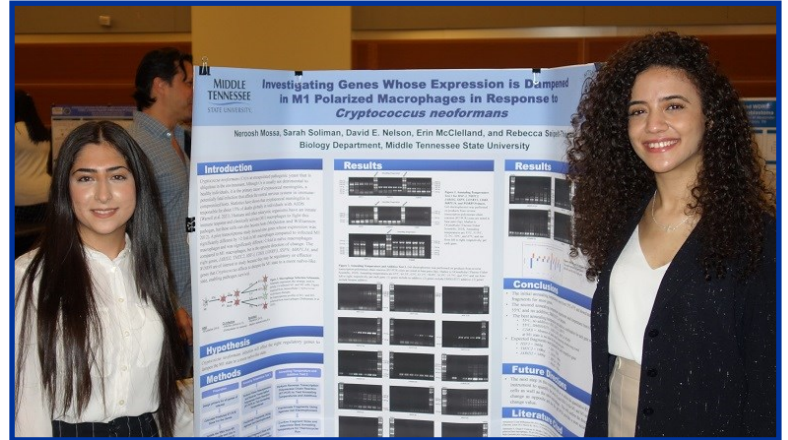
University-Wide Poster Exposition—March 25, 2022



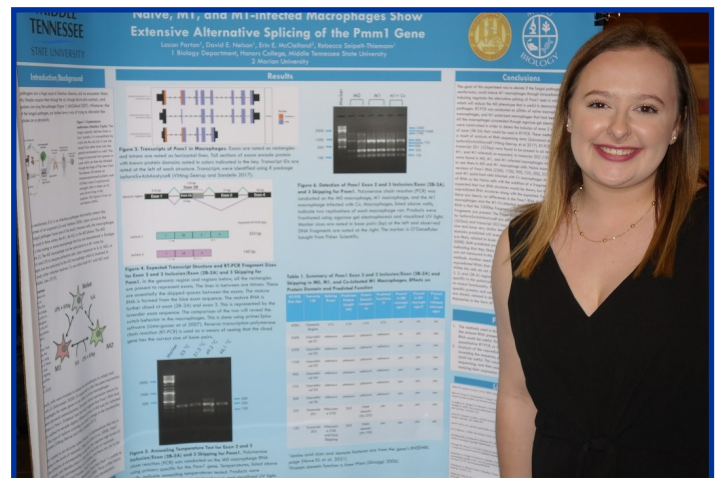
**Marcus Luciano**, FRSC undergraduate, **Yangseung Jeong**, faculty mentor BIOL; "Sex and Ancestry Estimation Based on the Asymmetry of Limb Bones Using CT Images "



**Shadrach Ofoegbu**, BIOL undergraduate, **Frank Bailey**, faculty mentor BIOL; "East Stones River Harmful Algae Bloom Monitoring and Sampling"



**Neroosh Mossa**, BIOL undergraduate, **Sarah Soliman**, BIOL undergraduate, **David E. Nelson**, Erin McClelland, **Rebecca Seipelt-Thiemann**, faculty mentor, BIOL; "Investigating Genes Whose Expression is Dampened in M1 Polarized Macrophages in Response to *Cryptococcus neoformans* Infection"

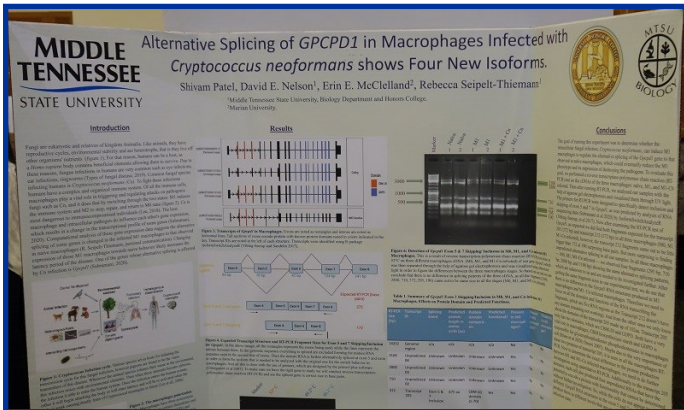


**Lacon Parton**, BIOL undergraduate, **Rebecca Seipelt-Thiemann**, faculty mentor BIOL; "Naïve, M1, and M1-infected Macrophages Show Alternative Splicing of the Pmm1 Gene"

