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**Biological Honor Society
South Central Regional Convention
2017**

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Beta Beta Beta

National and Regional Officers

National Officers

National President: **Dr. Steve Ropski**
Gannon University, Erie, Pennsylvania

South Central Vice President: **Dr. Adam Ryburn**
Oklahoma City University

National Secretary Treasurer: **Kathy Roush**
University of North Alabama

South Central District 1 Director: **Dr. Charles Biles**
East Central University, Ada, OK

South Central District 2 Director: **Dr. Ali Azghani**
University of Texas at Tyler

South Central Student Officers

Regional President: **Ashley Powers**
Southwestern Oklahoma State University

Regional Secretary: **Annie Kwok**
Baylor University

Regional Parliamentarian: **Melissa Penton**
East Central University



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National Biological Honor Society South Central Region



Greetings to the student delegates and faculty at tending the 2017 South Central Regional Convention. Springtime in north central Texas is an exciting time both biologically and intellectually for TriBeta members. It is a time to renew old friendships and a time to forge new relationships. It is a time to gather for conducting the business of the region and most importantly, for the members to present formally the research conducted during the previous year.

I am especially eager for this year's convention because it marks my first as the South Central Regional Vice President of Beta Beta Beta. As you may know, Dr. Crosby Jones (Angelo State) has successfully served our region as Vice President for over 20 years and has recently retired from this position. I want to personally thank Dr. Jones for his dedication to service and leadership at the regional and national level. Our region has long been the envy at the national level of TriBeta and it is because of the efforts of leaders like Dr. Jones and his predecessor, the late Dr. Gary Wolgamott.

Much effort goes into a successful convention, beginning with the host chapter. I would like to thank the Epsilon Sigma Chapter at Angelo State University, for their leadership in the planning and organizing this convention. As always, Dr. Jones and his students have put a considerable amount of time and energy into setting up the program and scheduling events that make a convention operate smoothly. It is through the efforts of these members of the host and co-host chapters that the convention will be a success.

As always, we have a great line up of oral and poster presentations, representing all areas of the biological sciences. I thank all the students that are presenting their research this weekend and encourage you to consider presenting your research at the National Biennial Convention scheduled for May/June of 2018 in Monterey, CA. This weekend's winners of the Brooks and Johnson Awards, qualify for up to \$750 to support travel to this national convention.

I would also like to encourage our student researchers to take advantage of the funding and publishing opportunities for TriBeta members. This past year TriBeta awarded over \$63,000 in student research funding through the TriBeta Research Grant Program. Be on the lookout for an announcement for grant applications starting in August. I would especially like to invite students to submit their work to *BIOS* for publication. Details on grants and publication opportunities can be found by going to the TriBeta web page (www.tri-beta.org).

Finally, I'm sure we are all going to have an excellent time at Mt. Lebanon. Please don't hesitate to contact me this weekend if I can help make your TriBeta experience better. My email address is below. Take care and have a great convention.

Dr. Adam K. Ryburn
South Central Regional Vice President
Co-Advisor of Alpha Chapter
Oklahoma City University
aryburn@okcu.edu

2017 Convention Organizing Chapters



Host: Angelo State University (Epsilon Sigma)

The Epsilon Sigma chapter was established at Angelo State University in 1970. We are located in San Angelo, Texas and our university is part of the Texas Tech University System. Our university enrollment is currently around 9000. Our chapter holds the distinction of being the only chapter in the nation with eight Bertholf Awards symbolic of the top Tri-Beta chapter in the nation. We have also sent members to the national meeting of Tri-Beta for over thirty years consecutively and we have repeatedly won national awards for our scrapbook and our research papers. We have served our region numerous times as the host chapter for the South Central Regional Convention. Participating at both the regional and national levels is one of the keys to developing a chapter of distinction.

We are excited to have everyone here this year and we hope that you will enjoy the intellectual atmosphere and the social camaraderie of fellow biologists. Do not hesitate to stop one of our members if you have any questions! Good luck to all presenters!!



Co-host: Texas Wesleyan University (Sigma Theta)

In the 1980's, the Sigma Theta Chapter was established by Dr. Mary Ann Clark at Texas Wesleyan University in Fort Worth, Texas. Sigma Theta Chapter prides itself by focusing on the collaboration and the exchange of information with other organizations. Our main trajectory year round is to request and gather information from various speakers. The knowledge presented to Sigma Theta Chapter members is a beneficial step in carrying forward to potential career opportunities. Our members demonstrate teamwork and dedication by collaborating with other organizations within the Texas Wesleyan campus. By volunteering at local charities and fundraisers, our members serve our communities and help raise awareness of various issues.

Participating Chapters

District one

Arkansas, Louisiana and Oklahoma

Alpha	Oklahoma City University	Oklahoma City, OK
Delta Sigma	Southwestern Oklahoma State University	Weatherford, OK
Mu Kappa	Oral Roberts University	Tulsa, OK
Nu Eta	University of the Ozarks	Clarksville, AR
Pi Alpha	The University of Tulsa	Tulsa, OK
Psi Delta	East Central University	Ada, OK
Psi Mu	University of Central Oklahoma	Edmond, OK

District two

Texas

Beta Tau	Baylor University	Waco, TX
Delta Rho	Austin College	Sherman, TX
Delta Tau	Sam Houston State University	Huntsville, TX
Epsilon Sigma	Angelo State University	San Angelo, TX
Iota Omicron	Houston Baptist University	Houston, TX
Kappa Xi	University of Texas at Tyler	Tyler, TX
Nu Delta Beta	Schreiner University	Kerrville, TX
Omicron Kappa	Dallas Baptist University	Dallas, TX
Sigma Theta	Texas Wesleyan University	Fort Worth, TX

Schedule of Events:

Friday, March 31

3:00 – 10:00 PM Registration @ Grande Lodge

4:00 - 6:00 PM Ice cream social on the patio at Grande Lodge

6:30 – 7:30 PM Dinner @ Dining Hall

8:00 – 11:00 PM Chapter Introductions/judges selection@Patton Chapel

Until Midnight: Load Oral Presentations @ Patton Chapel

Until Midnight: Leave scrapbooks for judging @ Patton Chapel

Until Midnight: Poster Set up @ Patton Chapel

Saturday, April 1

8:00 - 9:00 AM Breakfast @ Dining Hall

8:00 – 1:00 PM Poster Set up @ Patton Chapel

9:30 – 11:30 AM Oral Presentations @ Grande Lodge

10:00 -11:30 AM Posters (Blue & Gold morning sessions)@ Patton Chapel

12:00 –1:00 PM Lunch @ Dining Hall

1:15 - 3:15 PM Oral Presentations @ Grande Lodge

1:30 - 3:00 PM Posters (Blue & Gold afternoon sessions)@ Patton Chapel

3:30 – 4:30 PM Regional Business Meeting @ Patton Chapel

4:30 – 6:30 PM Free Time/Entertainment TBA

6:30 – 7:30 PM Banquet Dinner @ Dining Hall

8:00 – 9:30 PM Awards & Guest Speaker @ Patton Chapel

9:30-Midnight: Entertainment @ Patton Chapel

Sunday, April 2

8:00 – 9:00 AM Breakfast @ Dining Hall

7:30 – 10:30 AM Departures @ Grande Lodge

FAQs (Frequently Asked Questions)

1. Where do we take our scrapbooks? We will have tables for scrapbook judging in the Patton Chapel. Have your scrapbook there by midnight on Friday. Please remove it by Saturday night.

2. Is alcohol permitted on site? *Absolutely not!* It is a privilege for us to have these facilities available for our conference and it is our obligation to adhere to the rules and regulations of Mount Lebanon. Violators will be reported to their respective university administrators.

3. Is the awards ceremony "dressy"? We prefer that it be so, but you are not required to do so.

4. Are refunds available? No. It is the obligation of your chapter to deal with inevitable cancellations or changes of plans of its members.

5. How do we check out? You must report to the Grande to do so. We will check your facilities to ensure that you have thoroughly cleaned the premises, taken all trash out and removed any personal belongings that can be identified as originating from your chapter.

6. How do we get the materials for displaying our posters? On Friday evening and all morning Saturday, you will find display easels and other mounting materials in the Patton Chapel. Your poster is assigned a unique and specific number and will be blue or gold tagged. (See program schedule for your number, your color and your time of presentation)

7. What are the rules for oral presentations? You will get no more than 15 minutes including questions to make your presentation. Session moderators have been instructed to cut off presentations at the 15 minute mark. You must also have previously downloaded your presentation onto the Angelo State computer Friday night before midnight at the Patton Chapel.

8. What is the chapter introduction program scheduled for Friday night? It is your chance to introduce your chapter to everyone. Please do not exceed 7 minutes in your presentation. We will have a computer available for you to show a power point presentation if you like.

Convention Menu

Friday dinner (6:30-7:30 PM): Smoked brisket, Pulled pork, ranch style beans, corn on the cob, fried okra, potato salad, Texas toast and banana pudding

Saturday breakfast (8:00-9:00 AM): Scrambled eggs, sausage patties, bacon, biscuits and gravy, hash browns, fresh fruit, assorted cereals, milk and juices

Saturday lunch (12:00-1:00 PM): Grilled chicken breast, chicken fried steak, mashed potatoes and gravy, green beans, buttered carrots, yeast roll and peach cobbler with ice cream

Saturday dinner (6:30-7:30 PM): Beef and chicken fajitas, refried beans, spanish rice, and sopapillas

Sunday breakfast (8:00-9:00 AM): Scrambled eggs, sausage links, bacon, pancakes, fresh fruit, assorted cereals, and milk and juices

Lodging Assignments

Grande Lodge: Angelo State University (33 students and faculty advisor, Dr. Jones)
(12 rooms)

Retreat Center: (7 rooms)

Dr. Lisa Ellis	Houston Baptist University
Dr. Laurie Kauffman	Oklahoma City University
Dr. Adam Ryburn & Dr. Tony Stancampiano	Oklahoma City University
Dr. Andrea Holgado	SWOSU
Dr. Christopher Horton	SWOSU
Dr. Regina McGrane	SWOSU
Jason Strickland	Central Florida University

Evergreen (all females)

Left wing - 3 Baylor, 2 DBU, 7 HBU, 6 UCO (12 vacant beds)

Right wing - 4 OCU, 5 SHSU, 10 SWOSU (11 vacant beds)

Motel C (left side) - Dr. Seagraves and Dr. Luna, UCO

Motel D (right side) - Karen McMahon, Univ. of Tulsa faculty (one vacant female faculty bed)

Live Oak (males on the left wing; females on the right wing)

Left wing (males) - 1 Austin College, 1 Baylor, 9 HBU, 1 OCU, 4 SHSU, 2 SWOSU, 1 UCO, 2 Ozarks (5 vacant beds)

Right wing (females) - 4 University of Tulsa, 11 Ozarks, 2 Schreiner (9 vacant beds)

Director's Room - Dr. Coleman, Dr. Knight, Dr. Sconiers (Ozarks); Dr. Harper (SHSU)
(0 vacant beds)

Sycamore (one night only guests--check out is 8PM Saturday)

Left wing (males) - 1 ECU, 1 ORU, 1 Texas Wesleyan (lots of vacant beds)

Right wing (females) - 5 ECU, 1 ORU (lots of vacant beds)

Director's Room - Dr. Biles and Dr. Moring, ECU (2 vacant male faculty beds)

Guest Speaker - Jason Strickland

Ph.D Candidate, University of Central Florida

“Using snakes and venom evolution as a model system to make the most of your degree”



Jason is former president of the Epsilon Sigma chapter of Tri-Beta at Angelo State University. He won undergraduate research awards at Tri-Beta regional and national meetings while serving as an officer of the ASU chapter. He graduated with his degree in biology and was recognized as the Presidential Award winner, symbolic of the top graduating senior in his class at Angelo State.

