

Beta Beta Beta

BIOLOGICAL HONOR SOCIETY



2024 National Convention

Hosted by the Mu Omicron Chapter Columbus State University

May 29th – June 2nd, 2024



2024 National Convention

Hosted by the Mu Omicron Chapter



Columbus, Georgia May 29th – June 2nd, 2024

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WELCOME FROM THE NATIONAL PRESIDENT

Welcome to the 2024 TriBeta National Convention hosted by the local Mu Omicron chapter at Columbus State University on our Uptown River Park Campus. It is my distinct honor to serve you as your TriBeta President and on behalf of the National Executive Committee, we are excited to have you here to continue the purpose of our 102-year-old society, which is to:

- 1. To promote scholarship of biological knowledge
- 2. To promote dissemination of biological knowledge
- 3. To encourage research.

These three pillars of our society represent a culmination of what we are doing at this convention! You have conducted research and are here to share your findings and often we find that our results and research encourage more questions and more research. We are here to celebrate your achievements in completing your research!

We all know it can be stressful getting up in front of an audience and talking. Just remember you are the expert, we are here to learn from you, no one knows more about your project than you (and maybe your research mentor). So have fun sharing your discoveries, share what you have learned, and embrace this opportunity. Remember to acknowledge those who have helped you on your research journey, friends, biology peers, family members, faculty mentors, and any financial support you have been provided by your home department, university, or scholarships and grants like TriBeta or other funding agencies.

District and regional conventions have occurred across the US and Puerto Rico, resulting in many of you attending this national convention. These events are the result of many volunteer hours by your chapter advisors, district directors, and the National Executive Committee board members. In addition, Iris Daly, the Executive Director at the National office, and her assistant Connie Terry are dedicated to making sure everything is operating smoothly from chapter induction ceremonies to the intricate details involved in this convention. Iris has worked closely with several individuals from Columbus State University departments including Michell Repass and Isaac Faver from Continuing and Professional Education, Chloe McArdle, Residence Life, Jae' Cooper, University Operations, Aramark food services, and CSU transportation to name just a few groups that have come together to organize this convention.

Lastly, I want to remind you to be safe. This convention is on our uptown campus, so we are embedded in the city of Columbus. There will be a lot going on around us in addition to the convention so always be aware of your surroundings and be safe.

Take this time to make new friends, make connections, and learn about all the research your peers are conducting from across the US and Puerto Rico. Enjoy your convention and celebrate your accomplishments.

Kind Regards,

Julie Balleng

Dr. Julie Ballenger, TriBeta President



HELPFUL INFORMATION

DOWNLOAD PROGRAM PDF

We will have a limited number of printed programs available. For ease of access, please download the online program by scanning the QR code. Due to potential late abstract submittals, see the online program for the most up-to-date listing of the abstracts and presentation times. If you are already on the presentation schedule, your poster number or presentation time will not be impacted by late submissions.

SIGN-UP FOR CONVENTION ANNOUNCEMENTS & UPDATES

We will send convention updates and announcements through the Remind App. Please sign-up so you don't miss any important updates.

Class Name: BBB 2024 National Convention Class Code: @tribeta24

Sign-Up Link: http://rmd.at/tribeta24

Sign-Up via Text: Text the message @tribeta24 to the number 81010. Having trouble with 81010? Try texting @tribeta24 to (415) 813-2648.

WI-FI ACCESS

All devices can connect to the CSU wi-fi available as follows:

- Connect to the "CSU_Guest" network
- Click "Create New Wireless Account"
- Input your name and active email address. Please note that a Columbus State email address cannot be used for this network.
- After registering, you will receive an email with your credentials.
- You can then select "Login" to connect to the network.

CAMPUS MAP AND DORMITORY ADDRESSES

Broadway Crossing	
25 West 10 th Street	
Columbus, GA 31901	

Columbus Hall 1019 Broadway Avenue Columbus, GA 31901

Scan for Interactive Campus Map → Choose "RiverPark Campus"





R Remind

HAVE A PROBLEM?

Helpful contact numbers if needed.

- Campus Police Emergency: **706-507-8911**
- Campus Police Non-emergency: 706-568-2022
- Housing concerns (24/7): 706-507-8035
- Additional concerns: 706-507-8070

CSU SHUTTLE SERVICE FORM

Please let us know which shuttle time you intend to utilize for your departure. Complete the form from the link or QR code. <u>https://form.jotform.com/tribeta/csu-shuttle-service-sign-up</u>



SOCIAL MEDIA

Please tag us in your photos from the convention on Instagram and Facebook! Use the convention hashtag so we can see your photos!







SCHEDULE OF CONVENTION

The following is an outline of the convention schedule.

Time	Activity	Location	
	Wednesday, 5/29/2024		
8:30AM – 2:30PM	Executive Committee Meeting	Frank Brown Hall	
12PM – 8PM	Attendees Arrive – Check-In @ Registration	Broadway Crossing Lobby	
5PM – 7PM	Dinner	Rankin Den	
7PM – 9PM	Opening Meeting - Chapter Meet & Greet	Frank Brown Hall	
9PM – 10PM	Dessert Social	Frank Brown Hall Lobby	
Thursday, 5/30/2024			
7AM – 9AM	Breakfast	Rankin Den	
8AM - 9AM	Day Attendees – Check-In @ Registration	Corn Center	
9AM – 12PM	Poster Presentations, Silent Auction, Exhibitors	Corn Center	
11AM – 1PM	Lunch	Rankin Den	
1PM – 4PM	Oral Presentations	Frank Brown Hall	
5PM – 7PM	Dinner	Rankin Den	
7PM – 9PM	Keynote Speaker Meeting	Frank Brown Hall	
9PM – 10PM	Dessert Social	Frank Brown Hall Lobby	
Friday, May 31 st , 2024			
7AM – 9AM	Breakfast	Rankin Den	
9AM – 12PM	AM Field Trips	Various	
11AM – 1PM	Lunch	Rankin Den	
1PM – 4PM	PM Field Trips	Various	
6PM – 9PM	Awards Banquet	The Livery	
Saturday, June 1 st , 2024 (optional day)			
7AM – 9AM	Breakfast	Rankin Den	
9AM – 12PM	AM Field Trips	Various	
11AM – 1PM	Lunch	Rankin Den	
1PM – 4PM	PM Field Trips	Various	
5PM – 7PM	Dinner	Rankin Den	
7PM – 9PM	Games, Trivia, Activities or Free Evening	TBD	
Sunday, June 2 nd , 2024			
7AM – 9AM	Breakfast	Rankin Den	
9AM- 4PM	Everyone departs CSU Campus		

MAP OF RIVERPARK CAMPUS

Riverpark Campus Map

Buildings we will be utilizing for the convention are labeled on the map below. Link to CSU maps: <u>https://www.columbusstate.edu/maps/</u>



Uptown Parking Map <u>https://www.alwaysuptown.com/parking</u>)

If you are driving to the convention, please see the parking map and information below. A parking permit is not required.

- If you are a Day Attendee, park in P1, RiverCenter Deck, which is closer to the Corn Center where Poster Presentations will be held.
- If you are staying in the dormitories, park in P2, Front Ave. Deck, which connects via the 3rd floor to Broadway Crossing, where registration/check-in for dormitory attendees is on the 1st floor, lobby area.



RiverCenter Deck 919 Broadway Available: 24/7 Cost: Free



Front Ave. Deck 1028 Front Avenue Available: 24/7 (First Floor Only) Cost: Free



Bay Avenue Deck #4 12th St. Available: Weekends Only (Fri 5pm-Mon 8am) Cost: Free



THURSDAY EVENING'S KEYNOTE SPEAKER

Dr. Katey Hughes

https://medicine.mercer.edu/faculty/directory/katey-hughes/

A TriBeta member of the Psi Chapter at Winthrop University, Dr. Hughes has her roots in research and presented research at a TriBeta convention during her undergraduate career. She has since obtained her doctorate in Biomedical Sciences from the University of Florida and is now a Professor at Mercer University, School of Medicine, Columbus location.

Education

- BS, Biology, Winthrop University
- PhD, Biomedical Sciences Physiology, University of Florida

Selected Publications





- Smith BN, Burgess KS, and Hughes KS (2021). Effect of Estrogen Pretreatment on Cell Viability Following Stress Response. Georgia Journal of Science, 79(2).
- Hughes KS (2018). Encouraging Student Participation in Peer-Led Discussion Sessions. HAPS Educator, 22(1):55-60.
- Grimes WE and Hughes KS (2015). Protective Effects of Conjugated Equine Estrogens and 17-β Estradiol on Oxidatively Stressed Astrocytes. Eastern Biologist, 4:1-10.
- Hughes KS (2011). Research on Learning: Peer-Assisted Learning Strategies in Human Anatomy and Physiology. The American Biology Teacher, 73(3):144-147.
- Sellers KW, Sun C, Diez-Freire C, Waki H, Morisseau C, Falck JR, Hammock BD, Paton JF, Raizada MK (2005). Novel mechanism of brain soluble epoxide hydrolase-mediated blood pressure regulation in the spontaneously hypertensive rat. FASEB J, 19(6):626-8.
- Sun C, Sellers KW, Sumners C, Raizada MK (2005). NAD(P)H oxidase inhibitor attenuates neuronal chronotropic actions of Angiotensin II. Circ Res, 96(6):659-66.
- Veerasingham SJ, Sellers KW, Raizada MK (2004). Functional genomics as an emerging strategy for the investigation of central mechanisms in experimental hypertension. Progress in Biophysics & Molecular Biology, 84:107-123.
- Yang H, Francis SC, Sellers K, DeBarros M, Sun C, Sumners C, Ferrario CM, Katovich MJ, Muro AF, Raizada MK (2002). Hypertension-linked decrease in the expression of brain gamma-adducin. Circ Res, 91(7):633-9.
- Sellers KW, Katovich MJ, Gelband CH, Raizada MK (2001). Gene therapy to control hypertension: Current studies and future perspectives. The American Journal of the Medical Sciences.

Professional Involvement

Three Rivers Area Health Education Center, Board Member

SILENT AUCTION

All silent auction proceeds will go towards Travel Grant funding programs for members to attend TriBeta district and regional conventions each Spring.

Bidding starts at 9AM in the Corn Center on Thursday, May 30th.

Bidding ends before the Awards Banquet at 6:45PM Friday, May 31st.

Auction items are priced based on their fair market value.

Items are sold as-is.

Please inspect an item for any damage or other discrepancy before bidding on it.

Bids not meeting the minimum bidding increment requirement will be disqualified.

Bidding on an item multiple times is allowed.

Bidding/Winning on multiple items is allowed.

Winners will be determined at the end of the auction unless you purchase an item for the **Buy It Now price.** The bidder with the highest recorded bid at the end of the auction will be the winner.

Bidders agree to pay in full at the end of the auction.

After the awards banquet, all items must be paid for by 9:30pm Friday, May 31st. If payment is not received by 9:30pm, the next highest bidder will be contacted to purchase the item. Please come to the Silent Auction table with the item and bid sheet to make your payment.

Payment can be made via Venmo, PayPal, or in Cash.

All bids and sales are final.

FIELD TRIP INFORMATION

Coca-Cola Space Science Center

https://www.ccssc.org/

The Coca-Cola Space Science Center (CCSSC) in Columbus, Georgia is a division of Columbus State University (CSU) serving as an academic enrichment center for the university and a regional informal education institution for the public. Established in 1996, the CCSSC is Georgia's only science center and museum facility dedicated to providing experiences for students and public visitors in



astronomy and space science. Visitors include walk-in patrons, K-12 school groups from across the region, corporate and community organizations, and the university community.

Our mission is to inspire and educate the next generation of scientists, engineers, and science educators and communicators; to foster the public's appreciation for science and technology, and advance scientific literacy throughout our community.

Field Trip Times:

Friday AM (9am - 12pm) Friday PM (1pm - 4pm) Saturday AM (9am - 12pm) Saturday PM (1pm - 4pm)

Field Trip Fee: \$10/person **Address:** 701 Front Avenue, Columbus, GA 31901

Attendees will walk from the Riverpark campus to the Coca-Cola Space Science Center. A walking map is provided.



Oxbox Meadows Environmental Learning Center

https://oxbow.columbusstate.edu/

At the southern end of the Columbus RiverWalk, the Center offers a view of the ecoregion of West Central Georgia and the Chattahoochee Valley and provides access to samples of the area's rich communities of plants and animals. Opened in 1995 as a collaboration among Columbus Water Works, Columbus State University, and the City of Columbus, the Center provides



exhibits, displays and nature trails, and also offers formal and informal programs about the ecology and natural history of the region. Interpretive and hands-on programming is provided by Columbus State University professional staff, contributing faculty, student assistants, and volunteers.

The Center includes one classroom-laboratory, an 86-seat auditorium, state-of-the-art instructional media, the Natural History Discovery Center, indoor and outdoor exhibits of living reptiles and fish, a stream habitat supporting various plants and animals, a pollinator garden, bee hives, and environmental art.

Field Trip Times: Friday AM (9am - 12pm) or Saturday AM (9am - 12pm) only. No afternoon tours are available.

Field Trip Fee: \$10/person Address: 3535 S Lumpkin Road, Columbus, GA 31903

Attendees will be shuttled on CSU Vans for this field trip. Meeting time and location will be announced Thursday night.

White Water Express

https://www.whitewaterexpress.com/

Located in the heart of downtown Columbus is the Chattahoochee Whitewater Park, the largest urban whitewater course in the world, this course offers a 2.5 mile stretch of rapids perfect for families of all age groups. Our group will go down for the The Classic whitewater experience.



Field Trip Times:

Friday AM (9am - 12pm) Friday PM (1pm - 4pm) Saturday AM (9am - 12pm) Saturday PM (1pm - 4pm)

Field Trip Fee: \$45/person **Address:** 1000 Bay Avenue, Columbus, GA 31901

Attendees will walk from the Riverpark campus to White Water Express. A walking map is provided below.