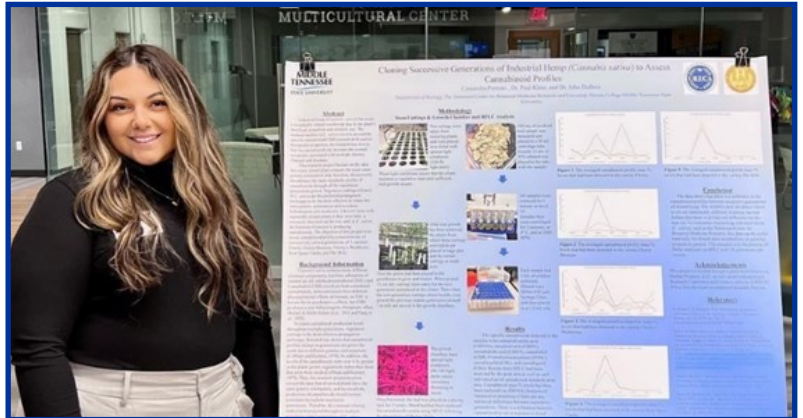


# Scholars Week Highlights Faculty and Student Research

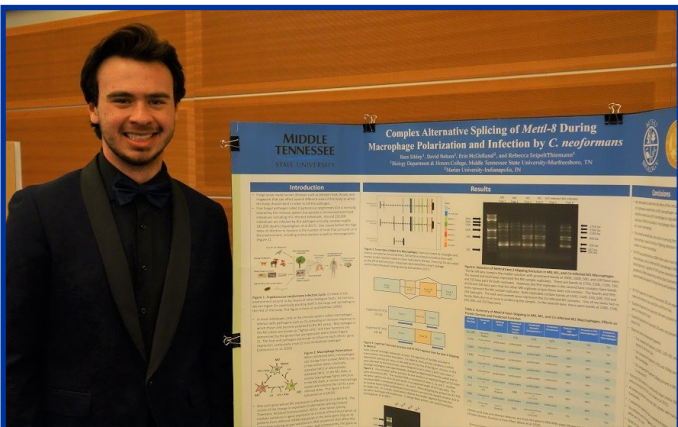
## University-Wide Poster Exposition—March 25, 2022



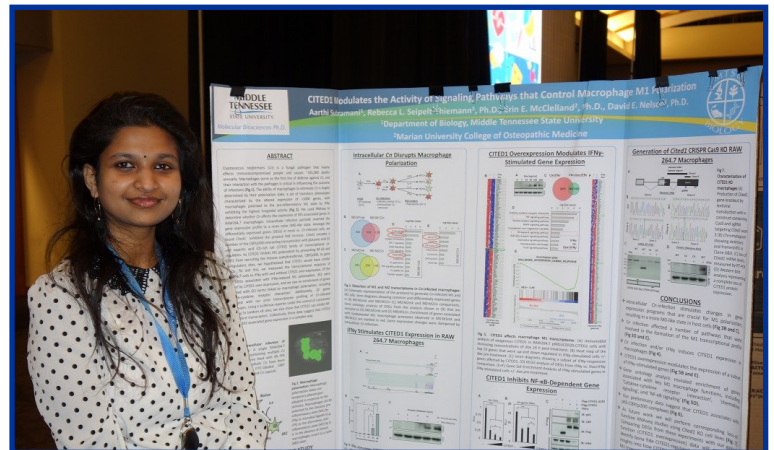
**Shivam Patel**, BIOL undergraduate, **David E. Nelson**, **Erin McClelland**, **Rebecca Seipelt-Thiemann**, faculty mentor BIOL; “Alternative Splicing of *GPCPD1* in Macrophages Infected with *Cryptococcus neoformans* shows Four New Isoforms”



**Cassandra Perrone**, BIOL undergraduate, **Paul Kline**, **John DuBois**, faculty mentor BIOL; “Cloning successive generations of industrial hemp (*Cannabis sativa*) to assess cannabinoid profiles”