Jason has a master's degree in biology from Angelo State University and is currently finishing up his doctoral work at the University of Central Florida. His dissertation work involves studying venom evolution in rattlesnakes. He has conducted field work in the Chihuahuan, Sonoran, and Mojave Deserts of the U.S. and Mexico.

While at UCF, he has successfully mentored undergraduate research projects that have won first place awards at professional meetings such as that of the Southwestern Association of Naturalists.



ORAL PRESENTATIONS SCHEDULE

Morning Oral Session - Grande Lodge

9:15 - 9:30

Caffeine inhibits migration without significant affect on focal adhesion size in Dupuytren's fibroblasts

Joana C. Pantoja, Alexis Coles, Matthew Bryson, Niyaf Alkadhem Ph. D., and Melville B. Vaughan Ph. D. University of Central Oklahoma.

The formation of knots of connective tissue in the dermis that cause one or more fingers to flex to a bent position is called Dupuytren's contracture. Fibrotic diseases like Dupuytren's contracture are comprised of myofibroblasts that have an effect on wound healing and excessive scarring in patients. In recent studies, fibrotic tissues were lacking in rodents treated with caffeine. This project aimed to determine caffeine's effect on Dupuytren's contracture cells in vitro. Cultures of three different IRB approved Dupuytren's contracture fibroblasts were plated in four different experimental models and cells were treated with 5mM caffeine. Past studies have shown that 5mM caffeine reduces proliferation and alpha-smooth muscle actin using a coverslip assay. Caffeine also failed to inhibit contraction after tension generation. Since fibroblasts remodel and compress collagen using migration-like tractional forces, we predicted that caffeine would inhibit cell migration. Using three different migration assays we determined that 5mM caffeine inhibited migration. Therefore, caffeine likely affects cellular pathways related to migration rather than contraction or tension generation. Focal adhesions are protein structures in the cell that form mechanical links with the extracellular matrix and play a role in contraction mechanisms. Immunostaining for focal adhesions was performed and there was no significant difference in focal adhesions between control and caffeine, related to contraction. This suggests that treating already-existing fibrotic conditions with caffeine will be more challenging than preventing future occurrences.

9:30 - 9:45

Investigating the Potential Role of UNC-33 in Modulating Neuronal Development and Human Health

Tosha Williams and Andrea Holgado

Department of Biological Sciences, Southwestern Oklahoma State University.

Schizophrenia is a multifactorial psychiatric disorder that has negative symptoms characterized with abnormal mental behaviors and functions such as hallucinations and unorganized thinking. Studies by Clair and colleagues found an association between the development of schizophrenia in adult life and prenatal nutritional stress in the 1959-1961 Chinese famine. Additional studies by Lee and collaborators demonstrated that the protein dihydropyrimidinase-like 2 (Dpsyl2) is downregulated in the central nervous system of rats developing under conditions of prenatal stress. Behavioral studies of these rats showed that animals grown from prenatally stressed mothers have significant defects in behaviors such as grooming and swimming. Molecular studies of the Dpsy12 expression in nerve cells showed that the mammalian target of rapamycin (mTOR) seems to be critical for regulating the expression of Dpsyl 2, normal neuronal development, and decreased the risk for developing schizophrenia later in life. Dpsyl2 is part of a protein family homologous to collapsing response mediator protein 2 (CRMP2) in humans and UNC-33 in *C. elegans*. Published studies of UNC-33 reported that null and hypomorph unc-

33 mutants have significant defects in neuronal development. Studies from our laboratory also showed that unc-33 mutants grown under starvation fail to go into the stress tolerant larval stage called dauer, suggesting a defective autophagy pathway. To directly test the status of autophagy in unc-33 mutants and potentially find links between reduced UNC-33 expression, autophagy, and neuronal development, we studied the autophagy marker in *C. elegans* neurons of wild type and unc-33 mutants. LGG-1 is a protein that is normally found in the cytosol but in the process of autophagy, it lipidates onto the membrane of the autophagosome which renders the process distinguishable microscopically.

9:45 - 10:00

Effects of fire severity on community recovery in a mixed grass prairie ecosystem

Laura Jardine. Oklahoma City University

I assessed the recovery and current community status of three mixed grass prairie sites 5 years post burn in the Wichita Mountains Wildlife Refuge, Oklahoma. These sites represent three burn histories: moderate burn, severe burn, and unburned. I sampled 37 habitat variables at 280 points along three transects at each site. I established a small mammal trapping array at each site and sampled for a total of 2400 trapnights, collecting 7 mammal species (*Peromyscus maniculatus*, *P. leucopus*, *P. attwateri*, *Sigmodon hispidus*, *Chaetodipus hispidus*, *Neotoma floridana*, and *Cryptotis parva*). These data were subjected to principal components and canonical correspondence analyses to assess trends in habitat structure and small mammal abundance. *Cryptotis parva* and *P. maniculatus* were found in areas with medium to tall forbs and grasses and ungulate disturbance. *Chaetodipus hispidus* were found in areas where the ground is covered with short forbs, mosses, lichens, and cobble and *S. hispidus* in similar areas but with medium height grasses and high amounts of herbaceous litter. *P. leucopus* occurred in areas with water and short grasses. Canonical correspondence analysis indicated that *P. maniculatus* and *C. parva* strongly associated with moderate and severe burn sites, *P. leucopus* with unburned sites, and *C. hispidus* and *S. hispidus* with only one moderate burn site. I interpreted these results as supporting a relationship between high severity fire and more complete nutrient cycling from accumulated litter, leading initially post fire to dense grass cover followed by increasing forb cover.

10:00 - 10:15 BREAK

10:15 - 10:30

Investigation of the need for an expanded definition of the KIX domain in CBP/p300

Melissa Penton and Alisha D. Howard. East Central University, Ada, Oklahoma.

HTLV is a retrovirus identified to be associated with Adult T-cell Leukemia/Lymphoma. The virally-encoded oncoprotein Tax is central to the disease process by recruiting the cellular transcription factor CREB to the viral promoter followed by dynamic recruitment the near-ubiquitously utilized large paralogous coactivator proteins CBP/p300. This recruitment results in activation of the integrated provirus through strong transcriptional activation. An important region of CBP that interacts with the DNA/Tax/CREB protein is known as the KIX domain and has been well documented to participate in recruitment of the coactivators to endogenous genes as well. The KIX domain itself has been studied as an example of allosteric regulation and an exemplar of intrinsically disordered proteins (IDP). While the most currently used region is the so-called minimal domain from 588aa to 683aa,

research using extended N- and C-terminal amino acids included has given indications that these flanking regions might significantly affect the final domain binding functions. Characterizing the sequence and structure of this subunit has become necessary to determine if the differences in binding properties are incidental, or a significant contributor to the mechanisms of CBP as a whole. This has implications for not only HTLV research, but also other studies exploring the interactions of KIX binding and its effect on transcription regulation through allosteric/IDP interactions.

10:30 - 10:45

Phenformin Inhibits the Fibroproliferative Disease Properties of Dupuytren's Contracture Cells

Rachel McNamar and Melville B. Vaughan. University of Central Oklahoma.

Phenformin could be utilized to help treat Dupuytren's contracture by inhibiting myofibroblast differentiation. Myofibroblasts are characterized by an abundance of alpha smooth muscle actin (α SMA) within cytoplasmic stress fibers. This study examines the inhibitory effects phenformin has on differentiation, proliferation, and migration. Dupuytren's contracture cell lines (DP141a, 146, and 139) were used in each assay. A three-dimensional attached collagen matrix model was utilized to measure migration and other migratory properties. Collagen lattices were either treated with +/- TGF- β (1 ng/mL) and/or +/-phenformin (1mM). Cells grown on coverslips and treated as above were stained for differentiation and proliferation. Proliferation was determined using a click-EdU staining procedure; differentiation was determined by visualizing α SMA using immunocytochemistry. Phenformin decreased proliferation and differentiation compared to control and TGF- β groups. Contraction in phenformin treated lattices decreased and the height increased. Phenformin inhibited migration. Migration was restored by removing the phenformin treatment. The increase in height and decrease in contraction demonstrate that there is a decrease in tension. The results from the migration assay show that phenformin inhibits migration without causing cell death. Overall, phenformin inhibited proliferation and myofibroblast differentiation which could help treat fibroproliferative diseases.

10:45 - 11:00

Modulation of Angiomotin expression through CRISPR Endonuclease and Transcription Activators

Matthew Goelzer, Oral Roberts University, Tulsa, Oklahoma

Breast Cancer is the second most diagnosed cancer in the United States. An estimated number of 40,000 women will die of breast cancer in 2015 (Breast cancer). Twenty percent of all breast cancers are diagnosed as triple negative breast cancers. Triple negative tumors are classified by their lack of Her2/neu, progesterone, and estrogen receptors (Ismail-Khan and Mi, 2010). Concentrations of these receptors tend to correlate with cancer grade due to lack of available targeted therapy (Britta et al., 2005). Angiomotin, (Amot) is an apical polarity adapter protein that has been shown to correlate with breast cancer progression. Amot has been shown to disrupt apical polarity, induce dedifferentiation, and promote aberrant cell growth (Ranahan, et. al, 2011). In this study, CRISPR (Clustered Regularly Interspaced Short Palindromic Repeats), an RNA guided endonuclease protein complex, will be used to downregulate Angiomotin expression. Additionally, a nuclease-dead CRISPR complex will be coupled to a transcription activator to attempt upregulation of Angiomotin. This study's aim is to demonstrate that CRISPR technology can be used to silence Angiomotin expression, which could be used as a triple negative breast tumor treatment. Furthermore, this study also aims to demonstrate the use of CRISPR technology in mediating upregulation of Amot80 expression in normal mammary breast, providing a novel tool to study the role of Angiomotin expression during tumorigenesis.

11:00 - 11:15

Antibiotic Resistant Bacteria in an Urban Freshwater Ecosystem in Central Texas

Annie Kwok and Michael Davis, Baylor University, Waco, TX

Antibiotic resistance is a growing concern for the human population, due to an increasing occurrence of antibiotic resistance genes in aquatic ecosystems and the risk of pathogens acquiring those resistance genes. It is desired to more closely examine the relationship between antibiotic resistant bacteria (ARB) and antibiotic residues in an urban freshwater environment. Thus, the main objective of this study is to investigate the presence of antibiotic resistance in wastewater treatment plant (WWTP) effluent leading into the Brazos River. The study further explores the possible mechanisms of resistance emergence among different antibiotics using classical techniques such as replica plating. Three samples of influent wastewater and treated effluent were collected from the WWTP, and cultured on TSA and EMB media to enumerate resistant bacteria in the community. Luria-Delbruck's Fluctuation Test and the Newcombe Test were performed on antibiotic-susceptible bacteria from samples to investigate whether mutations causing resistance in ARBs are induced or spontaneous. Penicillin had the highest rate of resistance from both influent and effluent samples. Most antibiotics had a higher rate of resistance from influent samples on TSA and EMB media. According to Luria-Delbruck's Fluctuation Test and the Newcombe Test, different antibiotics appear to be associated with different tendencies of resistance emergence – raising questions about the roles of random mutation and induction. This study provides a baseline understanding of the urban freshwater ecosystem status in central Texas and quantitatively examines the degree of resistance emergences.

11:15 - 11:30

Small mammal assemblage composition and habitat usage in a semirural landscape.

Cassandra Velasco and Anthony Stancampiano. Oklahoma City University.