CONVENTION T-SHIRT DESIGN



A special Thank You to Heather Tolbert, for her graphic design artwork for the back of the 2024 convention t-shirt. Heather currently teaches life science in Alabama and is a graduate of Columbus State University.

The plants and animals depicted in the design represent Georgia's rare and endangered species.

- Red-cockaded Woodpecker, Dryobates borealis
- American White Ibis, *Eudocimus albus*
- Gopher Tortoise, Gopherus polyphemus
- Sweet Pitcher Plant, Sarracenia rubra
- Relict Trillium, Trillium reliquum

BIOS

What is BIOS?

BIOS is the journal of the Beta Beta Beta Biological Society, published since 1930. Now available online exclusively, BIOS is published four times per year in March, June, September, and December. Special emphasis is placed on the publication of undergraduate research papers.

Purpose

Publish matters that pertain to the affairs of the Society. Publish articles by members.

Publish articles that will be of general interest to biologists.

- TriBeta believes that research is not finished until its results are shared with others.
- TriBeta members have the unique opportunity to publish their undergraduate work in BIOS.
- All manuscripts undergo the standard scientific procedure of review, editorial acceptance or rejection, and technical editing.

Publish in BIOS

Published research has often won prior awards and the McClung Award recognizes the most outstanding paper published in BIOS each year.

Be a BIOS Reviewer

We are always looking for qualified reviewers! We do not overload our reviewers with many articles to review throughout the year. The average may be 2 per year. When you register to be a reviewer, you select the areas you feel most comfortable or most qualified to review. As articles are submitted for publication consideration that match your area of expertise, the Editor will reach out to check your availability.

Read BIOS Online!



Become a Reviewer!







BIOS Editor

Dr. Nancy Todd <u>BIOS@tribeta.org</u> www.tribeta.org/BIOS

PRESENTATION SCHEDULE

All poster presentations will take place on Thursday morning from 9am – 12pm in the Corn Center. Posters must be in place no later than 8:45am and presenters must stand with their poster the entire time until dismissed by a judge. Posters can be put in place starting at 8am Thursday morning in the Corn Center. Poster clips to affix your poster to the presentation boards will be provided.

MOLECULAR & MICROBIOLOGY – GROUP 1

Poster #1	Alloco, Sydney. Upsilon Rho, St. John Fisher University. Investigation of Lactobacillus bulgaricus for analysis via Gas Chromatography.
Poster #2	Ladowitz, Paige. Xi Psi, Duquesne University. Do Mutations in a Nucleoid-Associated Protein Gene Suppress a Defect in Cell Division?
Poster #3	Noyal, Aiza. Tau Lambda, University of North Carolina, Charlotte. Investigating The Role of Mincle in Staphylococcal Osteomyelitis.
Poster #4	Weldon, Katelyn. Rho Theta, Thomas More University. Innovative and economical methods for analyzing colorimetric assay data.
Poster #5	Powers, Darren. Sigma Delta, Southwestern Oklahoma State University. <u>AMPK-Mediated Survival Strategies: A Study of Autophagy in Nutrient-Deprived Cancer</u> <u>Cells.</u>
Poster #6	McNally, Ross. Gamma, Western Colorado University. Protein powder analysis via spectroscopic methods and colorimetric assays.
Poster #7	Méndez, Arlinda. Zeta Lambda, University of Puerto Rico Aguadilla. The antagonist effects of Bacillus atrophaeus as a solution to Coffee Fruit Rot.
Poster #8	Thames, Dymond. Tau Eta, Catawba College. <u>Identification of Soil Microbiota Strains with Poly-3-hydoxybutyrate (PHB)-Degrading</u> <u>Capabilities.</u>
Poster #9	Jose, Sonia. Kappa Kappa, Augusta University. Involvement of the NF-kappaB and CXCL10 Signaling Pathways in Triple-Negative Breast Cancer Invasion.

MOLECULAR & MICROBIOLOGY – GROUP 2

Poster #10	Leach, Madylin. Theta Omega, Gannon University. The Role of SCAMP3 in Regulating CXCR4 Trafficking.
Poster #11	Broaddrick, Aimee. Gamma Mu, University of Wisconsin-Whitewater. Identifying Amyloidogenic Proteins in the Acrosomal Matrix of Human Spermatozoa.
Poster #12	Key, Mary-Kate. Tau Lambda, University of North Carolina at Charlotte.Cytosolic nucleic acid receptor-mediated detection of Staphylococcus aureuscontributes to protective interferon responses in murine osteoblasts.
Poster #13	Majithia, Krishna. Tau Lambda, University of North Carolina, Charlotte. Investigating the role of nucleic acid sensors in the production of protective type I interferons by human glial cells during bacterial meningitis.
Poster #14	Waltermire, Hunter. Theta Pi, University of Pittsburgh, Greensburg. <u>Effects of apoptosis pathways in C. elegans on development, lifespan, and removal of</u> <u>apoptotic cell corpses.</u>
Poster #15	Noble, Jacy. Tau Eta, Catawba College. Effect of UV Radiation on MCF-7 Breast Cancer Cells.
Poster #16	Oehler, Patrick. Sigma Theta, Texas Wesleyan University. <u>Characterization of a Coumarin-Substituted 1,2,4-Oxadiazole as a Novel Antifungal</u> <u>Agent.</u>
Poster #17	Haywood, Priscilla, Ren Thigpen. Beta Omega, Mercer University. <u>Characterization of Mutants and Mechanistic Insight Into Biofilm Biosynthesis in</u> <u>Streptococcus mutans.</u>
Poster #37	Soo, Todd. Epsilon Mu, Chapman University. Variance of Biondi Body amyloid morphology in human choroid plexus epithelial cells demonstrates Alzheimer's disease-related differences.

BIOMEDICAL SCIENCE

Poster #18	Hedden, Cole. Upsilon Rho, St. John Fisher University. An Examination of the Potentiation of Type 2 Topoisomerase Poisons by RLS Compounds in Acute Monocytic Leukemia.
Poster #19	Carley, Aidan. Sigma Tau, Florida State University. <u>Investigating the interaction of cannabidiol and an obesogenic environment on</u> <u>maternal behavior.</u>

Poster #20	Goodman, Dana. Eta Theta, Fairmont State University. Effect of Proline Residue during Insertion of pHLIP into Membrane.
Poster #21	Stonbraker, Madison. Theta Pi, University of Pittsburgh, Greensburg. Insight into how Jazf-1 regulates gene expression in the eye nervous system.
Poster #22	Liashenko, Varvara. Theta Omega, Gannon University. Obesity Epidemic: A review of Obesity and Diabetes Treatments.
Poster #23	Gonzalez, Karen. Tau Eta, Catawba College. Examining The Potential Antimicrobial Activity Of Azelaic Acid On The Eskape Pathogen Panel.

ECOLOGY & ENVIRONMENT

Poster #24	McMahon, Tyler. Omega Epsilon, Bradley University. Effects of Controlled Burning and Grazing on Macro-Moth Diversity in Illinois Tallgrass Prairie.
Poster #25	Walker, Chris. Phi Omicron, University of Northern Colorado. Changing colors: Using different color-measuring tools for avian coloration analysis.
Poster #26	Bateman, Bradley. Iota Theta, Missouri State University. Does a total solar eclipse elicit behavioral responses in bats? An acoustic survey.
Poster #27	Yupe, Nahara. Zeta Lambda, University of Puerto Rico Aguadilla. Selection of a specific aptamer for the detection of the pesticide Oxamyl.
Poster #28	Alcuitas, Altherr Joseph. Delta Sigma, Southwestern Oklahoma State University. Sexual selection in response to varying levels of cultural eutrophication.
Poster #29	Swanberg, Joel. Iota Delta Chi, Crown College. Good Gall-y! Field prevalence of gall-forming insects in Carver County, Minnesota.
Poster #30	Uhlig, Rachel Helen. Delta Sigma, Southwestern Oklahoma State University. Sexual selection in response to varying levels of cultural eutrophication.
Poster #31	Khan, Fiza. Mu Omicron, Columbus State University. Determining Population Density and Behavior of Ungulates in the Tuli Region using Game Drives.

ORGANISMAL

Poster #32	Nguyen, Oanh. Theta Pi, University of Pittsburgh, Greensburg. Brain morphology and gene expression changes of <i>Drosophila melanogaster</i> in the brain and nervous system resulting from misregulation of Jazf-1.
Poster #33	Degenhart, Ari. Sigma Tau, Florida State University. An Investigation Of Overmarking In A Neotropical Bird: The Lance-tailed Manakin.
Poster #34	Murphy. Kelsey. Theta Pi, University of Pittsburgh, Greensburg. The Effectiveness of Manuka Honey in Treating Staphylococcus aureus in C. elegans.
Poster #35	Sanchez, Ryan. Epsilon Gamma, Azusa Pacific University. Assessment of metabolic flexibility by RER in the Gromphadorhina portentosa.
Poster #36	Ebrahim, Merai. Epsilon Gamma, Azusa Pacific University. Assessment of metabolic flexibility by RER in the <i>Gromphadorhina portentosa</i> .

ORAL PRESENTATIONS

Oral presentations will be held in Frank Brown Hall on Thursday, May 30th, starting at 1PM. The three oral sessions will run concurrently. The presentation classrooms will be open by 12PM on Thursday so that students can upload their presentation file to the appropriate computer. There will be a break at 2:15PM with beverages available in the hallway area close to the classrooms. During the presentations, please try to avoid entering or exiting the room while a student is presenting. Please wait until the student has finished and enter/exit as quickly and as quietly as possible to minimize disruption.

MOLECULAR & MICROBIOLOGY

1:00 - 1:15PM	Drayna, Megan. Gamma Epsilon, Saint Mary's University of Minnesota. Incubation of Coliphage T4rII/AB with <i>Moringa Oleifera</i> Seed Extract Inhibited Phage Replication in <i>Escherichia coli</i> Host Cells.
1:15 - 1:30PM	Taylor, Mackenzie, Riley Lesko, Taylor Podob. Theta Pi, University of Pittsburgh, Greensburg. Effects of Lithium Chloride in <i>C. elegans:</i> A Potential Therapeutic Treatment for Huntington's Disease.
1:30 - 1:45PM	Echevarría Bonet, Emanuel. Zeta Lambda, University of Puerto Rico, Aguadilla. Inflammatory Cytokine Expression in White Blood Cells of Cows with Mastitis.
1:45 - 2:00PM	Pugh, Tiffany. Epsilon Gamma, Azusa Pacific University. Investigating the Role of the Zinc Finger Motif in SmMAK16 Protein in rRNA Binding.
2:00 - 2:15PM	Gresser, Michelle. Theta Pi, University of Pittsburgh, Greensburg. Weaving Through the Web of DMD: Using Spider Venom to Improve Muscular Movement in C. elegans.
2:15 - 2:30PM	BREAK
2:30 - 2:45PM	Golden, Shannon. Iota Psi, Hillsdale College. The Effects of Zingerone on Dental Caries-Causing Oral Bacterial Biofilm Formation.
2:45 - 3:00PM	Crookston, Justin. Theta Pi, University of Pittsburgh, Greenburg. <u>Roo and hopper Transposable Elements Responsible for Lobe Mutations in Drosophia</u> <u>melanogaster.</u>
3:00 - 3:15PM	Edwards, Jaliyah. Sigma Tau, Florida State University. Determining The Role Of Ddt4 In Paramutation Of The B1 Tandem Repeat In <i>Zea Mays.</i>
3:15 - 3:30PM	Mason, Grace. Sigma Tau, Florida State University. Mapping the connectivity of oxytocin receptor-expressing neurons within the dorsal tenia tecta of mice.

BIOMEDICAL SCIENCE

1:00 - 1:15PM	William, E. Frank. Zeta Kappa, University of Puerto Rico at Ponce. CRP and VEGF Effects on Endothelial Barrier Integrity: Implications for Atherosclerosis.
1:15 - 1:30PM	Wilson, Kristina. Upsilon Rho, St. John Fisher University. The role of cls-2 during chromosome segregation in C. elegans.
1:30 - 1:45PM	Schuster, Emma. Gamma Epsilon, Saint Mary's University of Minnesota. Assessment of gene expression profiling and functional prioritization of nuclear envelope genes in Alzheimer's disease.
1:45 - 2:00PM	Wise, Julia. Mu Omicron, Columbus State University. Exploring General Dentistry.
2:00 - 2:15PM	Hijazi, Mo. Epsilon Mu, Chapman University. Synthesis and characterization of ultra-low crosslinked hollow core nanogels for drug delivery applications.

ECOLOGY, ENVIRONMENT, & ORGANISMAL

1:00 - 1:15PM	Armstrong, Kira, Della Mamani. Theta Omega, Gannon University. A census of the bat population on the campus of Gannon University.
1:15 - 1:30PM	Cook, Brianna. Omega Epsilon, Bradley University. Katydid Audio Recording Units.
1:30 - 1:45PM	Wingard Byers, Molly Ann. Delta Sigma, Southwestern Oklahoma State University. Unseen Opportunity: Do Hermaphrodite Cues Influence Male-Male Aggression in Mangrove Rivulus Fish.
1:45 - 2:00PM	Reitz, Taylor. Xi Psi, Duquesne University. Characterizing Patterns of Skin Biofluorescence in the Desmognathus Family.
2:00 - 2:15PM	Ruiz, Daniel. Tau Eta, Catawba College. Real-life Zombies: Cordyceps in our Backyard?

ABSTRACTS

Abstracts are listed in alphabetical order by the last name of the primary author.