**Ross Sibley**, BIOL undergraduate, **Rebecca Seipelt-Thiemann**, faculty mentor BIOL; “Complex Alternative Splicing of *Mettl-8* During Macrophage Polarization and Infection by *C. neoformans*”



**Aarthi Subramani**, MOBI PhD, **Rebecca Seipelt-Thiemann**, **Erin McClelland**, **David E. Nelson**, faculty mentor BIOL; “A Transcriptional Co-regulator, *CITED1*, as a Putative Inhibitor of IFN $\gamma$ -Stimulated M1 Polarization in Macrophages”

## Undergraduate Student Recognition

### Barry Goldwater Scholarship awarded to BIOL/PSY major Yaseen Ginnab

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. Congratulations, Yaseen!!!

# 2022 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.

**Kurt Blum Scholarship:** Awarded to support research efforts.

***Cameron Oldham***

**William H. Butler, Jr. Graduate Research Scholarship:** Awarded to graduate students to provide support for expenses associated with thesis research.

***Joy Creighton***

***Luis Zuniga-Acuna***

**Cynthia Chappell Summer Stipend:** Awarded to support research efforts.

***Natalie Schroth***

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

***Khadija Alnassari***

***Mary McKenna Hunt***

***Jesse Scobee***

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

***Molly Gilliland***

***Yaseen Ginnab***

**Kevin Driver Memorial Biology Scholarship:**

Awarded to support research efforts.

***Alexis Hamous***

***Cheyenne Jones***

**John D. DuBois Scholarship:** Awarded to support research efforts.

***Sarah Clark***

***Natalie Schroth***

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

***Leigh Bumpous***

***Sarah Clark***

***Ashley Gereben***

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

***Joy Creighton***

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

***Leigh Bumpous***

**Charles Holland Biology Scholarship:** Awarded to support research efforts.

***Hunter Brady***

***Sydney Robbins***

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

***Catheryn Bolick***

***Sierra Cruz***

***Fadumo Muhumad***

**J. Padgett Kelly Research Scholarship:** Awarded to provide support of expenses associated with thesis research.

***Sierra Cruz***

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

***Savannah Lawwell***

***Travis Lawson***

# 2022 Biology Scholarship Recipients

**Mitchell Magid Memorial Work Scholarship:**

Awarded to support research efforts.

***Montserrat Aguado***      ***Elizabeth Kowalczyk***  
***Casey Tomlin***

**Charles R. McGhee Scholarship:** Awarded to support research efforts.

***Alexis Hamous***

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

***Alexis Hamous***

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

***Sarah Clark***      ***Natalie Schroth***

**George G. Murphy Scholarship:** Awarded to support research efforts.

***Jesse Scobee***

**J. Gerald Parchment Scholarship:** Awarded to support research efforts.

***Delaney Gilley***

**John A. Patten Scholarship:** Awarded to support research efforts.

***Delaney Gilley***

**Maria de los Reyes Biology Scholarship:**

Awarded to support research efforts.

***Cinthia Reed***      ***Luis Zuniga-Acuna***

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

***Yaseen Ginnab***

**Ralph E. Sharp Scholarship:** Awarded to support research efforts.

***Natalie Schroth***

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

***Mary McKenna Hunt***      ***Shadrach Ofoegbu***  
***Claire Matzek***

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

***Claire Matzek***      ***Sydney Robbins***

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

***Joy Creighton***      ***Ashley Gereben***

**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.

***Ignacio Cervantes***

**Stephen M. Wright Research Scholarship:**

Awarded to support research efforts.

***Hunter Brady***

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

***Luis Zuniga-Acuna***

# 2022 Biology Scholarship Recipients

## Incoming Freshman Scholarships 2021-2022

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

*Sean Willis*

## Outstanding Students

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

*Sofia Botros*

*Karmina Ghobrial*

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

*Sydney Robbins*

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

*Brionna Cunningham*

*Jesse Scobee*

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

*Yaseen Ginnab*

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

*Elizabeth Kowalczyk*

## 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](mailto:biology@mtsu.edu)