During the summer of 2016, we studied the small mammal fauna at John W. Nichols Scout Ranch in extreme southeast Canadian County, Oklahoma. Six species of small mammals, including *Peromyscus leucopus*, *P. maniculatus*, *Neotoma floridana*, *Sigmodon hispidus*, *Reithrodontomys fulvescens*, and *Didelphimorphia virginiana*, were represented in 52 captures. The habitat preferences for these species were then assessed using species' abundance and 21 habitat variables from 10 randomly selected plots. These data were subjected to canonical correspondence analysis, principal components and niche overlap analysis. *Peromyscus leucopus*, *P. maniculatus*, *N. floridana*, and *D. virginiana* exhibited the highest degree of niche overlap, occurring mostly in habitats with large amounts woody litter and overhead canopy. *Sigmodon hispidus* and *R. fulvescens* were found in open grasslands with high grass and forb cover. In this landscape, woodland habitat exhibits higher mammal species diversity probably due to a greater amount of vertical structure.

Afternoon Oral Session - Grande Lodge

1:15 - 1:30

Platinum coordinated compounds bind DNA and alter cellular viability presenting the potential for use as novel anticancer therapeutics

Dilan S Shah. Austin College, Sherman, TX

An estimated 1.6 million individuals will be diagnosed with cancer in 2016 alone, one third of which will be fatal prognoses. Platinum(II) compounds, such as Cisplatin, are used to suppress tumor growth and function by crosslinking DNA and stalling replication and transcription machinery. While Cisplatin is highly effective against many solid tumors, patients often experience negative systemic side-effects and over time cancer cells can develop Cisplatin-resistance through several mechanisms. Cisplatin's square planar Pt(II) structure is key in its ability to penetrate the cell membrane and bind DNA. Related planar Pt(II) compounds can be synthesized by reacting diimine with platinum(II) and introducing the complex to varying charged dithiolate ligands. By varying the ligands, the compounds may acquire different characteristics. DNA treated with these novel compounds exhibits a shift from the standard melting curve profile of dsDNA, indicating that a number of these Pt(II) compounds are indeed binding DNA similarly to Cisplatin. Additionally, these novel Pt(II) compounds demonstrated differential toxicity when exposed to cultured cells. This differential toxicity may be correlated with differences in binding or transport mechanisms related to the new structures. It is the goal of this project to develop a better understanding of the resistance mechanisms developing against Cisplatin and to gain a greater functional understanding of toxicity as related to structure in planar Pt(II) compounds that cross-link DNA.

1:30 - 1:45

Mitigated Creek Turnpike Wetlands: Success or Succession? A comparison of vegetative surveys from 1992-97, 2011-12, and 2016.

Jared Jarrell, Oral Roberts University, Tulsa, Oklahoma.

The Creek Turnpike Wetlands were created in the early 1990's as a response to the construction of the turnpike that destroyed natural wetlands. Federal law states that there can be no net loss of wetlands in the U.S (Clean Water Act Section 404). A wetlands can be defined as an area of land where water saturation determines the substrate development and the types of plants and animals that live there. The only feature all wetlands share is a substrate that is at least periodically covered or saturated by water (Federal Geographic Data Committee, 2013). A mitigation involves the creation or restoration of a wetland to compensate for the loss of a naturally occurring wetland due to human development. This study will reassess the mitigated Creek turnpike wetlands sites A, and C using the Braun-Blanquet vegetative coverage scale and comparing them to the previous surveys. The relative abundance of facultative wetland (FAC) and obligate wetland (OBL) plant species is an indicator of a functioning wetland (USDA, NRCS.2011). This study will be conducted during the 2016 growing season that follows a year of abundant rainfall that filled the wetland sites. The 2016 data will be compared to the 2011-12 vegetation surveys conducted during the drought years of 2011-12 and to the original surveys conducted after wetland construction. The aim of this study is to see a resilience in the FAC and OBL plant species and coverage abundance in a wet year from the data during the drought years.

1:45 - 2:00

Ants in Your Pants? Comparative Population Genetics of Red Imported Fire Ants (*Solenopsis invicta*) in Edmond, Oklahoma

Audrey M. Matheny, Laura B. Kimmel, Paul A. Stone and Allyson M. Fenwick.
University of Central Oklahoma.

We analyzed genetic variation and population structure of red imported fire ants (*Solenopsis invicta*) at the University of Central Oklahoma (UCO) campus and Lake Arcadia. The invasion of UCO is likely a recent event, while the Lake Arcadia population has been established for many years. Genetic variation at each location is expected to be low if there was a single introduction and higher if there were multiple introductions. Multiple invasions should also result in several genetic clusters. Based on colony establishment, we predicted Lake Arcadia would show evidence of multiple invasions, while UCO would show evidence of one or two invasions. We sampled ants from 25 colonies around the lake, and eight colonies across UCO. We optimized and genotyped 11 published microsatellite loci. Genetic differentiation analyses support one panmictic population including Lake Arcadia and UCO with nongeographic genetic structure. We conclude there was either a single introduction to both locations or multiple introductions with high gene flow. Additionally, the social structure of each colony was determined using the Gp-9 locus. Based on colony sizes, we predicted most colonies at UCO and Lake Arcadia would be polygyne. Two colonies at UCO and two at Lake Arcadia were monogyne; all other colonies were polygyne.

2:00 - 2:15

BREAK

2:15 - 2:30

Mosquito Diversity in San Angelo, Texas

Mattie Price, Department of Biology, Angelo State University, San Angelo, TX

There are approximately 85 different species of mosquitoes in Texas, 20 of which are reported in Tom Green County. Some of the diseases carried by mosquito species reported in the San Angelo area are encephalitis and filariasis, but other diseases such as dengue, yellow fever, and malaria are transmitted by mosquito species found in other areas of Texas. To document the most common species present in October and November, I collected mosquitoes from several sites in San Angelo. Mosquitoes were collected using a commercially available CO₂ trap. To date, I have collected *Psorophora columbiae*, *Anopheles pseudopunctipennis*, *Anopheles judithae*, *Ochlerotatus hendersoni*, *Mansonia titillans*, *Anopheles punctipennis*, *Culex erraticus*, *Anopheles crucians*, *Anopheles perplexens*, *Anopheles barbei*, *Anopheles atropos*, and many unidentifiable mosquitoes. Of these, the most common species are *C. erraticus* and *A. pseudopunctipennis*. Knowing the mosquito species in our area will help public health officials identify medical issues that could potentially develop in the San Angelo area. I would hope this information would influence individuals to take safety measures against mosquitoes to reduce the chance of acquiring vector-borne diseases. Also, this information may educate people to be more aware of these potentially harmful organisms and realize that these common “pests” are actually more dangerous than they appear.

2:30 - 2:45

Escalation of Respiratory Support in Pediatric Patients Initiated on HFNC during ED Management

Hailey Hardgrave, Shane McKinney, M.D., Elizabeth Storm, M.D., and Thomas Abramo, M.D. University of the Ozarks, Arkansas.

Respiratory distress is a common cause of emergency department (ED) visits and hospitalizations in pediatric patients, and is often secondary to viral infections such as bronchiolitis or croup, bacterial infections like pneumonia, or asthma exacerbation. Pediatric respiratory distress may require respiratory support, such as supplemental oxygen via nasal cannula, continuous positive airway pressure (CPAP) generators, high concentration face mask, intubation and mechanical ventilation, or high flow nasal cannula (HFNC). HFNC provides non-invasive respiratory support by delivery of heated and humidified air and oxygen at a rate greater than the patient's inspiratory flow, acting to decrease work of breathing and improve oxygenation. Observational studies indicate HFNC as potentially advantageous over alternative methods of non-invasive respiratory support with the treatment appearing to reduce resistance to treatment, sensation of respiratory distress, and mouth dryness as compared to other interventions. In addition to potential increase in patient comfort, HFNC may work to improve physiological symptoms by overcoming oropharyngeal dead space and CO₂ rebreathing, concerns often more prevalent in pediatric patients. Considering all features of HFNC, it shows potential for use in pediatric EDs as an early respiratory intervention aimed to improve respiratory distress, lower risk for escalation of care, and ultimately provide for the continued health of the pediatric patient. This study aims to accumulate and evaluate the use of HFNC in all-cause respiratory distress, looking for trends, predictors, and clinical indicators that may augment and guide early clinical management in terms of non-invasive vs. invasive respiratory support, high vs. low risk for intubation, at risk populations, etc. in pediatric patients. Pending additional data collection, results will be evaluated to further investigate HFNC as a preferable method of non-invasive respiratory support in patients seen in the pediatric emergency department.

2:45 - 3:00

Testing For Antibiotic Resistance in *Propionibacterium acnes* Using Polymerase Chain Reaction (PCR)

Nemil Bhatt and Jacqueline Peltier Horn, PhD. Houston Baptist University, TX.

Propionibacterium acnes is a rod-shaped, aerotolerant anaerobe, and the dominant inhabitant of the sebaceous glands. Although its presence is ubiquitous, *P. acnes* is also thought to play a pathogenic role in acne vulgaris, primarily through an inflammatory response. The treatment of acne vulgaris involves the use of anti-inflammatory drugs and the reduction of the population of *P. acnes* through administration of antibiotics, particularly tetracycline. As seen in many bacteria, the overuse of tetracycline has caused tetracycline resistance in *P. acnes*, making it more difficult to treat. Tetracycline resistance in *P. acnes* is result of a specific guanine to cytosine mutation on the 16 rRNA gene. Patients may have antibiotic resistant *P. acnes* naturally present in their sebaceous glands; however, they are limited by other bacteria and the immune system. After administration of antibiotics, the tetracycline susceptible *P. acnes* are eliminated and the tetracycline resistant *P. acnes* proliferate. In order to reduce the use of tetracycline for non-lethal pathogens, a rapid Polymerase Chain Reaction (PCR) test for tetracycline resistance, is needed. By designing primers complementary to the point mutation on the terminal 3' end, tetracycline resistant bacteria can be detected using PCR. Preliminary PCR results illustrate the detection of resistant bacteria from susceptible ones in samples collected from a local dermatology clinic.

3:00 - 3:15

Habitat Selection, Nest Box Usage, and Reproductive Success of Secondary Cavity Nesting Birds in a Semirural Setting

Alanah Hosford. Oklahoma City University.

As urban areas continue to grow and erode rural landscapes, it is critical to characterize essential habitats for all wildlife in order to set aside protected areas in an attempt to maintain diversity. I constructed and monitored 30 nest boxes for usage by secondary cavity-nesting birds each year from 2014-2016 at the John Nichols Scout Ranch located in southeast Canadian County, Oklahoma. At each of six sites, five nest boxes were situated along a transect at 15m intervals with a central box located at an abrupt edge between a wooded habitat and a grassland habitat. I measured 77 habitat variables around each nest box at 2 sampling scales, 1m² and 10m². I used these habitat variables and sites in which nesting occurred in a principal components analysis. Eastern Bluebirds and Carolina Chickadees nested in grassland habitats with little to no overhead canopy cover. Carolina Wrens nested in woodland areas with high amounts of litter ground cover and overhead canopy cover. Results at both spatial scales were similar. I used the simplified Morisita index to calculate niche overlap at both spatial scales. Overlap varied substantially depending on sampling scale.

3:15 - 3:30

Transcriptomic Analysis in an Avian Model of Maternal Phenylketonuria (A graduate student presentation)

Jamie N. Watson and Nikki Seagraves. University of Central Oklahoma.

Maternal PKU is a disease that affects embryos exposed to high levels of Phenylalanine (Phe) from mothers with PKU. This results in severe cardiac and cranial defects. It is not known which genes in the developing embryo are differently expressed in the presence of high Phe.