Alcuitas, Altherr Joseph. Delta Sigma, Southwestern Oklahoma State University. *POSTER PRESENTATION: ECOLOGY & ENVIRONMENT – POSTER #28* Sexual selection in response to varying levels of cultural eutrophication.

Sexually selected traits are expensive to build and maintain. This makes them condition-dependent and useful for making decisions about potential mates. However, the condition-dependence of these traits is also expected to make them hypersensitive to environmental change. We explored patterns of sexual selection in populations of amphipods in the genus *Hyalella* exposed to varying levels of nutrient pollution. These varying levels are likely due to fertilizer runoff from local farms. Higher levels of phosphorous, indicative of high nutrients, were predicted to lead to larger sexually selected traits, the posterior gnathopod (a claw-like trait) and second antenna. We collected amphipods from the lakes and compared male sexual trait sizes. We discovered that males collected from lakes with more nutrients tended to have larger sexual traits. Female choice may be compromised because poor quality males can build larger sexual traits. This could worsen the overall health of the population.

Alloco, Sydney, Dr. Theresa Westbay. Upsilon Rho, St. John Fisher University. *POSTER PRESENTATION: MOLECULAR & MICROBIOLOGY – POSTER #1* Investigation of Lactobacillus bulgaricus for analysis via Gas Chromatography.

The goal of this research was to characterize the types of bacteria found in various yogurt brands. Lactobacillus species are among the bacteria used to make yogurt. Differentiating Lactobacillus species is challenging. Aroma profiling has been used in some studies to distinguish between Lactobacillus species. Evaluation of the aroma profile can be done using gas chromatography. I am in the early stages of developing a protocol for using gas chromatography as a tool for characterizing the bacteria isolated from yogurt.

Armstrong, Kira, Della Mamani, Dr. Steven Ropski. Theta Omega, Gannon University. ORAL PRESENTATION: ECOLOGY, ENVIRONMENT & ORGANISMAL 1:00-1:15PM A census of the bat population on the campus of Gannon University.

For the past 15 summers, a census of the bat population has occurred on the Gannon University campus in Erie, PA. The numbers for the first three years held relatively steady, but the data for the past 9 years indicates a dramatic decline. White Nose Syndrome was first reported in 2006 in a cave in New York. The disease has killed an estimated 7 million bats in the eastern United States since then and has spread throughout Pennsylvania and into northeastern Ohio. This fungal infection has killed 95% of bats in some caves and may result in the listing of three bat species as endangered in Pennsylvania, including the Little Brown Bat (*Myotis lucifugus*), the predominant bat on the Gannon campus. This study will compare yearly data by building, time of year, building side and species composition to determine how White Nose Syndrome has affected the Gannon campus bats. A decrease in numbers may be partially responsible for an increase in West Nile Virus in the area. The results will also be used to place bat houses at appropriate locations to encourage bat presence on campus.

Bateman, Bradley, Giorgia Auteri. Iota Theta, Missouri State University. *POSTER PRESENTATION: ECOLOGY & ENVIRONMENTAL – POSTER #26* Does a total solar eclipse elicit behavioral responses in bats? An acoustic survey.

Solar eclipses draw global attention, not only from humans, but also other animals. However, due to the rarity of these astronomical events, there is little research into the effects of eclipses on animal behavior, although many crepuscular species have been shown to alter their activity during eclipse events. I have taken advantage of this rare phenomena in an attempt to understand how one such species—bats—may be affected. Ultrasonic acoustic recorders were deployed during the April 8th solar eclipse to passively record sounds of big brown bats (*Eptesicus fuscus*) in their roosts. Two roosts in the path of totality were sampled, with one located in Missouri and the other in Indiana. Call recordings were analyzed to compare social calls before, during, and following the eclipse. Implications of this study can be applied to understanding the environmental cues that cause bats to interrupt normal torpor/hibernation (for instance, understanding the degree to which environmental cues can override circadian rhythms). I hope this study will spark curiosity to further study these rare phenomena and their effects on bats.

Broaddrick, Aimee J. Gamma Mu, University of Wisconsin-Whitewater. POSTER PRESENTATION: MOLECULAR & MICROBIOLOGY – POSTER #11

Identifying Amyloidogenic Proteins in the Acrosomal Matrix of Human Spermatozoa.

Amyloids are proteins that aggregate into highly ordered cross-beta sheet structures under certain conditions. Amyloids are involved in neurodegenerative diseases such as Alzheimer's and Parkinson's. Lesser known is their presence in non-pathological pretenses. Recent studies have shown amyloids in the acrosomal matrix (tAM) and AM core of mouse, bull, and Rhesus macaque spermatozoa. These results strongly suggest that nonpathological amyloids may be physiologically important in the early events of mammalian fertilization and reproduction. My proposed research aims to discover the proteins likely to form amyloids *in vivo* in human spermatozoa. I used mass spectrophotometry analysis and bioinformatics to identify potential amyloidogenic proteins in the tAM and AM core, then compared my results with those found in mouse, bull, and Rhesus macaque spermatozoa. I hypothesized they would match closely. It is expected that results from my current study and previous ones will show that amyloid structures have been conserved through evolution and among species, including humans, and will strengthen the idea that functional amyloids play an important role in successful mammalian fertilization. These new findings will be useful for future research into the exact function of these amyloids and help improve the understanding of the mechanisms leading to successful fertilization.

Carley, Aidan. Sigma Tau, Florida State University. POSTER PRESENTATION: BIOMEDICAL SCIENCE – POSTER #19

Investigating the interaction of cannabidiol and an obesogenic environment on maternal behavior.

Cannabidiol (CBD) and an obesogenic environment were assessed for influences on maternal behavior, as well as other health metrics. Health organizations have highlighted rising rates of obesity in the United States as well as drug use during pregnancy. Because no investigators previously used an oral route of administration to deliver drug, we assessed pharmacokinetics in maternal plasma. We found that maternal blood plasma contained, on average, 371 ng/mL CBD within 30 minutes of eating the drug and levels remained elevated for 360 minutes (half-life = 60 minutes). CBD (100 mg/kg) or solvent (strawberry jam with ethanol) was provided once daily to the dam through gestation and lactation until offspring were weaned at postnatal day (PD) 22. On PD 5, 6, and 7, offspring were subjected to a pup retrieval assay. Time of complete retrieval was not significantly different across dam treatment groups (2-W ANOVA, p = 0.4248). Maternal body weight was significantly affected in females due to drug/dietary intervention (2-W ANOVA, p = 0.0198). Understanding such effects of CBD administration for maternal health metrics

during critical development periods for offspring, as well as maternal behavior is essential for insights to applications of modern medical treatments.

This work was supported by the Consortium for Medical Marijuana Clinical Outcomes research (MMCOR) of the State of Florida and the Higher Education Emergency Relief Funding (HEERF) through the CARES act. Funding was also provided by the FSU Honors Program through the Bess H. Ward Honors Thesis award.

Cook, Brianna. Omega Epsilon, Bradley University. ORAL PRESENTATION: ECOLOGY, ENVIRONMENT, & ORGANISMAL 1:15-1:30PM Katydid Audio Recording Units.

Katydids are ecologically quite important due to the diverse functional roles they play. However, their populations are declining due to habitat fragmentation and several unique challenges urbanization poses, such as light pollution and the urban heat island effect. We hypothesize that Katydids will vocalize less in urban areas due to increased chances of Hyperthermia. Vocalization is an energetically expensive process that increases thorax temperature. We also hypothesize that the Katydids will vocalize less in urban areas, as the light pollution increases the predation risk for the vocalizing katydid. To test our hypothesis, Autonomous Recording Units (ARUs) were dispersed proportionately in urban and protected areas in central Illinois. The number of ARUs distributed in each park is relative to the park's size. Using supervised machine learning models created in BirdNET, we are able to identify Katydid species as present or absent, then RavenPro software was used to analyze the katydid call. The determined files were compared between the protected and urban parks using the GLMM model in R. Preliminarily we have seen significant differences between park type, species, and frequency as well as time of call. We have also analyzed the data through alpha and beta diversity to determine species composition and structure.

Crookston, Justin. Theta Pi, University of Pittsburgh, Greenburg.

ORAL PRESENTATION: MOLECULAR & MICROBIOLOGY 2:45PM-3:00PM

Roo and hopper Transposable Elements Responsible for Lobe Mutations in Drosophia melanogaster.

Lobe alleles are variants of a mutated gene found in Drosophila melanogaster (the common fruit fly) that cause dysgenesis and shrinking of the eye. Lobe alleles have been studied for nearly a hundred years due to their distinct phenotypical alterations. It wasn't until a paper published in 2020 by Son & Choi that Lobe was finally located within the genome of D. melanogaster using RNAi and CRISPR knockdown and knockout respectively. Many Lobe alleles are caused by single base pair changes, large structural changes in the Lobe DNA, or by transposable elements such as roo and hopper. Our hypothesis is that unidentified mutations of Lobe such as LG and Lrm are caused by similar mechanisms. Two experiments were designed to run Lobe primers on various allelic backgrounds. The first experiment would detect large structural changes such as insertions or deletions that could be present in LG or Lrm mutants. The second would screen for roo or hopper transposons disrupting Lobe function in LG or Lrm. Through methods of DNA isolation, PCR, and gel electrophoresis, we were able to localize and identify the cause of LG mutations as a roo transposable element. The roo transposon, found in the non-coding region of Lobe is a definitive example of how distinct phenotypes may be generated by DNA mutations in regions that do not affect the protein sequence produced by Lobe.

Degenhart, Ari. Sigma Tau, Florida State University. POSTER PRESENTATION: ORGANISMAL – POSTER #33 An Investigation Of Overmarking In A Neetropical Bird: The Lance tailed Manakin

An Investigation Of Overmarking In A Neotropical Bird: The Lance-tailed Manakin.

Chemical cues play an important role in many animal behaviors. Overmarking, in particular, involves an individual leaving a scent mark to cover the scent of another, and is exhibited in many ways for a variety of potential purposes. While many studies of overmarking in mammals exist, very little is known about the

behavior in birds, which were historically assumed to lack a sense of smell up until just decades ago. To address this issue, we investigated the chemical signaling behavior of the Lance-tailed Manakin (Chiroxiphia lanceolata), a neotropical bird species. Pairs of male Lance-tailed Manakins perform cooperative courtship displays on a display perch, which they work together to maintain. During maintenance, we have observed behaviors involving individuals pecking at or wiping their bills on the display perch. Previous research in this system found that males responded to the manipulation of the chemical environment on the display perch by changing the rate they peck and swipe. Here, we investigated the hypothesis that pecking and bill-wiping behaviors at the display sites are forms of overmarking. We also tested non-exclusive alternate hypotheses that bill-wiping behavior is a form of nonchemical communication (i.e. visual or auditory), a displacement behavior in response to stress or excitement, or serves in physical preparation of the display perch. To determine if overmarking is involved, we analyzed videos of Lance-tailed Manakins at multiple display areas and recorded their response to ethanol treatments on the display perch. For each bout of activity, we broke down the different bill touch types, the groups and social statuses involved, and recorded the rate and frequency of pecks and bill swipes per individual. This ongoing study provides valuable insight into what factors relate to the pecking and swiping behaviors of male Lance-tailed Manakins, such as age, social status, and quantity of males in the area, and contributes to the understudied behaviors of avian response to chemical cues.

Drayna, Megan. Gamma Epsilon, Saint Mary's University of Minnesota. ORAL PRESENTATION: MOLECULAR & MICROBIOLOGY 1:00-1:15PM

Incubation of Coliphage T4rIIAB with *Moringa Oleifera* Seed Extract Inhibited Phage Replication in *Escherichia coli* Host Cells.

Extracts from some plants, including seeds of *Moringa oleifera* (the Drumstick Tree), contain compounds effective at inhibiting bacterial and viral growth. This suggests extracts from seeds of *M. oleifera* could be used to inhibit the growth of bacteria and viruses that cause human disease. The purpose of this study was to reconfirm whether *M. oleifera* seed extract was effective at inhibiting the replication of a virus, particularly the bacteriophage, Coliphage T4rIIAB. Phage were exposed to *M. oleifera* seed extract or deionized water for 24 hours, mixed with the host cell, *Escherichia coli* B, spread on agar plates, and the plates were incubated at 37 °C for 24 hours to allow for bacterial growth and phage plaque formation. The number of plaque forming units were counted. Results indicated that the number of plaque forming units formed by phage incubated with *M. oleifera* seed extract was lower than the number of plaque forming units was statistically significant, indicating that *M. oleifera* seed extract was effective at inhibiting viral growth and could potentially be used as an agent to inhibit the growth of viruses that are of human concern.

Ebrahim, Merai. Epsilon Gamma, Azusa Pacific University. POSTER PRESENTATION: ORGANISMAL – POSTER #36 Assessment of metabolic flexibility by RER in the *Gromphadorhina portentosa*.

Metabolism is the series of chemical reactions utilized by organisms to create energy to drive physiological and cellular functions. Understanding the metabolism of ectothermic organisms has been an area of interest that is widely understudied with limited model organisms. Using the *Gromphadorhina portentosa* (Giant Madagascar Hissing Cockroach) as a model organism, ectothermic metabolism was measured by respirometry using a closed animal chamber and iWorx gas analyzer. The metabolic rate was calculated as the Respiratory Exchange Ratio (RER). Experiments were conducted to study allometry, sexual dimorphism and the effects of high temperatures, exercise and differing diets on the metabolic rate of *G. portentosa* compared to control. The data showed significant changes in RER under several of these experimental conditions. To supplement our gas analysis, we utilized biochemical assays to elucidate why several experimental groups exhibit RERs >1.0. Preliminary results show glucose and triglyceride levels in hemolymph accommodate metabolic flexibility requirements in the above experimental conditions. This work represents the most comprehensive evaluation of this ectotherm and adds to our understanding of one of the largest insects.