Methods. Fertilized chicken eggs were treated with 2500uM PHE through yolk injection at HH6. Embryos were incubated until HH14 and then dissected. The head/cranial region and the thoracic/cardiac region were dissected. For the control group, 3 embryos were pooled and 2 embryos were used for treated for a total of 3 samples. RNA was isolated and shipped to Applied Biological Materials for enrichment for mRNA, library construction, and sequencing on the Illumina NextSeq500. Data was analyzed with the open source software Galaxy Suite.

Results. Cufflinks was used determine differential gene expression. In cranial tissue we found 6 differentially expressed genes ($q \leq 0.05$). In cardiac tissue, we observed 10 differentially expressed genes ($q \leq 0.05$.)

Discussion. Based upon the RNA-Seq data we have analyzed, in the cardiac tissue there are two differentially expressed genes found in the retinoic acid (RA) pathway, Retinol Binding Protein 4 (RBP4) and Transthyretin (TTR). In review of the literature RA signaling is important in heart development and increases or decreases in levels of RA can cause significant developmental defects.

Poster Presentations (Patton Chapel)

Morning Session (10:00 - 11:30 AM) - Blue labels (#1-9)

Poster 1:

Amelanism in Snakes as a result of an LTR-retrotransposon Insertion in OCA2 gene

Aaron Benavides. Texas Wesleyan University, Fort Worth, Texas.

Pantherophis guttatus, more commonly known as the corn snake, can display various color patterns including amelanistic forms in which the dark pigment melanin is not produced. These snakes are not albino since red and yellow pigments may still be produced. Amelanism has been associated with a mutation in the gene OCA2 (oculocutaneous albinism). The mutation was recently found to be caused by the insertion of a transposon, a moveable genetic element, into the OCA2 gene, resulting in the production of a nonfunctional protein. I have been attempting to amplify the part of the OCA2 gene that includes the mutation – an intron between exons 11 and 12. The OCA2 gene was found to be highly conserved across several species of snakes, influencing me to believe that the same mutation should be observed in amelanistic forms of other snake species as well. In order to support this hypothesis, I hope to successfully identify the same mutation in an amelanistic form of the ball python (*Python regius*).

Poster 2:

Morphological responses of select microorganisms to soil isolates

Danielle Molotsky and Crosby Jones. Department of Biology, Angelo State University, San Angelo, TX.

Scientists originally thought that *Streptomyces* bacteria secrete antibiotics that may provide an advantage over other microorganisms found in the soil. However, recent evidence has suggested that the production of antimicrobials is a form of communication between microbes. The purpose of my project is to gain some understanding of the interactions between soil microorganisms. Specifically I am interested in the changes in cell shape, Gram stain, and pigment production. To do this I isolated seven different microbes from San Angelo soil and streaked them against each other, molds found concurrently in the soil, and a select collection of Gram positive and Gram negative bacteria. The isolates were five *Streptomyces* strains and two molds that differ in strength, range, and target of their antibiotic. Preliminary results have shown communication between the isolates and the non-antibiotic producing bacteria. Furthermore mold isolates appear to interact with *Streptomyces*. However, molds did not show an effect on other molds and *Streptomyces* samples did not show an effect on other *Streptomyces* samples. From here I will test the reproducibility of these results.

Poster 3:

Searching the soil for new antibiotics

Frederick Cramer and Alex Silvagnoli. Baylor University, Waco, TX.

The purpose of the Small World Initiative is to find bacteria from the soil that inhibit the growth of six common pathogens, otherwise known as ESKAPE pathogens. After obtaining a 20 gram soil sample from the coordinates 31°33'02.9"N 97°07'01.3"W, the sample was diluted to obtain a total of ten isolated bacteria colonies. Our group then tested these ten isolates on agar plates covered with each individual ESKAPE pathogen to determine if the isolates exhibited antimicrobial activity. Of the ten isolates obtained, only three showed antimicrobial activity. Isolate 3.1 inhibited the growth of *Staphylococcus aureus* and *Enterococcus faecalis*. Isolate 3.5 inhibited the growth of *Staphylococcus aureus*, *Enterococcus faecalis*, and *Acinetobacter baumannii*. Isolate 3.8 inhibited *Staphylococcus aureus*, *Enterococcus faecalis*, and *Klebsiella pneumoniae*. Our group then sent our isolates to be 16s rRNA sequenced in order to determine its species using the Basic Local Alignment Search Tool (BLAST). Isolate 3.1, 3.5, and 3.8 most closely match with *Serratia marcescens*, *Pseudomonas monteilii*, and *Pseudomonas resinovorans*, respectfully. To ensure the accuracy of the sequencing, we ran various biochemical tests on the isolates to compare the results we obtained with the results shown on the ABIS website. We also ran various other biochemical tests to further eliminate other bacteria that also closely matched with the results obtained from BLAST. Using these results, we are hopeful to discover new antibiotics that might be used in the fight against ESKAPE pathogens.

Poster 4:

Detection of helix fraying in transmembrane helices with interfacial histidine residues

Amanda Paz Herrera¹, Fahmida Afrose², Denise Greathouse², and Roger Koeppe II²

¹University of the Ozarks, Clarksville, AR; ²Department of Chemistry and Biochemistry, University of Arkansas, Fayetteville, AR

Transmembrane helices of integral membrane proteins often are flanked by interfacial aromatic residues that may serve as anchors to aid the stabilization of a tilted transmembrane orientation. The synthetic neutral peptide GWALP23 (acetyl-GG2ALWLALALALALALWLAG22A-amide) with two interfacial Trp residues has proved to be surprisingly well-behaved with minimal dynamic averaging in a stable transmembrane orientation in lipid-bilayer membranes of varying thickness. To further investigate the effect of interfacial His residues, we have substituted G2 and G22 with histidine in HWALP23 (acetyl-GH2ALWLALALALALALWLAH22A-amide). In addition, to explore the fraying or uncoiling of the ends of the peptide, we have incorporated 2H-Ala labels at positions A3 and A21 (underlined above), which are sensitive to helix integrity, outside the core region of the peptide, to compare the influence of interfacial residues on the extent of unwinding of the helix ends. Solid-state 2H NMR spectra of macroscopically aligned DOPC lipid bilayer samples and in the presence of 10% and 20% cholesterol confirmed that one or both helix ends are frayed in DOPC bilayers alone and in the presence of up to 20% cholesterol. To further understand the effects of histidine in transmembrane helices, we have also substituted W5 and W19 with histidine in GHALP23 (acetyl-GGALH5LALALALALALH19LAGA-amide) with 2H-Ala labels at A3 and A21. "Geometric Analysis of Labeled Alanines" (GALA) shows the extent of coiling or unwinding at the terminals for HWALP23 and GHALP23. It is plausible that the helix fraying may be critical for the stability of the transmembrane helix orientation in lipid bilayer membranes.

Poster 5:

How does microgravity change pathogenicity?

Alina Shrestha, Reem Almutairi and Eric Paul. Southwestern Oklahoma State University, Weatherford, Oklahoma.

An alleviated immune defense is a major issue experienced during spaceflights by astronauts in microgravity conditions. These conditions increase susceptibility to a myriad number of pathogens, and among them are the opportunistic pathogens like *Pseudomonas aeruginosa*; a bacterium usually found in soil, water and on the skin. During space flights, microbes can cause urinary tract, lung, and kidney infections easily.

Two strains of *P. aeruginosa*, PA01 and PA14, were grown in microgravity mimicking condition, using rotating wall vessel reactor and non-rotating horizontal shakers, for a period of 24-hours and 48-hours in Tryptic Soy Broth (TSB). The cultures were tested for differences in motility, growth morphology and zone of inhibition on 0.3% Tryptic Soy Agar (TSA) plates. Furthermore, bioassays using lettuce leaves (for measuring, lengthwise, the zone of necrosis), and using amphipods and meal worms (for counting days taken to kill) were conducted more than four times.

Twitching assays were conducted to observe any enhancement in twitching and disease establishment in microgravity conditions. A significant difference in twitching growth was observed motility plates for 48-hours' culture. An average increase of 12% in colony size and 120% in growth was seen in the cultures grown under microgravity. The strains grown under microgravity had a greater zone of necrosis for lettuce leaves. However, in the case of mealworms, the strain PA14 grown under normal gravity condition was the fastest killer, followed by the same strain grown under microgravity condition. Thus, leading us to reconsider of our earlier hypothesis of higher virulence of *Pseudomonas* in microgravity conditions.

The greater zone of necrosis, enhanced motility and growth led us to believe that *P. aeruginosa* displays increased virulence under micro-gravity conditions as compared to normal gravity conditions. In addition, we are investigating changes induced by microgravity conditions like pH, ionic concentration etc. play in altering infection.

Poster 6:

A Study of the Effect of Riluzole and BAY 36-7620 in Breast Cancer

Ashely Rose, Sonia C. Dolfi, Daniel J. Medina, Aparna Kareddula, and Kim M. Hirshfield. Dallas Baptist University.

Recent evidence suggests that glutamate signaling plays an important role in cancer. Riluzole, a putative glutamate release inhibitor and FDA-approved drug for the treatment of amyotrophic lateral sclerosis, has been investigated as an inhibitor of cancer cell growth and tumorigenesis with the intention of repurposing it for the treatment of cancer. However, the distinct mechanism of action of riluzole is not well understood. In this study, the anti-cancer mechanism of riluzole in comparison to the GRM1-specific inhibitor BAY 36-7620 (BAY) was explored. A panel of breast cancer cell lines was treated with riluzole or BAY to determine effects on proliferation, cell cycle, DNA damage, oxidative stress, and metabolism. While both drugs inhibited cell proliferation, there were other distinct functional effects suggesting that riluzole function is GRM1-independent in breast cancer. Riluzole altered cellular metabolism as demonstrated by changes in oxidative phosphorylation and cellular metabolite levels. Riluzole induced mitotic arrest independent of oxidative stress while BAY had no measurable effect on mitosis. Both drugs induced DNA damage, but BAY had a more pronounced effect. Our results provide a better understanding of the mechanistic action of riluzole in the treatment of breast cancer.

Poster 7:

Characterizing Early Developmental Defects in an Avian Model of Maternal PKU

Morgan Massey and Austin McDonough. University of Central Oklahoma.

Maternal phenylketonuria [MPKU] is a syndrome of multiple congenital anomalies including cardiovascular malformations [CVMs], brain and growth restriction when a mother with Phenylketonuria [PKU] does not control her dietary intake of Phenylalanine [Phe]. In this study, we aim to establish and characterize an avian model of MPKU. We focused on early developmental defects. **METHODS:** We investigated the effect of 2500 μ M Phe exposure by in-ovo yolk injection. Following the injection, the embryos underwent further development for 48 hours until dissection was performed. At HH14-17, India ink was injected into the yolk as a contrast dye. Images were taken of embryos and they were scored based on Drake et. al (2006.) **RESULTS:** Embryos exposed to high Phe displayed gross morphological changes including developmental and growth delays, anterior and posterior abnormalities, and torsion defects. **FUTURE STUDIES:** Histological analysis is underway to determine changes in heart development. Currently there is no data interrogating the mechanism by which Phe causes heart defects. We plan to utilize this model to define the mechanism of Phe cardiac teratogenicity which is critical for improving MPKU treatments and outcomes.

Poster 8:

Positive Regulation of YAP Nuclear Activity via AMOT Expression

Julianna Sherman and Dr. William Ranahan, Oral Roberts University, Tulsa, Oklahoma

Breast cancer is the second most frequently diagnosed cancer in the world, yet its cause is not well understood (Ferlay et al., 2010). Unlike other organs, the mammary ductal system is not fully developed until the lactation cycle following pregnancy (PLC). The PLC includes a total reorganization and growth of the primitive epithelial ductal network. Upon completion of the lactation cycle, these same ductal epithelial cells undergo extensive involution and apoptosis (Khokha and Werb, 2011). Mammary ducts retain sensitivity to pro-growth and pro-apoptotic signals, throughout the reproductive years, sensitizing the organ to aberrant signaling.

For an epithelial to mesenchymal transition to occur, epithelial cells lining the mammary duct must lose their intracellular organizational structures. Loss of polarity results in dedifferentiation of the epithelial tissue and sensitizes the cell to pro-growth signals (Sternlicht, 2006). The intrinsic capacity of epithelial cells to repurpose their polarity constituents and promote growth results in the mesenchymal transition and metastasis. One of the key players in organ size control, Yes-Associated Protein (Yap), an apical junction associated protein that is found in the nucleus, has been shown to function in the role of a transcriptional co-activator that promotes both growth and dedifferentiation (Pan, 2010).

This project combined cutting edge technology (3D Matrix organogenesis modeling) with traditional biochemical techniques to investigate the role of Amot in promoting Yap nuclear activity within the context of mammary cancer initiation and progression. This project focused on a type of breast cancer, "triple negative," which has no current drug therapy. These data suggest that Amot expression results in an organ overgrowth phenotype in mammary epithelia likely due to increased nuclear Yap activity. Therefore, it is likely that Yap is being translocated from the tight and adherens junctions by complexing with Amot which results in upregulation of nuclear Yap activity.

Poster 9:

Stimulation through innate immune receptors selectively upregulates co-receptor expression on B cells

Ashna Dhoonmoon and Christopher G. Horton, Southwestern Oklahoma State University, Weatherford, Oklahoma.

T lymphocytes require two signals for appropriate activation – signal one is obtained via antigen presentation to the T cell receptor and signal two is provided by a co-receptor. In the absence of signal two, T cells remain unresponsive, thus these accessory proteins serve an essential purpose in an immune response. Co-receptors include two primary classes: co-stimulatory molecules and co-inhibitory molecules. Co-stimulatory molecules including CD80 and CD86, interact with CD28 to promote T cell proliferation and survival, while co-inhibitory molecules such as B7-DC, B7-H3 and B7-H4 limit the strength and duration of immune responses. In addition to orchestrating an immune response against pathogens, co-receptors have also been implicated in several diseases. Numerous studies have revealed abundant expression of inhibitory co-receptors in tumor microenvironments, contributing to tumor immunosuppression. Furthermore, lack of inhibitory signals in mouse models leads to lupus-like autoimmunity. While the rudimentary functions of these receptors are somewhat clear, the contexts in which they are expressed are incompletely understood. In this study, we aimed to fill this knowledge gap by investigating the effects of innate immune stimuli on expression of B7-family co-receptors. Our data demonstrate that stimulation of mouse splenocytes with synthetic Toll-like receptor agonists leads to selective alterations in co-receptor expression, most notably among B lymphocytes. These data suggest an avenue by which detection of conserved microbial motifs may modulate adaptive immunity through regulation of co-receptor expression on antigen presenting cells.

Morning Session (10:00 - 11:30 AM) - Gold labels (#10-18)

Poster 10:

Latent plant pathogenic *diaporthe* species in melons native to Oklahoma and imported from Central America.

Hannah Taff¹, Jacob Grimm¹, Matt Broge¹, Charlie L. Biles¹, Alisha Howard¹,
Keshav Karki¹, Benny D. Burton²

¹East Central University, Department of Biology, Ada, OK

²United States Department of Agriculture, Agricultural Research Service, Lane, OK

Phomopsis rot of melon fruit (*Cucumis melo* L. var. *cantalupensis* Naudin) is caused by fungi of the *Diaporthe* species. The objective of this study was to characterize pathogenic *Diaporthe* spp. found in Oklahoma melons and compare them to pathogenic *Diaporthe* spp. in melons originally imported from Central America to investigate if these fungi are migrating and contaminating native Oklahoma melons. Fungal pycnidia and spores were examined microscopically to separate *Diaporthe* spp. isolates cultured from sunken surface lesions from other fungi in melons. DNA was extracted from fungal hyphae. ITS1 and ITS4 primers were used in the DNA amplification reaction. Purified polymerase chain reaction (PCR) products were sent for Sanger DNA Sequencing. Twenty *Diaporthe* spp. were isolated from Atoka, Oklahoma, four isolates were isolated from imported Guatemalan melons, and six isolates were isolated from Costa Rican melons. Three of the Costa Rican isolates were similar in spore type to *D. melonis* and *D. ueckerae*, and three were similar to *D. sojae* and *D. curcurbitae*. Three of the Guatemalan isolates were also similar in spore type to *D. sojae* and *D. curcurbitae* and one was similar in spore type to *D. melonis* and *D. ueckerae*. Sequencing analysis demonstrated that isolates from Costa Rica and Guatemala are distinct from Oklahoma isolates.

Poster 11:

Determination of the Monarch Butterfly (*Danaus plexippus*) natal origins

Erica McGill, Texas Wesleyan University, Fort Worth, Texas.

The monarch butterfly (*Danaus plexippus*) is endangered due to habitat loss in the Midwest US and Mexico. This species annual migrations are threatened phenomena. The spring migration from Mexico to the Midwestern US is driven by pursuit of fodder for monarch larvae. *Danaus plexippus* is dependent on species of milkweed (*Asclepias* spp) that provide nutrition and defense for larva and adult. Forty species of *Asclepias* serve as a food source and protection for developing larvae. Conservation of *Asclepias* species is necessary for avoiding extinction of monarch butterflies. The aim of this research is to develop a method that will permit identification of the *Asclepias* species that provided the larva's food source, thereby documenting individual insect's natal origin. Using plant DNA barcoding techniques on insect tissue can identify larval food source and natal origin, if the larva sequesters plant DNA. Because each *Asclepias* species has its own specific geography range, determination of the *Asclepias* species that was the food source for larval development leads to the determination of the insect's geographic range for natal origin. Primers designed to amplify taxonomically informative DNA sequences have successively amplified bar codes from fresh leaf material and from insect frass.

Poster 12:

Analysis of autophagy and its effects on the D-type motor neuron circuitry of *unc-33* mutants of *Caenorhabditis elegans*

Tyler Mitchum, Whitnie Holten and Andrea Holgado

Department of Biological Sciences, Southwestern Oklahoma State University.

The synapses between neurons are important for normal functioning of the central and peripheral nervous systems. Moreover, the proper growth and guidance of axonal projections is essential for the connections between these neurons to be formed. It is well documented that UNC-33/CRMP-2 plays an important role in axonal guidance in multiple animal models. The current theme of our lab focuses on the hypothesis that the cellular recycling process known as autophagy plays an important role in axonogenesis, and that UNC-33/CRMP-2 is involved in the mechanistic action or regulation of autophagy. To investigate this theme, we took advantage of the alternative energy conserving larval stage of *C. elegans* known as the dauer stage. To do this, we grew *unc-33;daf-2* double mutant strains of *C. elegans* in high temperatures to induce stress, causing them to form dauers. We used these dauers to observe the effect of induced autophagy on the nervous system of *unc-33* mutant *C. elegans*. Wild type *C. elegans*, *unc-33* null mutants (*mn407*), and *unc-33* hypomorphs (*e204*), all harboring the *daf-2* mutation were grown under normal and elevated temperatures. Stressed animals were treated with 1% SDS solution to isolate all dauers that were present. Fluorescent microscopy was used to evaluate the D-type motor neuron circuitry of transgenic versions of these strains that expressed GFP in these cells. We observed that the circuitry of the D-type motor neurons of dauers resembled that of a fully developed adult animal. We also found that in addition to their defects in neuronal development, *unc-33* mutants were deficient in dauer formation, suggesting that they are also autophagy deficient. However, our fluorescent imaging results suggest that the induction of autophagy has adverse effects on the development of the *unc-33* mutant nervous system.

Poster 13:

Aminopeptidase A (PepA) and the regulation of the *qseBC* and *ygiWV* operons in *E. coli*

Aya Elalfy, Texas Wesleyan University, Fort Worth, Texas

Enterohemorrhagic *E. coli* (EHEC) is a virulent, gram-negative bacterium that causes hemorrhagic colitis. The operons *qseBC* and *ygiWV* are both involved in promoting virulence of several pathogenic microbes, including EHEC. The promoters of these operons overlap in an intergenic region that has been found to bind several regulatory proteins, such as IHF and QseB. Aminopeptidase A (PepA) is another protein that has been found, in a recent unpublished study, to strongly bind the operons' promoter region. Several studies suggest that PepA is involved in the regulation of virulence in numerous pathogenic microbes. Therefore, we hypothesized that PepA is a regulator of the *qseBC-ygiWV* operons. To investigate the regulatory function of PepA in *E. coli*, a PepA deletion mutant would first need to be created. For this specific aim, we hypothesized that a PepA deletion mutant could be deleted using Lambda Red recombineering technology because other researchers have done so successfully. First, we transformed wild-type *E. coli* (MG1655) with the Lambda recombinase plasmid (pKD46). Antibiotic selection results confirmed that MG1655 was successfully transformed with pKD46. We then PCR amplified Chloramphenicol (Cm) resistance cassette and visualized PCR products using gel electrophoresis. Expected band for the Cm cassette at 1.1 kb indicated successful amplification of the resistance cassette. Finally, we attempted to transform MG1655 (pKD46) with the Cm resistance cassette. Antibiotic selection and PCR verification results both indicated the failure of this experiment. Troubleshooting and additional transformation attempts are being performed to obtain the PepA deletion mutant.

Poster 14:

The Role of Eip63E in *Drosophila* Axonal Transport

Susan Sprague, Pearl Anne Henry and Susan Klinedinst. Schreiner University.

A critical element of the neuronal cytoskeleton is the network of microtubules that provides structural support, allows motility and serves as a transportation network for the organized movement of molecules within the neuron. The microtubule cytoskeleton is critical for the normal functioning of the nervous system and dysfunction of the microtubule cytoskeleton appears to make significant contributions to neurological diseases including amyotrophic lateral sclerosis (ALS), Alzheimer Disease and Huntington Disease. The central focus of this project is to characterize the potential role that Eip63E plays in *Drosophila* axonal transport. Eip63E is a kinase that has homology to a family of mammalian cyclin dependent kinases (Cdks) called PFTAIREs, whose function is currently poorly understood. Cdks are traditionally involved in regulating cell cycle progression, however some Cdks functions include neuronal apoptosis, neuronal migration, axon guidance, synaptic transmission, and membrane transport. We have begun to characterize the role of Eip63E, which has been shown to genetically interact with both molecular motors, Dynein and Kinesin in *Drosophila*. We hypothesize that the Eip63E PFTAIRE functions as a regulator of one of these neuronal functions of Cdks. Our data thus far indicates that Eip63E functions in axonal transport and is required for the proper delivery of presynaptic vesicles and active zones to the presynaptic axon terminal.

Poster 15:

Investigating the role of biosurfactants in *Pseudomonas syringae* motility and attachment

Laci Johnston and Regina McGrane. Southwestern Oklahoma State University, Weatherford, OK.