Echevarría Bonet, Emanuel, J. Pérez Laspiur. Zeta Lambda, University of Puerto Rico, Aguadilla. ORAL PRESENTATION: MOLECULAR & MICROBIOLOGY 1:30-1:45PM Inflammatory Cytokine Expression in White Blood Cells of Cows with Mastitis.

Mastitis is a chronic inflammatory disease of the mammary gland responsible for cessation of lactation in humans, and the most common disease leading to economic losses in the dairy industry. In developing countries with scarce resources, mastitis threatens neonatal development and malnutrition. It is hypothesized that the detrimental effects of mastitis is a result of systemic unregulated over expression of inflammatory cytokines. This study aims to characterize the mRNA expression profile of known inflammatory cytokines thought to be involved in the mastitis inflammatory process. A pilot study was conducted using a bovine model of mastitis (n=6) to investigate changes in inflammatory cytokine profile during mastitis compared to healthy individuals. Briefly, white blood cells were isolated and total RNA extracted using TRIzol. First-strand cDNA synthesis was performed followed by PCR amplification of TNF-alpha, IL-1B, IL-6, IL-8, IL-10 and B-actin as normalizing control. Preliminary results suggest an upregulation of IL-1B and IL-8 in white blood cells of cows with mastitis, confirming the chronic inflammatory status of cows with mastitis. Next steps include qReal-Time PCR and western blot analysis of inflammatory cytokines and immunomodulators in mammary tissue.

Edwards, Jaliyah, K. Koirtyohann, J. Scott, K. McGinnis. Sigma Tau, Florida State University. *ORAL PRESENTATION: MOLECULAR & MICROBIOLOGY 3:00PM-3:15PM* Determining The Role Of Ddt4 In Paramutation Of The B1 Tandem Repeat In *Zea Mays.*

In Zea mays, a network of chromatin binding proteins interacts with the booster 1 gene locus (*b1*) tandem repeat (*b1TR*) to influence *b1* expression. Prior research suggests DDT4 may be one of these interacting proteins, and we are currently testing the DNA binding ability of the protein to this sequence by performing a yeast one-hybrid assay. The results of this experiment will contribute to the growing data the scientific community has on the complex RNA-directed epigenetic processes in plants. We used the commonly used plasmid vectors pLacZi and pEXP-AD502 as backbones for our bait and prey constructs respectively. The DDT4 yeast construct was built via Gibson assembly, sequenced via Primordium, and purified via gel purification. We utilized three positive control prey plasmids (PVC mieszko, cibur, and stojgniew). The Saccharomyces cerevisiae (bakers' yeast) RTY330 strain was successfully transformed with these plasmids through our collaboration with the Yu Lab, which specializes in yeast research. Using the colony lift procedure to introduce the X-Gal substrate to the colonies for the blue-white screening, the presence of positive blue yeast colonies for the positive controls and the experimental indicates DDT4's binding ability and relationship to the b1TR. Additional experiments using negative controls to further validate our results are ongoing. This work is supported by the laboratory of Dr. Karen McGinnis.

Emmanuel, Tina, Dymond Thames, Ana Price, Yahaira Galan-Cruzes, Ben Bielby. Tau Eta, Catawba College.

POSTER PRESENTATION: MOLECULAR & MICROBIOLOGY – POSTER #8

Identification of Soil Microbiota Strains with Poly-3-hydoxybutyrate (PHB)-Degrading Capabilities.

The continual pollution of our environment with polymer plastic derivatives has made it increasingly important to find contemporary approaches for plastic and microplastic decontamination. Recent novel

investigations have identified microbial partners in our environment capable of degrading a variety of plastic polymers, such as polyethylene, polyester and poly-3-hydroxybutyrate (PHB). We therefore sought to survey microbial communities from our Catawba College campus to determine if resident microbiota may possess enzymes capable of degrading PHB. Samples were collected, and diluted if needed, before being inoculated onto PHB-infused Nutrient agar plates according to procedures set forth by Egusa et. al. (2018). Several PHB-degrading strains were isolated, axenically cultured and analyzed for enzymatic activity, followed by genotyping analysis using 16S barcoding. Nine species were genetically identified that showed PHB degradation, with rates that ranged from 0.0006 – 0.0150 mg/ml/min. Of the 9 species, 5 have been reported previously to demonstrate PHB degradation, while 4 of the 9 are novel. Future work will continue to investigate the potential synergistic effect of PHB-degraders in mixed cultures. The enzymatic breakdown of PHB presents an opportunity to explore this concept of biologically degraded plastics as a solution to the disastrous global plastic waste problem.

Golden, Shannon. Iota Psi, Hillsdale College.

ORAL PRESENTATION: MOLECULAR & MICROBIOLOGY 2:30-2:45PM

The Effects of Zingerone on Dental Caries-Causing Oral Bacterial Biofilm Formation.

Dental caries is the most prevalent childhood disease, affecting nearly 30% of children worldwide. Caries occur when oral bacteria form biofilms on tooth surfaces and produce acidic byproducts from residual metabolites. While regular brushing and mouth washes are effective measures for some, additional preventative methods are needed to decrease caries in individuals colonized by aggressive biofilm-forming species. Previous research has demonstrated that zingerone interrupts quorum-sensing in other bacterial species, preventing communication and coordination of gene expression. This project investigated if zingerone, a component of ginger, reduces biofilm formation in the oral bacteria *Streptococcus mutans* and *Lactobacillus gasseri*. Each bacterial species was grown and placed in a Drip Flow Biofilm Reactor and treated with a diluted media and zingerone solution. Biofilm formation was analyzed using a confocal microscope and Live/Dead stain. Although biofilm formation decreased with zingerone treatment, there was not a significant difference between experimental and control groups. However, this research models the dynamic environment of medical treatments and can be used as a stepstone between traditional static biofilm assays and clinical trials. Additional trials with increased sample size may reveal zingerone's ability to significantly decrease biofilm growth in *Streptococcus mutans* and *Lactobacillus gasseri*.

Gonzalez, Karen, Carmony Hartwig. Tau Eta, Catawba College. POSTER PRESENTATION: BIOMEDICAL SCIENCE – POSTER #23

Examining The Potential Antimicrobial Activity Of Azelaic Acid On The Eskape Pathogen Panel.

Skin and soft tissue infections (SSTIs) are among the most common skin conditions in primary care (Ramata-Stunda et al. 2023). Acne, characterized by 'clogging' of pores by sebum often around hair follicles, has been linked to the presence of specific bacterial species, namely *Cutibacterium acnes*, which is said to be a slow-growing, aerotolerant anaerobic, gram-positive, rod-shaped bacterium (Bhatia et al. 2016). Traditional therapeutic approaches for the treatment of acne consist of topical (i.e., retinoids and antibiotics), systemic (i.e., retinoids, antibiotics, and hormonal), and physical therapies (Sender et al. 2016). Not all therapies may be suitable for long-term use, and some may even cause undesired side-effects. Treating skin conditions such as acne, or other bacterially involved infections may be extremely difficult, especially if they are caused by pathogenic species that may be resistant to multiple commonly used antibiotics. Notably, there has been an increase in reported antibiotic-resistant strains of *C. acnes*, further demonstrating the need for additional, effective, and safe antimicrobial compounds for the successful treatment of individuals suffering from this SSTI. Recent research suggests that novel compounds such as azelaic acid, a naturally-derived saturated dicarboxylic acid may be effective in treating

pathology associated with acne. With the understanding that antibiotic compounds have the greatest potency against bacteria that may be a source of acne in the skin, this activity is negated when used on resistant strains. While azelaic acid has demonstrated positive effects that lead to improved condition of skin tissue suffering from acne, its general antimicrobial activity against ESKAPE (*Enterococcus faecium, Staphylococcus aureus, Klebsiella pneumoniae, Acinetobacter baumannii, Pseudomonas aeruginosa,* and *Enterobacter* sp.) pathogens remains largely unknown. This study will aim to prepare and test different concentrations (5-20%) of azelaic acid against the ESKAPE pathogen panel to explore the potential for its chemotherapeutic use against other bacterial strains, particularly those that are increasingly demonstrating antibiotic resistance. The proposed hypothesis of this research is that increasing concentrations of azelaic acid (specifically within levels commercially available ~10-12%) will significantly inhibit bacterial growth of ESKAPE pathogens, as demonstrated through a standard Zone-of-Inhibition (ZOI) assay.

Goodman, Dana, and Dr. Ganga Sharma. Eta Theta, Fairmont State University. *POSTER PRESENTATION: BIOMEDICAL SCIENCE – POSTER #20*

Effect of Proline Residue during Insertion of pHLIP into Membrane.

The pH Low Insertion Peptide (pHLIP) technology has garnered significant attention for its potential in targeted drug delivery and imaging applications. Proline, an amino acid known for its unique conformational properties, plays a crucial role in the behavior and effectiveness of pHLIP. We explore the effect of proline position within pHLIP sequences when it is in transmembrane orientation. Using theoretical mathematic methods already developed, we elucidate how the positioning of proline residues influences the peptide's ability to insert into cell membranes at low pH environments. Additionally, we discuss the implications of proline positioning on the structural dynamics and functional properties of pHLIPs, shedding light on opportunities for optimizing their performance in biomedical applications. Understanding the relationship between proline position and pHLIP functionality provides valuable insights for the design and development of novel peptide-based delivery systems with enhanced efficacy and specificity.

Gresser, Michelle, Jazmin Farabaugh, Dr. Olivia Long. Theta Pi, University of Pittsburgh, Greensburg. ORAL PRESENTATION: MOLECULAR & MICROBIOLOGY 2:00-2:15PM

Weaving Through the Web of DMD: Using Spider Venom to Improve Muscular Movement in C. elegans.

Duchenne Muscular Dystrophy (DMD) is the most common form of muscular dystrophy; the gene affected encodes dystrophin, a protein used for muscular cell membrane stability. There is no current cure. *Caenorhabditis elegans (C. elegans)* is a common model organism for human diseases due to its entire genome being fully discovered and its short lifespan (~3 weeks) is ideal for undergraduate research. Currently, Muscular Dystrophy has been modeled in *C. elegans* and a variety of work has been completed including understanding the disease and testing different treatments. Gingerol is a compound found in ginger that is responsible for its pungent scent, spice, and is commonly used for medicinal purposes. GsMTx-4 is an isolated protein from Chilean rose tarantula venom. Previous research has found that this toxin blocks pain receptors during inflammatory responses and mechanical pain. There are significant research gaps with studies using Gingerol and GsMTx-4 as treatments and its general effect on *C. elegans*; neither have utilized the DMD model. This study hopes to shed light on the potential use of both as treatments for DMD in worms. It will focus on determining if phenotypes (eggs laid, muscle movement and development) change upon treatment in wild-type and DMD animals.

Haywood, Priscilla, Ren Thigpen. Beta Omega, Mercer University. *POSTER PRESENTATION: MOLECULAR & MICROBIOLOGY – POSTER #17* Characterization of Mutants and Mechanistic Insight Into Biofilm Biosynthesis in *Streptococcus mutans*.

Biofilm formation has been implicated in the resistance to antimicrobial agents and pathophysiology of various bacterial pathogens, including *Streptococcus mutans*. This study aimed to identify and characterize *S. mutans* mutants displaying reduced biofilm formation. Strains of *S. mutans* were mutated using Acridine Orange. Congo Red assays were conducted to screen for differences in biofilm biochemical makeup in order to identify potential mutants. Crystal Violet assays were then performed to quantify each strain's biofilm production; three mutants with reduced biofilm production were identified: BG-C2, BG-A1, and B&B#2. Growth curves demonstrate that the mutations present in two of these three lines, BG-A1 and B&B#2, did not significantly affect the bacteria's doubling times relative to wild-type, suggesting the reduction in biofilm is due to a mutation in the biofilm biosynthesis pathway and not an inability to reach quorum. Next, isolated DNA from the selected strains was sent for genomic sequencing. The sequenced mutant genomes were compared to that of wild-type *S. mutans* to identify the mutated genes involved in the biofilm pathway. Identifying genes related to biofilm production in *S. mutans* will enhance the understanding of how this species produces biofilm. Understanding these pathways will facilitate the development of targeted drug therapies to inhibit biofilm production, thus making infections easier to manage and reducing the spread of antibiotic-resistant plasmids.

Hedden, Cole. Upsilon Rho, St. John Fisher University. POSTER PRESENTATION: BIOMEDICAL SCIENCE – POSTER #18

An Examination of the Potentiation of Type 2 Topoisomerase Poisons by RLS Compounds in Acute Monocytic Leukemia.

Topoisomerase II (TOP2) is an enzyme critical for proper DNA replication and transcription. It functions by creating transient double-stranded breaks of the DNA sugarphosphate backbone and re-ligating the strands to correct overwinding and underwinding of the DNA double helix. Doxorubicin is known to enhance the number of cleavage complexes in cancer cells, leaving DNA irreparable, leading to cell death. TOP2 poisons, like doxorubicin, have shown to be effective chemotherapy treatments but, over time, can have cardiotoxic effects. Research shows that some replicative lifespan-shortening (RLS) compounds can potentially enhance the potency of TOP2 poisons like doxorubicin. When combined with doxorubicin, RLS compounds can enhance cell death by up to fivefold in human fibrosarcoma cells but not in healthy cells. This project investigates the effect of a novel RLS compound on human Acute Monocytic Leukemia cells (AML-193). AML-193 cells were cultured using standard growth techniques and experimented on using novel RLS compounds combined with doxorubicin. The novel RLS compound was found to increase the potency of doxorubicin. leading to a significant increase in AML-193 cell death. The RLS compound alone was not found to significantly affect cell viability. A combination of doxorubicin and RLS compounds has the potential to increase the potency of doxorubicin when administered to humans, leading to a shorter treatment duration, lowering cardiotoxic side effects.