Pseudomonas syringae, a recognized pathogen of economically-important crops, utilizes a coordinated movement called swarming during leaf colonization. Studies of this organism are considered meaningful because they enhance our understanding of plant-bacterial interactions and help prevent pathogen destruction of crops. *P. syringae* is a nutritionally-adaptable, opportunistic pathogen that flourishes and is able to seek out heterogeneously distributed nutrients by moving on the leaf surface. *P. syringae* produces two distinct biosurfactants which reduce surface tension and serve as lubricants, syringafactin and 3-(3-hydroxyalkanoyloxy) alkanoic acid (HAA), which have both been implicated in swarming. RhIA is responsible for the synthesis of the biosurfactant HAA, and SyfA is required for the synthesis of syringafactin. In an effort to further investigate the role of these biosurfactants in pathogenicity behaviors, deletion strains Δ rhIA, Δ syfA, and Δ rhIA Δ syfA were compared to the wild type strain in swarming conditions, and migration measurements and tendrils formation were quantified. We observed Δ rhIA had similar migration capabilities to the wild type and that the wild type and Δ rhIA exhibited greater swarming than Δ syfA or Δ rhIA Δ syfA, which both demonstrated little to no movement. Additionally, we demonstrated Δ rhIA produced significantly fewer tendrils compared to the wild type, which leads us to hypothesize that HAA plays a repulsive role in tendril development. Due to the dual roles of many motility factors in early stages of biofilm development, deletion strains were also compared to the wild type in their ability to attach to leaf surfaces. We hypothesize the altered swarming capabilities of Δ rhIA, Δ syfA, and Δ rhIA Δ syfA will negatively impact their ability to form firmly attached aggregates on common bean leaves. Future work will evaluate the ability of deletion mutants to form biofilms, colonize protected leaf sites, and induce disease symptoms. Collectively, this project provides insights into the importance of biosurfactants in the *P. syringae* life cycle.

Poster 16:

The role of NahG, a putative salicylic acid hydroxylase, in induced plant resistance

Bradly Burke and R. McGrane. Southwestern Oklahoma State University, Weatherford, Oklahoma

Pseudomonas putida is a bacterium found in the rhizosphere. Previous research suggests *P. putida* can induce plant resistance to infection by *Pseudomonas syringae*, a bacterial pathogen that causes halo blight. During *P. putida* induced resistance in *Arabidopsis thaliana*, the salicylic acid-mediated plant defenses are triggered in addition to jasmonic acid and ethylene defense pathways. This is unique because most bacteria stimulate systemic resistance by triggering only the jasmonic acid and ethylene mediated-defenses. We found the *P. putida* gene, PP_3944, shares sequence identity with known salicylic acid hydroxylase genes (nahG), which function in salicylic acid degradation. We hypothesize *P. putida* uses salicylic acid as a carbon source via NahG and in turn primes a variety of plants against infection. Our preliminary data shows *P. putida* can utilize salicylic acid as the sole carbon source for growth. Additionally, we are evaluating the regulation of nahG under various conditions commonly encountered by bacteria in the rhizosphere. To do this we have introduced the nahG promoter into a bioreporter plasmid to control GFP expression. We are also working to construct nahG deletion and overexpression strains to evaluate NahG's role in inhibiting *P. syringae* infection.

Poster 17:

The rip-1 gene is required for normal neurotransmission in the nematode *Caenorhabditis elegans*

Paige Eberle, John McManus, Angie Duke, Dennis Frisby, Kiely Grundahl, Ellie Mathews, Michaela Metts, Jim Rand, and Greg Mullen. Oklahoma City University.

Neural synapses are specialized sites of communication between neurons and their target cells. Neurons release signaling molecules called neurotransmitters, which evoke specific responses in target cells, such as nerve depolarization or muscle contraction. Members of the Piccolo-Bassoon-RIM family of proteins share a core set of structural features, and have been shown to play roles in neurotransmitter release. We identified a member of this family in the nematode *Caenorhabditis elegans*, which we named RIP-1 (for RIM-Piccolo homolog). The rip-1 gene gives rise to two large transcripts encoding proteins with similarities to Piccolo and Bassoon, and two smaller transcripts, one of which encodes a RIM-like protein. The RIP-1 proteins are expressed in neurons, and are localized to discrete puncta in synaptic regions. rip-1 mutants are viable and superficially wild-type in appearance, development, and behavior. However, they have mild deficits in synaptic transmission, and they enhance the behavioral and synaptic phenotypes of RIM-deficient unc-10 mutants. We suggest that the function(s) of the RIP-1 and RIM proteins are at least partially redundant.

Poster 18:

***Pseudomonas aeruginosa* storage viability on various laboratory media**

Laura Cruz and Crosby Jones. Department of Biology, Angelo State University, San Angelo, TX

Pseudomonas aeruginosa is a bacterium that opportunistically infects patients that are immune-compromised, have severe burns, or have cystic fibrosis. This pathogen possesses an arsenal of virulence factors. Among the most important are its ability to produce slime and biofilms, as well as the ability to produce a pigment called pyocyanin. Earlier observations in our laboratory determined that this species demonstrated variable appearance and viability depending upon the growth medium that it was stored upon. I investigated this phenomenon in closer detail. Eight different types of nutrient media (5 plates of each) were inoculated using a fresh 24-hour culture and incubated for 2 days, then placed in a refrigerator for cold storage. Following a week of cold storage, the plates were temporarily removed and used to prepare a spot inoculation on tryptic soy agar to determine viability. This method was performed weekly. I also recorded colonial consistency and changes in pigmentation in conjunction with exposure to long wave ultraviolet light. Documentation of data was accomplished photographically. I observed that the first set of cultures to lose viability were the Mueller Hinton agar plates, where the slime production was high and the fluorescence had faded by the close of week 4. Results of all the viability tests will be reported.

Afternoon Session (1:30 - 3 PM) - Blue labels (#19-27)

Poster 19:

Response of Great-Tailed Grackle to indirect auditory evidence of predator presence

Uriel Minjares and Benjamin Skipper. Department of Biology, Angelo State University, San Angelo, TX.

Predator detection is a key behavior promoting survival of individuals. Animals rely on numerous direct sources of information to be aware of nearby predators. These sources include, visual, olfactory, tactile, and auditory information on predator presence. Additionally, individuals may utilize indirect information regarding predator presence. Such indirect information has been termed eavesdropping and notable examples include the use of alarm calls emitted by heterospecifics. Another potential cue in urban area may be the flushing noise that is created when a large number of birds are disturbed. The degree to which indirect information is used by birds is currently unknown. We investigate the use of an indirect auditory cue (flushing noise) by Great-tailed Grackles within the city of San Angelo, TX. Grackles were exposed to acoustic signals of pigeons flushing and their behaviors were compared before and after the flush noise was played. We observed no significant difference between the behaviors exhibited by Grackles before and after exposure to flush noise.

Poster 20:

Exploring Possible Links Between Saliva Composition and Vector Competence in Mosquito Species

Melissa Penton, Michael Bay and Elizabeth McCarn. East Central University, Ada, Oklahoma.

The most competent vector in the world, mosquitoes are the number one killer of modern man. As carriers of a variety of diseases, mosquitoes are capable of infecting many mammal species. Notably, mosquitoes are carriers of various species of malaria, West Nile virus, and heartworm (*Dirofilaria*). Part of mosquitoes' efficiency as a vector is their ability to transmit the diseases they carry. Through the process of feeding on a host, a mosquito will introduce saliva into the host's blood vessels. This process injects not only the various anticoagulant proteins that compose mosquito saliva, but also pathogens parasitizing the mosquito. While some of these diseases indiscriminately infect the varying species of mosquitoes, others are far more selective, infecting only certain genera or species. More study is needed to determine the numerous components of the mosquito's genetic and physical make up to determine what makes some species preferable to others for disease transmission. There is some indication that subtle differences in the salivary proteins between species could be an effective indicator of vector competency or infection. To explore this possibility further, we collected native Oklahoma species over a period of several months and dissected their salivary glands. The dissected glands were used for a protein extraction process to explore the difference in protein composition between the various collected species.

Poster 21:

Foraging Preferences in Aquatic Hemipterans

Allison Statton and Rickey Cothran. Southwestern Oklahoma State University, Weatherford, Oklahoma.

Belostoma sp. and *Ranatra sp.* are two groups of predatory hemipterans that are commonly found in the littoral zones of aquatic environments. Both species are known to feed on a variety of other macro-invertebrates such as amphipods, snails, and damselfly naiads, which could lead to competition between the two species. A shift in resource utilization through species-specific prey preferences may lessen competition and allow for both species to occupy the same habitat. We hypothesized that differences in predator shape (beak length and foreleg structure) could influence foraging preferences because of variability in the shape and size of prey species. We tested for differences in foraging preferences by setting up arenas containing two predators of the same species and seven each of the three prey species (amphipods, snails, and damselfly naiads) with *Elodea* to provide structural complexity for both the predators and prey. The systems ran until approximately sixty percent of the prey had been consumed. We found that *Belostoma sp.* exhibits a preference for snails and an avoidance of damselfly naiads, while *Ranatra sp.* exhibits a preference for amphipods and a strong avoidance of snails. Our results suggest that *Belostoma sp.* and *Ranatra sp.* primarily feed on different prey items, which may contribute to long-term coexistence in the littoral zone of lakes.

Poster 22:

Identification of putative amate paper found in Huitzilapa Shaft Tomb

Debora Sainz. Texas Wesleyan University, Fort Worth, Texas

Amate paper was found in the Huitzilapa Shaft Tomb, Jalisco, Mexico. This amate paper is the earliest - 74 C.E. - evidence of papermaking in Mesoamerica. We hypothesize that this amate paper was manufactured from the bark of fig trees (*Ficus* spp.). More than 21 *Ficus* species occur in Mexico, six of which are endemic. Few of these species have universal bar code sequences in national or international data banks. Correct identification of the amate paper will require bar coding many Mexican *Ficus* species. DNA extraction and amplification of taxonomically informative bar code sequences have been successful. Oligonucleotide primer sets have been developed using the consensus sequences of Mexican *Ficus* species. Extraction and amplification of ancient DNA from herbarium vouchers of *Ficus* spp and the amate paper is ongoing.

Poster 23:

Aerotolerance of *Campylobacter jejuni* and *Campylobacter coli* Isolated from Various Retail Meat and Liver Products

Kaitlin Mar, Anand B. Karki, and Mohamed K. Fakhr. University of Tulsa, Tulsa, OK.

Campylobacter is a gram negative, microaerophilic bacteria and a common foodborne pathogen in the US causing approximately 1.3 million cases of Campylobacteriosis each year. In rare cases, *Campylobacter* can also cause the Guillain-Barre syndrome which can be fatal. Higher prevalence of *Campylobacter* species (*C. jejuni* and *C. coli*) has been reported in retail meat and liver products and was associated with human clinical cases. Despite being microaerophilic, aerotolerance capability of some *Campylobacter* isolates was recently reported and can increase the transmission and survival of those strains in foods during stressful processing and storage conditions. In this study, screening for aerotolerance was performed for 81 *Campylobacter* isolates (49 *C. jejuni* and 32 *C. coli*) which were previously isolated from chicken meat, chicken liver, chicken gizzard, turkey, pork and beef liver. Bacterial cultures were incubated aerobically in Mueller Hinton Broth with shaking at 200 rpm, and viable cell count was done at 0, 6, 12 and 24 hours. About one fourth of the total isolates (24.7%) were found to be aerotolerant (viable after 12 hrs under aerobic incubation) whereas 12.3% were hyperaerotolerant (viable after 24hrs aerobic incubation). Higher prevalence of aerotolerant strains was found among *C. coli* isolates 16/32 (50%) when compared to the *C. jejuni* 4/49 (8.2%) ones. Also twenty five percent (8/32) of the *C. coli* isolates were hyperaerotolerant. All *C. coli* isolates from chicken gizzard and 63.6% of chicken liver isolates were aerotolerant. Similar rate of aerotolerant strains of *C. jejuni* and *C. coli* (25%) were found among beef liver isolates. In conclusion, aerotolerant *Campylobacter* strains are prevalent among those isolated from various retail meats which might contribute to increasing each survival and transmission leading to more clinical cases. *Campylobacter coli* appear to be more aerotolerant than *Campylobacter jejuni*.

Poster 24:

Pick Your Poison: Sublethal Effects of Pesticides on Amphipod Life History, Physiology and Behavior

Lindsey Hendricks and Rickey Cothran. Southwestern Oklahoma State University, Weatherford, Oklahoma.

Understanding sublethal effects of pesticides is critical because most pesticides are found in low concentrations in nature, which may harm organisms but not kill them. Sublethal effects are understudied and we know little of how they affect ecosystems. I explored the sublethal effects of malathion on life history traits of *Hyalella* amphipods. Two populations were collected in western Oklahoma, that differ in proximity to agriculture, and were exposed to one of three concentrations of malathion: a no malathion (0 $\mu\text{g/L}$), a low sublethal concentration (0.005 $\mu\text{g/L}$), and a high sublethal concentration (0.02 $\mu\text{g/L}$). Amphipods that had reached reproductive maturity were chosen for the experiment and monitored until two broods of offspring were produced. For both sexes, I measured growth rate. For each female, I recorded the number of offspring to measure fecundity. For males, I measured gnathopod (a claw-like appendage) size, which is a sexually selected trait. I predict that the amphipods in the high concentration treatment will have slower growth rates, lower fecundity, and smaller claws than those exposed to lower concentrations. I also predict that the population closest to agriculture will be less affected by the pesticide. If malathion negatively affects amphipod life history traits, amphipod populations will decrease. Changes to the populations can also affect community and ecosystems because amphipods are grazers, detritivores, and prey for fish and predatory invertebrates.

Poster 25:

Generation of pigment mutants of *Staphylococcus aureus* and subsequent antibiotic testing

William H Mears, and Crosby Jones. Department of Biology, Angelo State University, San Angelo, TX.

Staphyloxanthin is a golden pigment that is produced by the bacterium *Staphylococcus aureus*. This pigment is a virulence factor for the bacterium and is hypothesized to have the dual function of acting as an antioxidant to protect against action of oxidizing agents, a common form of immune response in the human body, and stabilizing the cell membrane, much like cholesterol does in human cells. In this experiment, mutants with little or no staphyloxanthin were successfully created using UV light. These mutants were then tested against various agents, including oxidants such as hydrogen peroxide and pyocyanin, to determine if there was a difference in bacterial response between the mutants and the wild type, or non-mutated, bacterium that still produced the staphyloxanthin pigment. I hypothesized that the lack of staphyloxanthin would cause the mutant bacteria to be more drastically affected by the oxidizing agents. This was tested using a standard Kirby-Bauer method where the test compounds are impregnated into standard filter paper discs and tested against lawns of bacteria. Zones of inhibition were measured at 24 and 48 hours. Among other data recorded was the influence on pigment production of the various test compounds. Preliminary results indicated that a difference existed in the responses of the wild type and mutant bacterial samples, however, further testing will be required to determine the statistical significance and extent to which this is true.

Poster 26: Visualizing Bioart: A Scientific, Educational, and Artistic Interpretation of Biomolecules

Darby Heard and Alisha Howard. East Central University, Ada, Oklahoma.

This project represents an intersection of biology and art into one entity of Bioart using three main aims. The first will be to utilize the bioinformatics of 3-Dimensional (3D) modeling of biomolecules to determine the 3D structure of the viral oncoprotein from its protein sequence. When considering the functioning of Human T-Cell Leukemia Virus, the structure of Tax has been found to be resistant to attempts to solve the structure by crystallography. Tax creates protein-protein interactions with CREB, an endogenous human transcriptional activator which binds to an off-consensus cAMP responsive element (CRE) in the viral promoter DNA. Tax also binds to the GC rich DNA which immediately flanks either side of the off consensus CRE. Subsequently, the CREB-Tax-vCRE DNA complex will attract the coactivator CREB-binding protein (CBP) or the paralogous p300, causing the activation of transcription (Mick and Currer). Moving from the abstract representation of these modeled molecules into the tangible dimension, the second project goal provides an educational application of 3D printing in the sciences; the molecules selected for this aim will be geared towards use either for class or for outreach. Within the learning environment, it has been suggested that a tactile learning holds more success than traditional 2D figures. Modeling, therefore, has the advantage of utilizing multiple senses in the learning process. Even just being able to rotate an object and view it from multiple angles can allow new details to be considered when studying and analyzing (Horowitz). 3D printing provides a realistic method by which biologically accurate 3D models can be generated for educational purposes. This provides a great advance for biological education, particularly molecular biology. Finally, the project culminated in the development of a Bioart show entitled "Multipotent," which reflects a personal experience with visualizing regenerative research in both 2D and 3D space. The fine arts and the STEM fields often do not mingle in our preconceived notions. At face value they appear disparate, however, in many ways they work in tandem. It is at the juncture of the scientific qualitative and the artistic inquiry where I conceptualize my work. With the advent of biotechnology and regenerative medicine, the manipulation of biology and the very way which our bodies function has been dissected and reconstructed into a view of how biology could potentially function. Within the last few decades, artists have begun to address scientific issues using artistic practices. Bioart has brought about a deeper investigation of the sciences, using both an artist's personal experience and drawing from our understanding of society within these new scientific developments.

Poster 27: *E. coli* and Coliform Contamination of a Primary and Secondary Use Waterway in Clarksville, Arkansas

Julio Molina-Pineda, David Thomas, Caitlyn Bell, and Sean T. Coleman Ph. D, University of the Ozarks, Arkansas.

The existence of a live-chicken processing plant about 20 meters from a water source in Clarksville, Arkansas raises concerns about bacteria contamination in the water. Spadra Creek is a primary and secondary contact body of water that runs through the middle of town. Studies have shown the existence of *E. coli* and other coliforms in the guts of live adult chickens; furthermore, other studies have shown high antibiotic resistance of *E. coli* isolated from processed chicken. The bacterial composition of this water is of high concern due to the close relation of *E. coli* with Urinary Tract and other infections. Over the period of three days, water samples from three different locations (upstream, across of processing plant, and downstream) and for three different types of water (running, stagnant in the middle, stagnant near bank) were collected. Bacteria colonies were grown on 3M *E. coli*/Coliform Petri-Film to identify and count *E. coli* and coliforms. *E. coli* colonies were isolated and antibiotic resistance assays were performed with common antibiotics, including those used for UTI treatment. Coliform and bacterial counts were higher across the chicken processing plant and downstream.

Afternoon Session (1:30 - 3 PM) - Blue labels (#28-34)

Poster 28:

Analysis of Surface Motility Regulation in the Phytopathogen *Pseudomonas syringae*

Chelsea Miller, Sara Hutchinson and Regina McGrane. Southwestern Oklahoma State University, Weatherford, Oklahoma.

Pseudomonas syringae, an opportunistic plant pathogen, senses its environment and alternates between flagella-mediated motilities: swimming, in which the individual bacterium exhibits free range movement in liquid, and swarming, an organized effort to travel across viscous surfaces. Our objective is to introduce bacteria to different stressors to analyze conditions modulating changes between swimming and swarming. We hypothesize *P. syringae* responds to environmental cues like osmotic stress to change between liquid and surface motility behaviors, and this change is partially regulated by switching between low (MotAB) and high (MotCD) powered flagella stators. To test our hypothesis, we inoculated media of varying agar and sodium chloride concentrations. Our results demonstrated cells in 0.25% agar exhibited swimming, while those exposed to 0.3 and 0.35% agar swarmed. Additionally, cells exposed to sodium chloride exhibited enhanced motility on 0.25 and 0.3% agar but were inhibited at 0.35% agar, suggesting osmotic pressure causes a premature switch to swarming on low agar plates. To determine if this switch occurs due to a change from the low to high powered flagella stator, expression of motAB and motCD was evaluated in varied agar concentrations and osmotic stresses. Future studies will evaluate the role of motility regulation in pathogenicity.

Poster 29:

Survey of *Dirofilaria immitis* in mosquitoes in Pontotoc County using PCR

Elizabeth McCarn, Michael Bay and Melissa Penton. East Central University, Ada, Oklahoma.

Dirofilaria immitis, a common filarid nematode that infects domestic dogs, is spread through mosquito vectors. The object of the study was to collect data to further grasp the prevalence of *D. immitis* in the Ada area. There is a lack of scientific studies in the Pontotoc County over *Dirofilaria immitis*. Mosquitoes were collected from two sites, using traps that attracted local mosquitoes with light and carbon dioxide. The collected mosquitoes will then be tested for *D. immitis* using quantitative polymerase chain reaction. Results of this study will show the prevalence of *D. immitis* in mosquito populations in Pontotoc County, OK, and provide a framework for future studies of *Dirofilaria* prevalence in specific mosquitoes that occur in the area.

Poster 30:

The effect of starvation on virulence in *E. coli*

Sami Almohsen. Texas Wesleyan University, Fort Worth, Texas.

Quorum-sensing regulator BC (qseBC) promoter is an essential element for transcription of two operons; qseBC gene and ygiw gene. Three *E. coli* strains were prepared in order to study the effect of leucine-responsive regulatory protein (Lrp) as a global regulator of the qseBC operon. We found that Lrp has a significant effect on the expression of the motility genes under low-nutrient conditions. RNA was isolated in order to run qPCR. However, we faced a contamination of genomic DNA, and Once RNA qualify has been achieved, we will use qPCR to analyze the relative levels of the qseBC promoter and the expression of the two operons and the interactions between Lrp and this promoter.

Poster 31:

Development and identification of affibody molecules that target crotalid snake venoms

Madison Sudduth. Department of Biology, Angelo State University, San Angelo, TX.

Each year in the United States, 7000-8000 people are bitten by venomous snakes, which is a physically painful and financially costly experience which may even lead to death. The Crotalinae subfamily of pit vipers, which includes rattlesnakes, copperheads, and water moccasins, are commonly found in many parts of the U. S., including Texas. CroFab, the current antivenom for pit viper snake bites in the U. S., is derived from antibody fragments harvested from sheep and effectively treats most snake bites, but there are some limitations to the antivenom. In order to expand knowledge of snake venoms and possibly open the door to new antivenom options, an affibody phage display library was used to develop and identify affibody molecules that specifically target Crotalid snake venom proteins.

Poster 32:

Detection of viruses infecting cucurbits in Oklahoma

Kathryn Secrist, Vivek Khanal, Caleb Kalens and Akhtar Ali. The University of Tulsa.

Cucurbits are economically cash crops throughout the continental United States. Many viruses have been reported to infect cucurbits worldwide including the U.S. The major viruses infecting cucurbits include Papaya ring spot virus-watermelon strain (PRSV-W), Watermelon mosaic virus (WMV), and Zucchini yellow mosaic virus (ZYMV). The purpose of this study would be to determine the distribution of cucurbit viruses within Green County (North-Eastern) Oklahoma. During the growing season of 2016, 148 samples were collected from grower's fields in Tulsa and Muskogee counties. All samples were tested individually against the antisera of 10 viruses that includes: Cucumber mosaic virus (CMV), WMV, Cucumber green mottle mosaic virus (CGMMV), Melon necrotic spot virus (MNSV), PRSV, Squash mosaic virus (SqMV), ZYMV, Cucurbit aphid-borne yellow virus (CABYV), Squash leaf curl virus (SLCV), and Cucurbit yellow stunting disorder virus (SLCV). The results showed that the highest incidence was obtained for PRSV (82.5%), followed by WMV (11.9%), and SqMV (5.6%).

Poster 33:

Biodegradation of Polystyrene using Superworms

Beeran Jethwa, Jimena Gonzalez, Emanuela Plummer, Hannah Wingate PhD, and Agnieszka Czopik PhD. Houston Baptist University.