Hijazi, Mo. Epsilon Mu, Chapman University. ORAL PRESENTATION: BIOMEDICAL SCIENCE 2:00-2:15PM

Synthesis and characterization of ultra-low crosslinked hollow core nanogels for drug delivery applications.

Nanogels have emerged as a notably safer and more effective means for drug delivery, primarily due to their adjustable drug-loading capabilities. Hollow-core nanoparticles offer some unique properties that are desirable for drug delivery applications. Initially, silica core nanoparticles were synthesized using the Stöber process at different temperatures where Tetraethoxysilane (TEOS) undergoes hydrolysis in the

presence of ethanol and then a condensation reaction to form silica nanoparticles. Scanning Electron Microscopy (SEM) and Optical Microscopy (OM) analysis revealed that the size of silica core particles varied with the synthesis temperature (300 nm at 30°C to 150 at 60°C). The core silica particles were first coated with 3-(Trimethoxysilyl)propyl methacrylate (MPS) layers and used as seeds to grow ultra-low-cross linked thermoresponsive poly(N-isopropyl acrylamide) (NIPAm) shells using surfactant-free emulsion polymerization reaction. SEM and OM (differential contrast Interference Contrast) confirmed the addition of the NIPAm shell. The core was dissolved to get hollow shell nanogels. These hollow shell nanogels are very good candidates for drug delivery applications due to the presence of a hollow compartment in their structures.

Jose, Sonia. Kappa Kappa, Augusta University. POSTER PRESENTATION: MOLECULAR & MICROBIOLOGY – POSTER #9 Involvement of the NF-kappaB and CXCL10 Signaling Pathways in Triple-Negative Breast Cancer Invasion.

Triple-negative breast cancer (TNBC) is an aggressive subtype of breast cancer that is prevalent in younger and minority women. Tumor-associated macrophages (TAMs) can compose up to 50% of the TNBC tumor microenvironment and play a significant role in tumor growth and metastasis. This study aimed to better understand how the nuclear factor-kappaB (NF-κB) signaling pathway in TAMs influences TNBC metastasis. We hypothesized that the inactivation of the canonical NF-κB pathway would reduce TNBC invasion. For this study, p65 knockout and control bone marrow-derived macrophages (BMDMs) were co-cultured with TNBC cells for 48 hours. The TNBC cells were then used in a 24-hour invasion assay to quantify the number of invaded TNBC cells from various culture conditions. Based on the invasion assay, we concluded that a significant decrease in TNBC invasion occurred when the TNBC cells were co-cultured with p65 knockout macrophages. Additionally, cell invasion increased with the presence of pro-tumor cytokines released by BMDMs. This study has allowed us to better understand the role of macrophage NF-κB influence on TNBC.

Key, Mary-Kate, Samantha Suptela, Ian Marriott, M. Brittany Johnson. Tau Lambda, University of North Carolina at Charlotte.

POSTER PRESENTATION: MOLECULAR & MICROBIOLOGY – POSTER #12

Cytosolic nucleic acid receptor-mediated detection of Staphylococcus aureus contributes to protective interferon responses in murine osteoblasts.

Osteomyelitis is an inflammation of the bone due to infection, with approximately 80% of cases caused by the bacterial pathogen Staphylococcus aureus. It is now appreciated that the resident bone building cells, osteoblasts express pattern recognition receptors (PRRs), that are responsible for pathogen recognition and initiation of immune responses. We have recently reported that S. aureus infected osteoblasts produce type I interferons that limit intracellular bacterial burden. However, the mechanism underlying initiation of interferon responses by osteoblast is uncharacterized. In this study, we address the hypothesis that PRR detection of S. aureus by osteoblasts promotes initiation of protective interferon responses. We first examined expression of the cytosolic nucleic acid sensors, retinoic acid inducible gene-1 (RIG-I) and cyclic GMP-AMP synthase (cGAS) in murine osteoblasts. Our results indicate that osteoblasts have low constitutive expression of these sensors that is further elevated following S. aureus infection. Next, we examined the role of these sensors during S. aureus infection of osteoblasts using an siRNA approach to knockdown protein expression of RIG-I and cGAS. Knockdown of RIG-I and cGAS resulted in a significant reduction of interferons released by osteoblasts following bacterial challenge. Our data show that both RIG-I and cGAS significantly contribute to interferon production by infected osteoblasts, and suggest a role for these nucleic acid sensors in limiting bacterial burden. Taken together, this data indicates that RIG-I and cGAS contribute to osteoblast responses to S. aureus challenge and could be potential targets for future therapeutic interventions in osteomyelitis.

Khan, Fiza. Mu Omicron, Columbus State University. POSTER PRESENTATION: ECOLOGY & ENVIRONMENT – POSTER #31 Determining Population Density and Behavior of Lingulates in the Tuli Region

Determining Population Density and Behavior of Ungulates in the Tuli Region using Game Drives.

Understanding the population dynamics and densities across different microhabitats within an area can be advantageous for both ecological research and wildlife management. Game drive counts are a method which can be used to compare the number of individuals of varied species within a certain area. Observers drove from one side of a predetermined route, counting the different species in the desired ranges. The number of animals found helps researchers compare population densities from previous years to better understand species demographics temporally. Comparing population densities in different locations helps observers understand the relationship between species density and the richness of their habitats. The results of a game drive may also help researchers defend claims on how species behavior can be shaped by their environment.

Ladowitz, Paige, Sophie Kopyar, Daniel Fromuth, Joseph McCormick. Xi Psi, Duquesne University.

POSTER PRESENTATION: MOLECULAR & MICROBIOLOGY – POSTER #2

Do Mutations in a Nucleoid-Associated Protein Gene Suppress a Defect in Cell Division?

Streptomyces are filamentous, Gram-positive bacteria that provide antibiotics and biologically active compounds for medical uses. A Streptomyces coelicolor ftsQ mutant (important in cell division and efficient sporulation), accumulates multiple suppressor mutations. One group of those suppressor mutations is in lsr2, but those strains have additional mutations in other genes. Lsr2 is a nucleoid-associated protein (homolog to E. coli H-NS) that organizes DNA and also acts as a transcription factor. The main goals of this project are to demonstrate lsr2 suppresses ftsQ by deleting lsr2, deleting ftsQ, and then integrating a copy of the point mutations of lsr2 at a non-native location. Methods used to achieve these goals included interspecies conjugation, recombineering, polymerase chain reaction, and gel electrophoresis. I have isolated two lsr2 deletion strains, which I will be integrating the ftsQ deletion strain into. Once I have confirmed those strains, I will be integrating the lsr2 point mutant alleles at the attB_{ΦBTI} site to determine if mutations in lsr2 do suppress the deletion of ftsQ.

Leach, Madylin, Jordyn Gaines, Della Manani, Dr. Quyen Aoh. Theta Omega, Gannon University. *POSTER PRESENTATION: MOLECULAR & MICROBIOLOGY – POSTER #10* The Role of SCAMP3 in Regulating CXCR4 Trafficking.

CXCR4 is a chemokine G-protein coupled receptor that plays a large role in cell movement, differentiation, and cell growth and division. Binding of the agonist, CXCL12, to CXCR4, causes it to be endocytosed and then tagged for degradation within the cell. CXCL12 also activates internal signaling cascades of chemotactic movement, cell proliferation, and differentiation. *In vivo*, failure to degrade CXCR4 by the lysosome promotes metastasis. In this study we will determine whether CXCR4 trafficking to the lysosome for degradation is affected by the Secretory Carrier Membrane Protein (SCAMP3). Previous studies have shown that SCAMP3 is involved in the recycling of EGFR and interacts with ESCRTs trafficking from the endosome to the lysosome. To determine if SCAMP3 regulates CXCR4 trafficking we will use immunofluorescence assay to monitor trafficking of cell-surface HA-tagged CXCR4 receptor in the endosomes, and the lysosomes. RNA interference will be used to knockdown SCAMP3 and examine its effects on the colocalization of CXCR4 and the endosome and lysosome at specific time intervals. Additionally, we will examine CXCR4 degradation via Western blotting in the cells where SCAMP3 is also knocked down using RNA interference.

Liashenko, Varvara, Prasad Dalvi. Theta Omega, Gannon University. *POSTER PRESENTATION: BIOMEDICAL SCIENCE – POSTER #22* Obesity Epidemic: A review of Obesity and Diabetes Treatments.

Diabetes mellitus (DM), once a relatively contained health concern, is now rapidly spreading globally, and becoming an alarming pandemic. DM is a chronic condition in which glucose homeostasis is impaired due to either the pancreatic β -cells being unable to produce enough insulin that leads to type 1 DM, or the secreted insulin being ineffective because of peripheral or central insulin resistance that leads to type 2 DM. The mortality rates associated with DM are also rising worldwide. As the diabetes pandemic continues to escalate, it becomes increasingly crucial to pinpoint the underlying causes driving its growth so that effective measures can be taken to prevent its progression. One of the leading causes of the development of type 2 DM is obesity, which is defined as excessive or abnormal accumulation of fat or adipose tissue in the body that can impair glucose homeostasis. As such, more than 90% of patients with diabetes are either overweight or obese, and therefore, it is imperative to understand how to treat obesity and diabetes in these patients either through lifestyle modification or medication. Many pharmaceutical and surgical approaches are available for treating obesity and diabetes. A review of these treatment options, the underlying mechanisms, potential complications, and the overall outcomes of these treatments warrants further investigation for proper management of these conditions.

Majithia, Krishna, Dr. M. Brittany Johnson. Tau Lambda, University of North Carolina, Charlotte. *POSTER PRESENTATION: MOLECULAR & MICROBIOLOGY – POSTER #13*

Investigating the role of nucleic acid sensors in the production of protective type I interferons by human glial cells during bacterial meningitis.

Bacterial meningitis is the cause of 1.2 million cases of meningitis globally and contributes to 250,000 deaths each year. Meningitis is an infection of the meninges which provide protection to the brain and spinal cord, but bacterial infection can also progress to encephalitis, an infection of the brain itself. Meningitis and meningoencephalitis cause a potent inflammatory response, potentially leading to lifethreatening injuries. Statistics have shown that if untreated, one in five cases results in death with 20% of survivors experiencing permanent neurological damage. Neisseria meningitidis is a gram-negative, commensal bacterium that resides in the nasopharynx and causes roughly 42% of all meningitis cases. Previous data indicates that in response to N. meningitidis infection, resident cells in the central nervous system (CNS) including microglia and astrocytes, recognize pathogen-associated molecular patterns (PAMPs) via host pattern recognition receptors (PRRs), leading to the release of immune mediators that contribute to potent neuroinflammation. Recent data suggests a novel role for nucleic acid sensors including retinoic acid-inducible gene (RIG-I) and cyclic GMP-AMP synthase (cGAS) in the identification of bacterial nucleic acids, leading to the production of type I interferons (IFNs). While type I IFNs are primarily known for their antiviral effects, it is becoming increasingly evident that they function more broadly during bacterial infection as well. As such, we hypothesize that type I IFNs may provide protective effects in resident CNS cells during meningitis. Our preliminary data shows that treatment with IFN-B significantly reduces bacterial viability and contributes to increased survival of host cells. This supports a protective role for type I IFNs during bacterial infection of resident CNS cells. Our ongoing studies will determine if RIG-I and cGAS-mediated identification of *N. meningitidis* contributes to the production of protective IFN responses during meningitis.

Mason, Grace. Sigma Tau, Florida State University. ORAL PRESENTATION: MOLECULAR & MICROBIOLOGY 3:15PM-3:30PM Mapping the connectivity of oxytocin receptor-expressing neurons within the dorsal tenia tecta of mice.

The dorsal tenia tecta (DTT) is an understudied region of the primary olfactory cortex implicated in psychosocial stress responses. Prior research into this region's connectivity has indicated innervations with regions involved in stress, memory, and olfactory processing (Cousens et al., 2020). The goal of this project was to analyze the connectivity of oxytocin receptor-expressing neurons within the DTT. Previous studies have determined that the DTT exhibits a high density of oxytocin receptors. At postnatal day 7, oxytocinreceptor expression is higher than 95% of other brain regions (Newmaster et al., 2020). Since oxytocin plays a significant role in regulating endocrine, autonomic, and behavioral stress responses, mapping the connectivity of this potentially important DTT cell-type is a critical step to understanding its function. A flexed AAV viral tracer was injected into the DTT of a transgenic mouse strain expressing cre recombinase in all oxytocin receptor-expressing neurons. This Cre-Lox approach allows us to specifically label the cell body and processes of this cell group with a fluorescent reporter. After a three-week incubation period, mice were transcardially perfused and the brain was removed and serially sectioned on a cryostat. The resulting slides were imaged using an epifluorescent microscope. Images were registered to the Allen Brain Atlas using ABBA (Aligning Big Brains and Atlases) software. The registered brain sections were imported into QuPath, and analyzed for the presence and density of fibers in each brain region. The elucidation of these connections play a critical role in developing hypotheses regarding the function of oxytocin in the DTT.

McMahon, Tyler. Omega Epsilon, Bradley University. POSTER PRESENTATION: ECOLOGY & ENVIRONMENT: POSTER # 24 Effects of Controlled Burning and Grazing on Macro Moth Diversity in Illinois Talla

Effects of Controlled Burning and Grazing on Macro-Moth Diversity in Illinois Tallgrass Prairie.