Polystyrene (PS) is a compound that is used to produce Styrofoam, which is commonly used in packaging, and is regularly discarded when it is no longer required. However, owing to its structure, PS is very stable and non-biodegradable, thus when disposed it builds up in landfills, polluting the environment. Recent studies show that mealworms (*Tenebrio molitor*) can digest PS into biodegradable fragments, carbon dioxide and water. However, their consumption of PS requires regular hormone treatments to keep them in a larval phase. We chose to use superworms (*Zophobas morio*) because they remain in larval phase for longer than mealworms without hormonal application to inhibit metamorphosis. We aim to optimize conditions to find maximum rate of PS consumption. Preliminary testing suggests that high moisture leads to increased polystyrene consumption and worm weight. We continue to alter variables to find optimal conditions for maximum consumption in order to reduce the impact of PS on our ever decaying environment.

Poster 34:

Bacteriophage Isolation for Bacteria Pathogenic to Humans from Wastewater

Tyler Birk and Crosby Jones. Dept. of Biology, Angelo State University, San Angelo, TX.

Pathogenic bacteria have become increasingly resistant to antibiotics at an alarming rate and alternative methods for treating infections are being developed. One such treatment involves using bacteriophages to destroy the bacteria. The purpose of my project was to see if there was a correlation between the number of phages found in waste water compared to common bacterial hosts found as microflora on different parts of the human body. I used *Escherichia coli* (intestinal colonizer) as the baseline because I already knew that bacteriophages could be reliably isolated for it. I also tested *Salmonella typhimurium* (intestinal colonizer), *Serratia marcescens* (intestinal colonizer), *Staphylococcus aureus* (skin colonizer), *Staphylococcus epidermidis* (skin colonizer), and *Streptococcus mutans* (oral colonizer). San Angelo waste water was used as the potential source of the viruses and I employed standard phage isolation techniques. I have preliminary data on each of the bacteria and, once I gather a reasonable amount of results, I will analyze the information for notable trends. I hypothesize that areas of the body that are more likely to release bacteria into the waste water system will support more plaques for those host bacteria residing in that part of the body.

2017 South Central Regional Business Meeting Agenda

1. Call to order – Parliamentarian, Melissa Penton (Psi Delta)
2. Welcome from South Central Regional President Ashley Watson (Delta Sigma)
 - A. Welcome delegates
 - B. Officer Introductions
 - i. President, Ashley Powers – Delta Sigma chapter (SWOSU)
 - ii. Secretary, Annie Kwok – Beta Tau (Baylor)
 - iii. Parliamentarian, Melissa Penton – Psi Delta (ECU)
 - C. One Vote Per Chapter
3. Roll Call of Chapters – Secretary, Annie Kwok (Psi Delta)
4. Vote to Approve 2016 Minutes
5. Report from District Director I: Dr. Charlie Biles – Psi Delta (ECU)
6. Report from District Director II: Dr. Ali Azghani – Kappa Xi (UT Tyler)
7. Report from Regional Vice President: Dr. Adam Ryburn – Alpha (OK City Univ.)
8. New Business
 - A. Motion 2017-1: Motion to change regional convention selection and planning process (attached)
 - B. Motion 2017-2: Motion to establish formal regional officer responsibilities and election process (attached)
 - C. Selection of host chapter for 2018 South Central Regional Convention
 - D. Selection of co-host chapter for 2018 South Central Regional Convention
 - E. Choose a date and venue for 2018 South Central Regional Convention (if needed)
 - F. Election of regional student officers
 - G. Other new business
9. Announcements
10. Closing Remarks by Regional President Ashley Watson (Delta Sigma)

Adjournment

Motion 2017-1: Motion to change regional convention selection and planning procedures

1. A host and co-host chapter for the next year's regional convention will be elected each year during the annual business meeting.
2. In consultation with the Regional (faculty) Vice President and District Directors, the host and co-host chapters will select a date for the next regional convention. (Historically regional conventions have been held between the last weekend of March to the third weekend of April. Every attempt should be made to keep the convention date within this window.)
3. In consultation with the Regional (faculty) Vice President and District Directors, the host and co-host chapters will select a venue for the next regional convention. When considering venues, please note there should be enough space for lodging of approx. 175-200 individuals, space for oral and poster presentations, dining and/or catering options, space for business meeting and awards ceremony (approx. 175-200 capacity), and handicap accessibility.
4. Date and venue of the next regional convention should be decided and announced to the Region by June 1 of each year.

Motion 2017-2: Motion to establish formal regional officer responsibilities and election procedure

Alpha Chapter moves to establish a formal process by which regional student officers are elected and a detailed description of officer responsibilities. We propose the following criteria:

1. The student officers of the South Central Region of Beta Beta Beta shall be a **President**, **Vice-President**, and **Secretary**; collectively referred to as the Executive Board. The Executive Board shall also include the faculty leadership of the region—Regional (faculty) VP and District Directors.
2. The regional student **President** shall preside at the annual regional business meeting (held in conjunction with the regional convention) and preside at any meeting of the Executive Board. The President shall also coordinate with the regional convention host and co-host chapters for the purpose of opening the annual regional convention. The President shall be a regular member of Beta Beta Beta.
3. The regional student **Vice-President** shall preside in the absence of the President, shall fulfill any special duties delegated by the President or Executive Board, and shall become President if that office becomes vacant.
4. The regional student **Secretary** shall keep the minutes of the annual regional business meeting and the meetings of the Executive Board. Within 7 days of each meeting, the Secretary shall publish the minutes by sending a copy to Regional (faculty) Vice President to post on the Region's website.
5. Officers shall be elected annually at the regional business meeting, with President, Vice-President, and Secretary being elected in subsequent order. All voting should be done via secret ballot.
6. Newly elected officers shall take office at the conclusion of the annual regional business meeting during which they were elected.

Minutes for 2016 Tri Beta South Central District Regional Convention

1. Call to Order – 2016 Regional Parliamentarian Paige Harrelson (Omicron Kappa)
2. Welcome from 2016 Regional President Uriel Minjares (Epsilon Sigma)
 - i. Welcome Delegates
 - ii. Officer Introductions
 1. President, Uriel Minjares (Epsilon Sigma)
 2. Secretary, Ashley Powers (Delta Sigma)
 3. Parliamentarian, Paige Harrelson (Omicron Kappa)
 - iii. One Vote Per Chapter
3. Roll Call of Chapters – 2016 Secretary Ashley Powers (Delta Sigma)

Chapters present: Alpha, Beta Tau, Delta Lambda, Delta Phi, Delta Sigma, Delta Tau, Epsilon Sigma, Iota Omicron, Kappi Xi, Mu Kappa, Nu Eta, Omicron Kappa, Pi Alpha, Psi Delta, Psi Mu, Sigma Theta
4. 2015 Business Meeting Minutes Approved
5. Committee Reports – none
6. Report from District Director I: Dr. Terry Cluck (East Central Oklahoma State)
7. Report from District Director II: Dr. Ali Azghani (UT Tyler)
8. New Business
 - a. Date for next regional convention
March 31st - April 2nd chosen
 - b. Location of next year's meeting
Motion made to remain at Mt Lebanon - passed
Host chapter to ensure ADA compliance
 - c. Selection of 2017 Host Chapter
Epsilon Sigma – Angelo State
 - d. Selection of 2017 Co-host Chapter
Sigma Theta – Texas Wesleyan University
 - e. Election of 2016-2017 Regional President
Ashley Powers - Delta Sigma (SWOSU)
 - f. Election of 2016-2017 Regional Secretary
Annie Kwok - Beta Tau (Baylor)
 - g. Election of 2016-2017 Regional Parliamentarian
Melissa Penton – Psi Delta (East Central)
9. Announcements
10. Closing Remarks Regional President Uriel Minjares (Epsilon Sigma)
11. Adjournment



Mt Lebanon Campus Map

1701 Texas Plume Rd. • Cedar Hill, TX 75104 • 972.291.7156 • www.mtlebanoncamp.com



FACILITIES

- FS** Chuala Group Fire Site
- C** Chuala Shack
- DBU** DBU Hospitality House
- DH** Dining Hall
- GL** Grande Lodge
- HC** Health Center
- LSR** Lone Star Room
- O** Office
- PC** Patton Chapel
- REC** Rec Pavillon
- RR** Restroom
- RC** Retreat Center
- TXH** Texas Hall
- WC** Worship Center

LODGES

- CD** Cedar Lodge
- CH** Chinaberry Lodge
- CW** Cottonwood Lodge
- E** Evergreen Lodge
- GM** Gladys Moore Lodge
- HB** Hackberry Lodge
- H** Hickory Lodge
- L** Live Oak Lodge
- M** Maple Lodge
- MK** Millie Kohn Lodge
- O** Oakwood Lodge
- PC** Pecan Lodge
- R** Redwood Lodge
- S** Sycamore Lodge
- W** Walnut Lodge

SPORTS

- Basketball (1,4-6)
- Sports Fields (1-5)
- Volleyball (1-6)
- Beach Volleyball (1&2)
- Archery Range
- BB Range
- Rifle Range

CABIN & BUNKHOUSES

- Bunkhouses (1-9)
- Cabin (1)

CHALLENGE COURSES

- Low Ropes Course
- Trail Course
- Zip Tower
- Climbing Tower
- Alpine Tower
- Power Pole

MAP KEY

- paved roads
- gravel roads



BETA BETA BETA

South Central Region



ARKANSAS

Kappa Rho - Arkadelphia
 Delta Nu - Arkadelphia
 Nu Eta - Clarksville
 Mu Omega - Conway
 Omicron Omega - Fort Smith
 Psi Gamma - Magnolia

LOUISIANA

Nu Gamma - Monroe
 Delta Theta - Natchitoches
 Nu Delta Nu - Shreveport
 Nu Iota - Shreveport

OKLAHOMA

Psi Delta - Ada
 Omicron Phi - Bethany
 Psi Iota - Chickasha
 Psi Mu - Edmond
 Psi Eta - Lawton
 Alpha - Oklahoma City
 Delta Beta - Shawnee
 Nu Lambda - Stillwater
 Mu Kappa - Tulsa
 Pi Alpha - Tulsa
 Delta Sigma - Weatherford

TEXAS

Delta Psi - Abilene
 Pi Beta - Abilene
 Epsilon Omega - Alpine
 Nu Epsilon - Arlington
 Kappa Upsilon - Austin
 Delta Omicron - Beaumont
 Mu Eta Beta - Belton
 Delta Chi - Brownwood
 Delta Xi - Canyon
 Epsilon Epsilon - College Station
 Delta Gamma - Commerce
 Epsilon Phi - Corpus Christi
 Omicron Kappa - Dallas
 Delta Epsilon - Denton
 Delta Zeta - Denton
 Nu Omega - Edinburg
 ‡ Sigma Theta - Ft. Worth
 Delta Delta - Galveston
 Delta Alpha - Georgetown
 Delta Phi - Hawkins
 Iota Omicron - Houston
 Sigma Chi Club - Houston
 Delta Upsilon - Houston

Nu Delta Alpha - Houston
 Nu Beta - Houston
 Delta Tau - Huntsville
 Epsilon Tau - Irving
 Nu Delta Beta - Kerrville
 Nu Delta - Kingsville
 Nu Kappa - Laredo
 Nu Alpha - Lubbock
 Delta Lambda - Nacogdoches
 Sigma Chi - Prairie View
 * Epsilon Sigma - San Angelo
 Delta Pi - San Antonio
 Delta Pi Club - San Antonio
 Epsilon Rho - San Antonio
 Nu Chi - San Antonio
 Kappa Zeta - San Marcos
 Epsilon Psi - Seguin
 Delta Rho - Sherman
 Sigma Delta - Stephenville
 Kappa Xi - Tyler
 Nu Gamma Nu - Victoria
 Beta Tau - Waco
 Delta Mu - Wichita Falls

* Host Chapter ‡ Co-Host Chapter