Globally, invertebrates have seen a decline in species diversity and abundance. Pre-agriculture, Illinois was 80% tallgrass prairie, which supported most arthropod diversity. Insects such as moths (Lepidoptera) are critical to food chains, soil formation, pollination, and nutrient cycling. Restoration efforts have been implemented to restore the Illinois Tallgrass Prairie, such as protected areas, urban parks, and wildlife preserves. Controlled burns and grazing of herbivores are implemented to maintain prairies and promote high species diversity. This study shows the effects of grazing from American Bison and controlled burning of prairies on Macro-moth diversity in Nachusa Grasslands. Blacklight traps were placed in various prairie management types to capture moths in prairies. The captured specimens were identified and compared to calculate diversity and abundance between sites. The results show significant differences between grazed and burning areas hosting the most species diversity. Understanding prairie management can create effective protected areas and offset the Arthropod decline.

McNally, Ross. Gamma, Western Colorado University. *POSTER PRESENTATION: MOLECULAR & MICROBIOLOGY – POSTER #6* Protein powder analysis via spectroscopic methods and colorimetric assays.

Supplement use has become increasingly popular in the fitness industry in recent years, with a plethora of products claiming to increase muscle growth, stamina, and overall quality of workouts. The quality of the supplements on the market can vary widely, prompting consumers and regulatory agencies alike to seek out reliable methods of supplemental analysis of both chemical composition and potential biological relevance in the body. Here, we seek to provide a comprehensive analysis of several popular protein powders utilizing spectroscopic and colorimetric assays. Given the turbulent track records of many supplement companies who have been found to make products with inaccurate labels, we seek to identify and quantify discrepancies between product contents and provided labels. Additionally, we seek to use

enzyme-linked immunosorbent assays (ELISA) to determine degree of cross contamination which may be present from other sources. In these studies, a variety of exercise supplements, including different brands and formulations, will be collected to determine the presence of active ingredients, accuracy of labels, and potential contaminants. These studies seek to provide valuable information for consumers, regulatory bodies, athletes, and supplement manufacturers in the sports and nutrition industries, with the aim to improve the transparency and reliability of popular exercise supplements overall.

Méndez, Arlinda, & Alondra Colón. Zeta Lambda, University of Puerto Rico Aguadilla. POSTER PRESENTATION: MOLECULAR & MICROBIOLOGY – POSTER #7

The antagonist effects of Bacillus atrophaeus as a solution to Coffee Fruit Rot.

Coffee, one of the most consumed agricultural products in Puerto Rico, is plagued by a disease called Coffee Fruit Rot caused by the genera of fungi *Colletotrichum* and *Fusarium*. The use of fungicides has been limited due to their contribution to fungal resistance and potential hazards to human health. However, *Bacillus atrophaeus* is one of the organisms that has shown a high ability to control fungi growth under in vitro conditions. This proposal aims to evaluate the inhibitory effects of *Bacillus atrophaeus* against *Colletotrichum* and *Fusarium*. To achieve this, fungi and bacteria will be cultured individually in a media designed to support their growth and proliferation. The bacteria's secondary metabolites with antifungal properties will be extracted from the media culture. Later, the fungi will be exposed to the bacteria's secondary metabolites. The inhibitory effect of the secondary metabolites will be analyzed by evaluating the fungi's mycelial growth and conidial germination development. The same technique will be implemented on healthy and infected coffee berries to examine the direct antifungal effects of the bacterial secondary metabolites. The goal is to take advantage of *Bacillus atrophaeus* antagonistic properties as an eco-friendly alternative to decrease the amount of coffee crop loss in the future.

Murphy. Kelsey, Dr. Olivia Long. Theta Pi, University of Pittsburgh, Greensburg. *POSTER PRESENTATION: ORGANISMAL – POSTER# 34*

The Effectiveness of Manuka Honey in Treating Staphylococcus aureus in C. elegans.

Methicillin-Susceptible *Staphylococcus aureus* (MSSA) is a gram-positive bacterium that is a growing public health issue. *Caenorhabditis elegans*, commonly known as *C. elegans*, are microscopic nematodes with a short lifespan and a completely sequenced genome. In *C. elegans* and humans, the intestinal epithelial cells are similar in morphology, structure, and function. The innate immune system is also comparable, which makes *C. elegans* a good model organism to study bacterial pathogenesis. Currently, studies show that *C. elegans* fed MSSA die over a period of several days due to an abundant accumulation of bacteria in the alimentary tract. Manuka honey, native to New Zealand, is known for its antibacterial properties due to its high methylglyoxal concentration, low pH, and phytochemicals. Studies have shown that Manuka honey disrupts the metabolic processes and membrane potential of *Staphylococcus aureus*, by inhibiting bacterial growth and spread. Manuka honey and *Staphylococcus aureus* have not been studied together in *C. elegans* but have potential for future research into antibiotic resistance. This study seeks to discover the effects of Manuka honey against MSSA and will focus on determining any changes in phenotypes (longevity, development, and fluorescent imaging) in both wild-type and experimental strain animals exposed to MSSA and Manuka honey.

Nguyen, Oanh, Laila Smith, and Matthew Logan Johnson. Theta Pi, University of Pittsburgh, Greensburg.

POSTER PRESENTATION: ORGANISMAL – POSTER #32

Brain morphology and gene expression changes of *Drosophila melanogaster* in the brain and nervous system resulting from misregulation of Jazf-1.

Jazf-1 is an important regulator of genes expression in both *Homo sapiens* and *Drosophila melanogaster*. In *Drosophila*, it has been suggested that Jazf-1 is important in the regulation of the nervous system. However, the precise role it plays in the nervous system is currently unknown. To better understand how Jazf-1 regulates the nervous system, this study uses two different approaches. One of these, focusing on morphology, and the other, gene expression changes. Both approaches use an upstream activation sequence (UAS) to either induce overexpression of Jazf-1 or a RNAi knockdown of Jazf-1. In the first approach, specific nervous system drivers activate the UAS system and GFP. Therefore, targeted neurons are misregulating Jazf-1 while simultaneously being marked by GFP. This allows a comparison of structural differences among the GFP expressing cells. The second approach uses the GAL4-UAS system to misregulate Jazf-1 and quantitative RT-PCR to find expression differences. Preliminary data suggested a change in gene expression in the nervous system, we are exploring a wider variety of gene expression within the nervous system. With this combined approach, we should be able to determine the role of Jazf-1 in the overall nervous system morphology and gene expression.

Noble, Jacy, Ally Fredrick, and Erin Witalison. Tau Eta, Catawba College. *POSTER PRESENTATION: MOLECULAR & MICROBIOLOGY - POSTER # 15* Effect of LIV/ Rediction on MCE 7 Preset Concer College

Effect of UV Radiation on MCF-7 Breast Cancer Cells.

Epithelial cells play a key role in protecting our body from hazardous environmental factors. The most detrimental threat to our cells is the sun because excessive sun exposure can lead to numerous pathologies, as well as sunburn and premature aging. The sun exposes our cells to harmful UV rays, including UVA and UVB rays. Since our skin is our body's first line of defense, epithelial cells are the primary cells affected by sun exposure. This prompted my research to question what is happening on the molecular and genetic level to our cells after exposure to UVA, UVB, and UVC rays. For my project, I am using MCF-7 breast cancer cells cultured under standard, sterile conditions. I will start by exposing the MCF-7 cells to UVC radiation in different time increments (5 seconds up to 1 minute). From this, I will determine the effect of UVC exposure on MCF-7 cell viability using a Resazurin assay to measure the effects of UV-C exposure on MCF-7 cell viability, and a comet assay to quantify the DNA damages induced by exposure to UVC . It is already well-known that UVC exposure is lethal to cells, but we are interested in determining the molecular effects of low exposure that does not induce a significant decrease in viability. These techniques will allow me to observe changes to gene and protein expression and oxidative stress response pathways. We plan to expand our study and use reverse transcription PCR and western blotting techniques, as well as compare the effects of UVA and UVB rays. Our results can ultimately help improve our understanding of DNA damage and oxidative stresses caused by UV radiation.

Noyal, Aiza. Tau Lambda, University of North Carolina, Charlotte. *POSTER PRESENTATION: MOLECULAR & MICROBIOLOGY – POSTER #3* <u>Investigating The Role of Mincle in Staphylococcal Osteomyelitis.</u>

Staphylococcal osteomyelitis is a serious infection of bone tissue that results in progressive inflammatory bone loss. Understanding the molecular mechanisms underlying damage associated with *Staphylococcus aureus* infection is crucial for developing novel points of therapeutic intervention. Macrophage-inducible C-type lectin receptor (Mincle) serves as a receptor for pathogen and damage-associated molecular motifs

and is known to be expressed by sentinel immune cells such as macrophages. Surprisingly, preliminary data from our team has shown that the expression of mRNA encoding Mincle is upregulated in bone-forming osteoblasts, a non-leukocytic cell type, following infection with *S. aureus*. Here, we have utilized immunoblot analysis to demonstrate that Mincle protein is present in primary murine osteoblasts and show that its level of expression is increased following *S. aureus* infection. To determine whether Mincle is functional in osteoblasts, we challenged cells with two specific ligands for this receptor, trehalose-6,6-dibehenate (TDB) and -glucosylceramide (β -GlcCer). We have found that both TDB and β -GlcCer increases the level of phosphorylated spleen tyrosine kinase (Syk), a downstream signaling component for Mincle, in osteoblasts and increases the release of the proinflammatory cytokine interleukin-6 (IL-6) by these cells, as determined by immunoblot analysis and specific capture enzyme-linked immunosorbent assays (ELISAs), respectively. Such responses were found to occur in both a time and dose-dependent manner. Together, these data support the notion that Mincle is functionally expressed by osteoblasts to S. aureus confirmed the relative impact of Mincle as beneficial on the responses of osteoblasts to S. aureus challenge.

Oehler, Patrick. Sigma Theta, Texas Wesleyan University. POSTER PRESENTATION: MOLECULAR & MICROBIOLOGY – POSTER #16 Characterization of a Coumarin-Substituted 1,2,4-Oxadiazole as a Novel Antifungal Agent.

The lethal potential of fungal infections has been compounded by a recent rise in antifungal resistance. As synthesizing novel antifungals is the only way to truly combat the issue, we developed a novel coumarinsubstituted 1,2,4-oxadiazole believed to possess such properties. Notably, this oxadiazole was watersoluble, which should facilitate future development of related medicinal compounds, and fluorescent, which should enable the tracking of localization. The antifungal activities of a range of oxadiazole concentrations were characterized against *C. albicans* by spectrophotometrically measuring cell concentrations to generate growth curves over 48 hours. Comparison of the growth curve parameters from models fit to the data showed a linear, negative correlation between oxadiazole dose and V_{max}. To distinguish between fungicidal and fungistatic behavior, the concentrations of colony-forming units (CFUs) were measured following the 48-hour incubation period. A three-fold decrease in CFU concentrations was observed in the 25 mM treatments. Additionally, these treatments produced increased fluorescence in the oxadiazole's emission range, suggesting that the cells retained the compound, and a substantial darkening of cell pellets.

Powers, Darren. Delta Sigma, Southwestern Oklahoma State University. POSTER PRESENTATION: MOLECULAR & MICROBIOLOGY – POSTER #5 AMPK-Mediated Survival Strategies: A Study of Autophagy in Nutrient-Deprived Ca

AMPK-Mediated Survival Strategies: A Study of Autophagy in Nutrient-Deprived Cancer Cells.

Cancer is the second-leading cause of mortality, with about 10 million deaths annually worldwide. Cancer is characterized by uncontrolled growth of mutated cells in the body. The rapid proliferation of cancer cells results in microenvironmental stresses, including low nutrient and oxygen levels. Cancer cells are characterized by increased glucose uptake. However, cancer cells can exhibit remarkable tolerance for nutrient deprivation, including glucose suppression. Cancer cells strive to acquire additional nutrients by hook or crook to survive metabolic stress and use multiple mechanisms to combat cell death. Nutrient sensing by the signaling molecules plays an important role in maintaining and regulating metabolic processes. Moreover, to compensate for the nutritional and metabolic deficiencies, cells can undergo autophagy when they "eat" and "digest" their cytoplasmic components to provide building blocks for the metabolic processes. This project aims to understand the relationship between autophagy and metabolic signaling under nutrient-stress conditions in cancers. Using the nutrient starvation approach, immunoblotting, and cell viability assays, we are currently studying the intricacies of nutrient sensing

cascade and autophagy in response to nutrient stress. Our preliminary data indicates that cancer cells appear to upregulate autophagic functions under glucose- and glutamine-deprived conditions via the AMPK signaling cascade.

Pugh, Tiffany, Hannah Kersemeier, Jaci Maze, Mia Brantley, and Dr. Jon Milhon. Epsilon Gamma, Azusa Pacific University.

ORAL PRESENTATION: MOLECULAR & MICROBIOLOGY 1:45-2:00PM Investigating the Role of the Zinc Finger Motif in SmMAK16 Protein in rRNA Binding.

Schistosoma mansoni is a parasitic fluke that causes schistosomiasis, a neglected tropical disease. The propagation of schistosomiasis depends upon egg production and resistance to anti-parasitic drugs corresponds to a polymorphism in the *S. mansoni* rRNA sequence. As a result, ribosomal biogenesis is of particular interest as a potential therapeutic target. *Sm*MAK16 is a nucleolar protein encoded by *S. mansoni* that participates in ribosomal biogenesis by associating with precursor rRNA. Previous work in this lab determined that *Sm*MAK16 encodes a zinc finger motif. Since zinc fingers are often involved in binding nucleic acid, we sought to investigate *Sm*MAK16's ability to bind rRNA. WT GST-*Sm*MAK16 fusion protein and a quad mutant (QM) *version* with the four cysteine residues involved in the zinc finger changed to serine were created. FPLC-purified fusion protein and *S. mansoni* lysates will be combined with glutathione agarose beads to perform a coprecipitation. rRNA bound to the protein will be analyzed using RT-PCR. If *Sm*MAK16 uses its zinc finger to bind rRNA an appropriate PCR product would be found in the RT-PCR from the WT *Sm*MAK16 but not the QM. Initial pull-down assays with GSH agarose beads and fusion protein show success in the initial steps of this process.

Reitz, Taylor, Ebony Saccento, Mike Kardos, Sarah Woodley. Xi Psi, Duquesne University. ORAL PRESENTATION: ECOLOGY, ENVIRONMENT, & ORGANISMAL 1:45-2:00PM Characterizing Patterns of Skin Biofluorescence in the Desmognathus Family.

Biofluorescence occurs when organisms absorb light at one wavelength and emit it at another. Biofluorescence is widespread in animals and has recently been discovered in salamanders. In Red-back salamanders, males exhibit a higher density of biofluorescent speckling on their ventral tail than females, suggesting a function in social interactions related to reproduction. To determine if male-biased sex differences in biofluorescence are widespread among salamanders, we characterized biofluorescent patterns in males and females of three species of salamanders in the Desmognathus genus. Salamanders were anesthetized and biofluorescence was observed under a fluorescent microscope that was exciting the salamander skin at a wavelength of 480 nm and emitting light at 535 nm. The density of biofluorescent glands was measured using Image J. Contrary to expectation, females in all 3 species had a significantly greater density of biofluorescent glands compared to males throughout the body, including the ventral and dorsal tail, and the ventral head. Overall, we conclude, there is an established pattern of greater biofluorescence in females than in males in the Desmognathus genus. Future research will seek to determine the function of the biofluorescent glands to better understand why females have more biofluorescent glands than males.

Ruiz, Daniel. Tina Emmanuel, Dylan Cienfuegos, Carmony Hartwig. Tau Eta, Catawba College. ORAL PRESENTATION: ECOLOGY, ENVIONRMENT, & ORGANISMAL 2:00-2:15PM Real-life Zombies: Cordyceps in our Backyard?

'Zombies' and Apocalyptic-level Horror. Terms often associated with Cordyceps, a genus of parasitic fungus that has been documented to infect a wide range of insects and arthropod hosts, in a story that pushes the boundaries of fiction, yet remains terrifyingly real. The success of this parasitic fungus is attributed to manipulating the host's behavior, often favoring survival and reproduction, with fatal determent to the

host (de Bekker et al., 2014). Such behavior is exhibited through phenotypic attributes, such as a "death grip" that involves fungal chemical manipulation of the host that directs them to climb up vegetation and anchor their mandibles to the underside of a leaf stem, or twig. Once in its final resting place, the fungus continues to flourish from within, eventually sprouting fruiting bodies from the host (Lin et al., 2020). Among this diverse array of documented hosts, *Camponotus spp.*, commonly known as carpenter ants, have been recently found within Catawba College's Ecological Preserve with demonstrated infection by suspected Cordyceps. *Camponotus spp.* have been identified as parasitized within the temperate woods of adjacent South Carolina, recently renamed after the Citizen Scientist that discovered it as *Ophiocordyceps unilateralis kimflemingiae.* In this study, we first aim to identify the fungal species capable of infecting local *Camponotus spp.* hosts on the Catawba College campus using ITS barcoding, and further explore the potential effects of varied microbiomes on the ability of *Cordyceps spp.* to establish infection on specific host species vs. non-host species using 16S Metagenomic analysis.

Sanchez, Ryan. Epsilon Gamma, Azusa Pacific University. POSTER PRESENTATION: ORGANISMAL – POSTER #35

Assessment of metabolic flexibility by RER in the Gromphadorhina portentosa.

Metabolism is the series of chemical reactions utilized by organisms to create energy to drive physiological and cellular functions. Understanding the metabolism of ectothermic organisms has been an area of interest that is widely understudied with limited model organisms. Using the *Gromphadorhina portentosa* (Giant Madagascar Hissing Cockroach) as a model organism, ectothermic metabolism was measured by respirometry using a closed animal chamber and iWorx gas analyzer. The metabolic rate was calculated as the Respiratory Exchange Ratio (RER). Experiments were conducted to study allometry, sexual dimorphism and the effects of high temperatures, exercise and differing diets on the metabolic rate of *G. portentosa* compared to control. The data showed significant changes in RER under several of these experimental conditions. To supplement our gas analysis, we utilized biochemical assays to elucidate why several experimental groups exhibit RERs >1.0. Preliminary results show glucose and triglyceride levels in hemolymph accommodate metabolic flexibility requirements in the above experimental conditions. This work represents the most comprehensive evaluation of this ectotherm and adds to our understanding of one of the largest insects.

Schuster, Emma. Gamma Epsilon, Saint Mary's University of Minnesota. ORAL PRESENTATION: BIOMEDICAL SCIENCE 1:30-1:45PM

<u>Assessment of gene expression profiling and functional prioritization of nuclear envelope genes in</u> <u>Alzheimer's disease.</u>

Alzheimer's disease affects millions of people each year. Current literature suggests involvement of the nuclear envelope within multiple neurodegenerative diseases. This study focused on unveiling transcriptomic changes of genes coding for nuclear envelope-associated proteins in Alzheimer's disease brains. A dataset (GSE173955), from NCBI-GEO (Gene Expression Omnibus) website, was utilized for transcriptomic analysis, containing RNA sequencing on hippocampal samples from Alzheimer's and control patients (n=8/group). Threshold significance was set at adjusted p-value of < 0.05. Functional enrichment and gene prioritization was performed using Reactome and the Database for Annotation, Visualization, and Integrated Discovery (DAVID). Additionally, protein-protein interactions were predicted within the STRING database. Gene expression analysis yielded 1,165 significantly upregulated and 1,299 significantly downregulated genes (adj. p < 0.05). Of these, 37 upregulated and 63 downregulated genes were shown to be associated with the nuclear envelope. The most enriched functions were linked to genes coding for nuclear pore complex proteins (nucleoporins). Upregulated nucleoporin genes were *NUP98, NUP160,* and *NUP188,* with fold changes (FC) of 1.22, 1.57, and 1.37, respectively. *RAE1* and *SEH1L* were downregulated

(FC of -1.35 and -1.56, respectively). These results suggest nucleoporins and other nuclear envelope-related proteins play an important role within the molecular mechanisms of Alzheimer's disease.

Soo, Todd. Epsilon Mu, Chapman University.

POSTER PRESENTATION: MOLECULAR & MICROBIOLOGY – POSTER #37

Variance of Biondi Body amyloid morphology in human choroid plexus epithelial cells demonstrates Alzheimer's disease-related differences.

The human choroid plexus produces the cerebrospinal fluid that provides nutrition and protection to the brain. However, the choroid plexus is susceptible to the formation of Biondi Bodies, fibrillar amyloid aggregates whose composition is similar to amyloids found in Alzheimer's disease. While some research has been done on their composition, their specific morphologies have not yet been fully elucidated. To fill this knowledge gap, we analyzed Biondi Body morphologies of 34 human choroid plexus samples stained with Thioflavin-S in 3-dimensional z-stack images. After observing these images, we noticed that individuals differed highly in their presentation of Biondi Body morphologies. So, we formed and quantified eight total categories of Biondi Bodies consisting of exclusive primary and non-exclusive secondary categories that correspond to the shape and characteristics of the Biondi Body. Additionally, these Biondi Bodies show distinct differences in morphological distribution between individuals diagnosed with Alzheimer's disease and those not diagnosed. Individuals diagnosed with Alzheimer's disease tend to possess higher distributions of ring-shaped Biondi Bodies while non-Alzheimer's disease individuals possess higher distributions of small, multiple Biondi Bodies. Individuals who possessed more ring-like Biondi Bodies were also found to contain a higher number of Biondi Bodies overall. The Biondi Bodies are of particular interest because they are composed of amyloid proteins, similar to those found in the hippocampus during Alzheimer's disease pathogenesis. They are also unique from other amyloids, as Biondi Bodies form distinctly from one another in highly ordered shapes from an autofluorescent lipofuscin core. With a significant relationship established between Alzheimer's disease and Biondi Body morphology, it is crucial to understand their function. Our quantification of the distribution of Biondi Bodies suggests that their development is related to the progression of Alzheimer's disease, implying a possible pathologic effect that can be further studied.

Stonbraker, Madison. Theta Pi, University of Pittsburgh, Greensburg. POSTER PRESENTATION: BIOMEDICAL SCIENCE – POSTER# 21

Insight into how Jazf-1 regulates gene expression in the eye nervous system.

Jazf-1 is a human gene that has demonstrated to modify histones that influence the expression of other genes. Since it is highly conserved, we can use Drosophila melanogaster to study Jazf-1 in vivo and better understand its role in specific tissues. While it is unknown how Jazf-1 affects neurons within Drosophila, evidence shows it regulates neurons and eye development in Drosophila. Using a UAS-Gal4 system we can specifically upregulate and downregulate Jazf-1 in the eyes. We can also make this system more sensitive by using a Lobe (L2) allele which influences eye development. We hypothesize that changing Jazf-1 expression in the developing brain and eyes would influence histone modifications and change specific gene expression. While we can make this more sensitive system by using an L2 genetic background, we can also use different drivers that change the function in other parts of the brain. Using a list of 16 potential genes that Jazf-1 levels will change expression of these genes. Furthermore, using the mushroom body specific driver, OK107, we found mushroom bodies form a defect in the medial lobe of the mushroom body when Jazf-1 expression is modified. Our experiments demonstrate that Jazf-1 does regulate the proper formation of the eyes and the mushroom body of the developing brain, further supporting its important role in development of the nervous system.

Swanberg, Joel. Iota Delta Chi, Crown College. POSTER PRESENTATION: ECOLOCY & ENVIRONMENT – POSTER #29 Good Gall-y! Field prevalence of gall-forming insects in Carver County, Minnesota.

Goldenrod (*Solidago* spp.) is a common perennial plant which hosts gall-forming insects, making it an ideal system for studying plant-gall interactions. Gall-formers include *Eurosta solidaginis* (*Eurosta*-galls), *Asteromyia carbonifera* (Blister-galls), and *Rhopalomyia solidaginis* (Rosette-galls). This project aimed to determine if infection or coinfection varies within a small geographic area and focused on interactions between Goldenrod symbionts and plant characteristics. Five sampling sites in Carver County, Minnesota included Crown College (CC), Lake Auburn (LA), Grimm Farm (GF), Steiger Lake (SL), and Monarch Singletrack (ST). No differences in *Eurosta*-gall prevalence were found. However, Rosette-gall prevalence was variable. CC had fewer Rosette-galls than GF and ST. Additionally, SL and LA had a significantly lower prevalence of Rosette-galls than ST. Blisters behaved oppositely than Rosette-galls, with CC, GF, and LA having significantly (or nearly significantly) higher prevalence of Blister-galls. Results may suggest an antagonistic interaction between Rosette-galls and Blister-galls. Findings contribute to the understanding of Goldenrod-gall interactions between gall-formers is warranted as model systems for studying pathogen-pathogen relationships are in high demand.

Taylor, Mackenzie, Riley Lesko, Taylor Podob, and Dr. Olivia Long. Theta Pi, University of Pittsburgh, Greensburg.

ORAL PRESENTATION: MOLECULAR & MICROBIOLOGY 1:15-1:30PM

Effects of Lithium Chloride in C. elegans: A Potential Therapeutic Treatment for Huntington's Disease.

Huntington's Disease (HD) is a rare genetic disease that causes the progressive breakdown of nerve cells in the brain. HD causes the DNA sequence "CAG," which consists of cytosine, adenine, and guanine, to continuously repeat more than usual, typically having 36 or more repeats. The model organism Caenorhabditis elegans (C. elegans) has been used to observe and attempt to treat Huntington's Disease. C. elegans are small, comparable to the tip of a pencil, and they can be easily and maintained in a laboratory environment in plates of NGM that are seeded with E. coli bacteria. The C. elegans' genome has been mapped since the late 90s and has homologs with the human genome, allowing for research done with them to be applied to human models. In the experiment, Lithium Chloride was picked to treat the longevity and motility of the animals because it reduces dopamine levels in presynaptic cells and results in inhibitory effects on the postsynaptic cell, shutting down the synapse. This mechanism could lower the high levels of dopamine and chorea seen in HD patients. Also, paraquat was picked for research because it functions in cellular metabolism, affecting any organism's development, lifespan, and reproduction. In wild-type worms, a small amount over a short amount of time has shown a decrease in mitochondrial membrane potential, the breakdown of linear to fragmented mitochondria, and a decline in longevity. The C. elegans strains EAK102 and EAK103 were used in the research as HD model organisms, the EAK103's having a motility effect, causing more CAG repeats. 3 assays were completed: longevity, thrashing, and imaging. Overall, lithium chloride and paraquat showed no significant impact on lifespan of the worms in the longevity assay, but they showed significant impact on their motility in the thrashing assay and their appearance in the imaging assay.

Uhlig, Rachel Helen. Delta Sigma, Southwestern Oklahoma State University. *POSTER PRESENTATION: ECOLOGY & ENVIRONMENT – POSTER #30* Sexual selection in response to varying levels of cultural eutrophication.

Sexually selected traits are expensive to build and maintain. This makes them condition-dependent and useful for making decisions about potential mates. However, the condition-dependence of these traits is also expected to make them hypersensitive to environmental change. We explored patterns of sexual selection in populations of amphipods in the genus *Hyalella* exposed to varying levels of nutrient pollution. These varying levels are likely due to fertilizer runoff from local farms. Higher levels of phosphorous, indicative of high nutrients, were predicted to lead to larger sexually selected traits, the posterior gnathopod (a claw-like trait) and second antenna.We collected amphipods from the lakes and compared male sexual trait sizes. We discovered that males collected from lakes with more nutrients tended to have larger sexual traits. Female choice may be compromised because poor quality males can build larger sexual traits. This could worsen the overall health of the population.

Walker, Chris, Lauryn Benedict. Phi Omicron, University of Northern Colorado. POSTER PRESENTATION: ECOLOGY & ENVIRONMENT – POSTER # 25

Changing colors: Using different color-measuring tools for avian coloration analysis.

Vibrantly colored birds of many hues can be found at every turn. Plumage colorations can be impacted by variables such as sexual selection, social signaling, and diet. An example of a diet-based pigment found in feathers are carotenoids, which provide warm hues including reds and oranges. Eating a carotenoid-rich diet can provide brighter colorations to birds with better access to resources or different resource types. These bright carotenoid-colored feathers can provide an evolutionary advantage for these birds; sexual competitions or dominance hierarchies outcomes can be determined through these colorations. Redwinged blackbirds (Agelaius phoeniceus) are known for their red-orange epaulets. These are specifically used to signal dominance, health, and desirability by potential mates. Much research has been done on males, but females have historically been left out of analyses on coloration. In this study, I used photography and spectrometry techniques to compare male and female red-winged blackbird epaulet coloration. These two techniques have different advantages and disadvantages, including monetary cost, amount of data collection (pinpoint data versus whole area data), application access, and more. The goal of this research is to analyze the differences in the results from each testing type; this will have implications for how these tools should be used in a field study. If they yield similar results, the preferential tool can be utilized in future studies. If they yield different results, we will analyze what may be causing these differences so that we can trust our tools to be reliable in future studies of wild birds.

Waltermire, Hunter, Dr. Olivia Long. Theta Pi, University of Pittsburgh, Greensburg. *POSTER PRESENTATION: MOLECULAR & MICROBIOLOGY – POSTER #14*

Effects of apoptosis pathways in *C. elegans* on development, lifespan, and removal of apoptotic cell corpses.

Apoptosis occurs in a specific manner during development. The resulting cell corpses are then recognized and removed by a nearby phagocytic cell, which is regulated by three major known pathways in *Caenorhabditis elegans*. Mutations that inhibit the function of certain proteins in these pathways stop this from occurring efficiently. This study investigated the effects of mutations and knockdowns in these pathways on the development, lifespan, and removal of cell corpses in a *C. elegans* model. The removal of the function proteins in these pathways in null mutation models showed poorer development and survival than the wildtype strain. Two proteins downstream in one of the pathways were also knocked down using RNA interference to study their effects on the crosstalk regulation of a separate pathway by cell corpse

clearance phenotype, and on organism development and lifespan. The results from this study further the ongoing research into these cell corpse clearance pathways and their overall effects on the organisms.

Weldon, Katelyn. Rho Theta, Thomas More University. POSTER PRESENTATION: MOLECULAR & MICROBIOLOGY – POSTER #4

Innovative and economical methods for analyzing colorimetric assay data.

Colorimetric assays (CAs) provide quantifiable data based on the concentration of solutions of a particular color. Spectrophotometry is a common method used for CAs by measuring the absorbance of light of a solution with a spectrophotometer – yet the use of spectrophotometers can be cost prohibited. The purpose of this study was to compare more economical methods of analyzing colorimetric data, including ImageJ (IJ) and Microsoft PowerPoint (PP) by using grey-scale values rather than absorbency. Results indicated that the three methods were statistically similar when performing the Griess Assay – a common colorimetric assay used to detect nitric oxide derivatives. When comparing the calculated concentrations for spectrophotometry (Spec) to IJ and PP the R² values demonstrated high correlation: Spec/IJ=0.937, Spec/PP=0.905, and IJ/PP=0.9939. These data suggest IJ and PP may be viable options to substitute for spectrophotometry allowing for reduced costs under certain conditions.

William, E. Frank, Ken D. Brandon, Kimberly M. Stroka. Zeta Kappa, University of Puerto Rico at Ponce. *ORAL PRESENTATION: BIOMEDICAL SCIENCE 1:00 – 1:15PM*

CRP and VEGF Effects on Endothelial Barrier Integrity: Implications for Atherosclerosis.

Atherosclerosis is the leading cause of heart disease-related deaths. Upregulated growth factors in atherosclerosis, like vascular endothelial growth factor (VEGF), induce angiogenesis and permeability. C-reactive protein (CRP) is a biomarker predictive of cardiovascular events. Our research aims to investigate the influence of CRP on the vascular barrier and its impact on VEGF-induced permeability. We hypothesize that CRP stimulation will alter EC Junctions (ECJ) phenotype and affect VEGF-induced permeability. To test this hypothesis, we seeded human umbilical vein endothelial cells onto glass-coated biotinylated fibronectin substrates. Confluent monolayers were treated with VEGF and CRP. Following treatment, FITC labeled avidin was added directly to the cell apical surface, allowing it to diffuse through permeable openings in the monolayer and irreversibly bind to the biotinylated fibronectin substrate for subcellular quantification and visualization of the permeable EC monolayer. VE-cadherin was fluorescently labeled to identify ECJs. We quantified ECJ phenotype and cell morphology characteristics using our lab's novel junction analyzer program (JAnaP). This project demonstrates early findings of the effects of CRP on ECs, and CRP's role in preserving junction integrity, and possibly in reducing VEGF-induced permeability. This study clarifies the impacts of CRP and VEGF on ECs in the context of atherosclerosis.

Wilson, Kristina, Magdalena Magaj, Dr. Stefanie Redemann. Upsilon Rho, St. John Fisher University. ORAL PRESENTATION: BIOMEDICAL SCIENCE 1:15-1:30PM

The role of cls-2 during chromosome segregation in C. elegans.

During mitosis, the mitotic spindle functions to faithfully separate chromosomes which is critical for the survival of the organism. Any error in this process could lead to cancer or developmental abnormalities. Recent publications have established that the microtubules between the segregating chromosomes, the spindle midzone, is critical for chromosome segregation. Prior research has suggested that sliding forces in the midzone may be generated by microtubule polymerization. Although, we lack significant information about how the spindle midzone generates forces supporting chromosome segregation during anaphase. One proposed model for midzone organization and function suggests that microtubule polymerization in the midzone may be regulated by CLASP in order to produce the force needed to segregate chromosomes. Previous research strongly suggest that CLASP is important for formation of

microtubules in the midzone. However, it is unclear whether this is due to support of microtubule growth or nucleation by CLASP. We will study the role of CLASP by depleting the C. elegans homolog cls-2 by RNAi during the first cell division in the C. elegans embryo. We quantified overall changes in spindle assembly and chromosome segregation as well as changes in microtubule dynamics, such as growth-rates and turn-over. In addition, we will determine the effect of cls-2 (RNAi) on the localization of other midzone proteins. The results of this study will lead to a better understanding into the mechanisms that are governed by cls-2.

Wingard Byers, Molly Ann. Delta Sigma, Southwestern Oklahoma State University. ORAL PRESENTATION: ECOLOGY, ENVIRONMENT, & ORGANISMAL 1:30-1:45PM

Unseen Opportunity: Do Hermaphrodite Cues Influence Male-Male Aggression in Mangrove Rivulus Fish.

Aggressive contests in fish often occur in the presence of an audience, which can affect contest dynamics and outcomes. These so-called "Audience Effects" can vary depending on the sex of the audience members. For example, a female audience can elicit increased use of low-intensity displays and decreased use of high-intensity attacks between the male combatants. Mangrove rivulus (*Kryptolebias marmoratus*) fish occur naturally as either self-fertilizing, simultaneous hermaphrodites or functional males. Male rivulus' reproductive success thus depends on their ability to obtain outcrossing opportunities with hermaphrodites. Our study's aim is to examine if hermaphroditic chemical cues in the absence of visual cues influence the intensity of male-male rivulus contests and if unequal access to these cues provides a competitive advantage. We dosed focal individuals with either DI water (control) or water laced with hermaphroditic cues (treated). Following, we created size-matched pairings that resulted in three combinations of contestants; control-control, control-treated, and treated-treated. We found that untreated, control-control contests were more likely to escalate to high-intensity behaviors compared to treated-treated contests. Further, dosed individuals pitted against untreated individuals did not have a competitive advantage. Our findings show that male rivulus do modulate their aggressive behavior dependent on presence of an audience

Wise, Julia. Mu Omicron, Columbus State University. ORAL PRESENTATION: BIOMEDICAL SCIENCE 1:45-2:00PM Exploring General Dentistry.

Raising awareness about the importance of oral health and how cavities form on our teeth. Understanding the chemistry of the oral cavity and how certain foods affect the health of our teeth. Highlighting the significance of the procedures performed, such as root canals, composite fillings, and tooth extraction. Ensuring that the public understands why certain procedures are necessary and how they are carried out. Educating the public regarding oral health and the different treatments can reduce the appearance of cavities and reduce dental anxiety.

Yupe, Nahara, Yarelis Velez. Zeta Lambda, University of Puerto Rico Aguadilla. *POSTER PRESENTATION: ECOLOGY & ENVIRONMENT – POSTER #27* Selection of a specific aptamer for the detection of the pesticide Oxamyl.

Pesticides are chemical substances utilized in agriculture to safeguard plantations as pest control. This study analyzes Oxamyl, a water-soluble carbamate used in Puerto Rico to protect plantain crops from nematodes. Oxamyl exposure can pose severe risks to numerous organisms due to its non-specific nature and toxicity. Serious health repercussions are linked to Oxamyl and carbamates in general, as they are endocrine-disrupting chemicals (EDCs) that possess traits potentially leading to infertility. Therefore, monitoring the presence of this pesticide is a vital concern. The use of aptamers is a novel method for molecular and analytical detection of compounds like pesticides because of their high affinity and

specificity. Aptamers of substrates structurally similar to Oxamyl were analyzed using the AutoDock[®] program to obtain an ideal sequence with the highest affinity and selectivity toward the analyte. Subsequent steps consist of evaluating the aptamer binding affinity through Molecular Dynamics in Charmm-Gui[®] to obtain a precise prediction of the aptamer's affinity considering conformational liberty and experimental conditions close to a real environment. The selection of a specific aptamer for Oxamyl will allow the eventual development of an aptamer-based biosensor that will allow us to monitor and control this pesticide in the environment.

NATIONAL PARTNER, NMDP

TriBeta is proud to be national partners with NMDPSM, and excited they are joining our National Convention as an Exhibitor. Their regional representative will share about the mission of NMDP and how your chapter can get involved during the Wednesday night Opening Meeting. NMDP will also have an exhibitor table in the Corn Center on Thursday morning during Poster Presentations so that members and faculty advisors can ask questions and attendees can join the registry.

NMDP is a global nonprofit leader in cell therapy. NMDP creates essential connections between researchers and supporters to inspire action and accelerate innovation to find life-saving cures. For people with life-threatening blood cancers—like leukemia and lymphoma—or blood disorders like sickle cell, a cure exists. Since 1987, NMDP has facilitated more than 125,000 blood stem cell transplants.

Getting Your Chapter Involved

Through the NMDP Chapters program, TriBeta holds campus registry drives and provides free swab kits for students to join the NMDP RegistrySM. Our TriBeta members and friends will help to grow and diversify the registry so that every patient can receive their life-saving cell therapy. With TriBeta's mission of extending boundaries of human knowledge through scientific research and NMDP's mission of saving lives through cell therapy, together we will save lives.

Interested in hosting a campus or community registry drive through your chapter? NMDP provides great support in planning and executing these onsite events. Your chapter can be a part of helping save someone's life.

Faculty Members

Would you like a NMDP representative to provide a 30-45 minute presentation to your biology or other science classes? Let's connect! We have staff located across the country, volunteers, community teams in select areas, NMDP chapters (officially recognized student organizations) located on 30 campuses that also have a TriBeta chapter and 8 interns at HBCU's where TriBeta is present.

For more about the national partnership between TriBeta and NMDP, visit <u>www.tribeta.org/partnerships</u>.







We save lives. And so can you.

Help us add more blood stem cell donors to the NMDP Registry[™].

Patients with blood cancers and other blood diseases need someone like you to help them find their matching donors. Join us in growing the registry so that every patient has access to a cure.

Get involved



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EXHIBITORS

Thank you to our Exhibitors this year who either provided materials for our attendees or attended the convention in person. We appreciate your support and hope you have a positive experience at our convention while engaging with our student members and faculty attendees.

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ACKNOWLEDGEMENTS

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- Elizabeth Klar, Professor in CSU Biology Department
- Several student member volunteers, including the following: Lisa Palmer, Celina Acevedo, LaNeche Ghee, Shelley Le, Julia Wise, Fiza Khan, and Kevin Nguyen.

Thank you to our keynote speaker, Dr. Katey Hughes of Mercer University, School of Medicine, Columbus, for your words of experience, wisdom, and encouragement.

As always, TriBeta is grateful for our national partner, NMDP, for its continued support and to and our national contact, Matt Kroeger, and regional representative, Sarah Holden, thank you for working hard for our partnership.

We recognize our in-person and other Exhibitors for supporting the national convention this year with your attendance and donation to our attendee goodie bags and silent auction. Specifically, we would like to thank the following individuals.

- Dr. Christopher Horton, University of Oklahoma Health Sciences Center
- Sarah White, Saba School of Medicine
- Matt Kroeger and Sarah Holden, NMDP
- Chris Zhang and Leah Pennell, Georgia Tech
- LuAnn Craighton, The Nature Conservancy
- Sandy Abbott, Ashlie Peterson, and Vicki Baglin, U.S. Fish and Wildlife Service
- Ashley Nicole Desensi, Chattahoochee Riverkeeper
- Amy Gamble-Cocker, Columbus Water Works

We appreciate our field trip hosts Oxbow Meadows Environmental Learning Center, Coca Cola Space Science Center and Whitewater Express for providing us with educational and fun experiences for our attendees.

The Vinyl Room of Florence, AL for their fast turnaround on convention t-shirt printing!

Photographers: Eliza Daffin of Eliza Daffin Photography and Braxton Lee of Brax Lee Studio.

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