

**The Twenty-Third Annual**



**April 19, 2016**  
**Memorial Student Union Ballroom**  
**12:00 - 3:00 p.m.**

**Twenty-Third Annual  
SWOSU Research and Scholarly Activity Fair  
Tuesday, April 19, 2016**

**Welcome to the Twenty-Third SWOSU Research and Scholarly Activity Fair!** On display today are **117** presentations involving **187** student researchers, writers, presenters, and artists, and **45** faculty sponsors encompassing scholarly activity from the SWOSU School of Nursing and the SWOSU Departments of Art, Communication, and Theatre; Biological Sciences; Business & Computer Science; Chemistry and Physics; Education; Engineering Technology; Language and Literature; Music; Pharmaceutical Sciences; Psychology; and Social Sciences. In addition, there are poster presentations from the Western Technology Center Biomedical Academy.

I wish to extend my personal thanks to all who played a part in making this event happen, particularly: President Randy Beutler and Provost James South, for their support of research and scholarly activity at all levels throughout the University; Dr. Yolanda Carr, Director of the Office of Sponsored Programs (OSP), for spearheading the organization of this event, and the phenomenal assistance of Kem Mendizabal (OSP); Mr. Robert Barnes and his staff for setting up our facilities and providing refreshments; and, last but certainly not least, the members of the University Research and Scholarly Activity Committee for their dedication and hard work to make this event a reality.

Most of all, *congratulations* to all faculty, staff, and administrative sponsors who dedicate significant time and effort toward integrating students into various forms of research and scholarly activity. Student research is an essential ingredient in undergraduate education. It fosters independent, critical, and creative thinking skills, plus it provides the unique opportunity to apply knowledge and skills accumulated in the classroom toward problem solving in the real world. And, from the student's perspective, there is the added excitement of potentially being the first to make a discovery, understand a problem, provide a solution, and/or make a creative contribution to the world.

So, please take the time to visit both the poster displays and oral presentations this afternoon – I can guarantee you will learn something new. Plus, you just might meet the next Steve Jobs, Louis Pasteur, Florence Nightingale, Marie Curie, or Virginia Woolf.

Sincerely,



Dr. Lisa Appeddu, Chair  
University Research and Scholarly Activity Committee (URSAC)

**Committee Members**

Dr. Randy Barnett	Dr. Rickey Cothran	Mr. Ed Klein
Dr. Becky Bruce	Dr. Denise Landrum-Geyer	Ms. Erin Ridgeway
Dr. Yolanda Carr	Dr. Trisha Wald	Ms. Kim Zachary
Gwen Burgess	Davie Owen	

## Poster Presentations

*Please Note: The following presentations will begin at 12:30pm within the Student Union. Students on odd numbered panels are asked to be available in front of their posters from 12:30-1:30pm; students on even numbered panels are asked to be available in front of their posters from 1:30-2:30pm.*

1. **Motivational Quick-Start Guide to NASA Data and Supercomputing.** Michael Tucker (Dr. Jeremy Evert) SWOSU Department of Business & Computer Science

Objective: To get high school students and teachers motivated and excited about how supercomputing works, from entry level hardware to using a supercomputer for scientific research. Thesis: Oklahoma high school students will benefit from training in High Performance Computing (HPC). Many schools provide access to what would have been considered a supercomputer only 20-30 years ago. Many organizations have provided a growing number of resources for students interested in programming. But many of these opportunities do not focus on learning how to program for what is next. This gap can be filled by a motivational quick-start to NASA Data and Supercomputing Use. Methodology: This research follows and documents the work of several SWOSU Undergraduate students involved in NASA research on various supercomputing platforms, ranging in cost from a few hundred dollars up to a few million dollars. This work will be cataloged as a quick-start guide, which will be distributed to partners at area high schools for evaluation. This document will provide future high schoolers an experience that will leave a lasting impression enabling them to realize they are part of a bigger picture in regards to unlocking the mysteries of our universe. Summary: The students and supercomputers of today are the leading researchers and smart phones of tomorrow. This research is an exciting bridge to motivate students by demonstrating that programmers and supercomputing comes in all shapes and sizes.

2. **Understanding Fluid Power.** Cristhian Casillas, Derek Inman, and Jordan Sage (Mrs. Cindi Albrightson) SWOSU Department of Engineering Technology

My team and I were required to reconstruct three lab kits, one hydraulic and two pneumatics, using parts from existing lab kits that have been used in the past. Each individual member had to come up with a lab project for his/her lab kit assigned. In this presentation, we will introduce both the pneumatic and hydraulics system explain how they work on a poster and have one working lab to demonstrate it.

3. **New Math Strategies in the Elementary Classroom.** Jessica Egner, Shawna Meyer, Tammy Morgan, and Katie Ramming (Dr. Sherri Brogdon) SWOSU Department of Education

Students will present new math strategies and technologies used for teaching elementary mathematics as seen at the National Council for Teaching Mathematics meeting.

4. **China's Spring Festival.** Yixiao Yuan and Jiji Lu (Ms. Tee Kesnan and Dr. Fred Alsberg) SWOSU Department of Language & Literature

Xi Ru once stated that amid the western culture merging into the Chinese society, globalization, and China's market economy, the Chinese community in the People's Republic of China strives to prevent the erosion of culture. In their poster presentation, Yi Xiao and Jiji will present their findings on how the traditional Spring Festival takes agricultural culture as a basis and how this festival is set according to the lunar calendar instead of the solar calendar. Most importantly, the significance of the century old annual Spring Festival will also be discussed.

- 5. A Research Comparing & Contrasting SWOSU and the University of Taipei, Taiwan.** Zheng Yi-ru (Ms. Tee Kesnan and Dr. Fred Alsberg) SWOSU Department of Language & Literature

In her presentation, Yi-ru Zheng will present her research on comparing and contrasting SWOSU and University of Taipei in terms of university policies, the types of services available, teaching and learning methods, and so on.

- 6. Observation Project: Comparing and Contrasting the Trinity Baptist Church in Weatherford, OK, and Longshan Temple in Taipei City, Taiwan.** Pei-Yu Kao (Ms. Tee Kesnan and Dr. Fred Alsberg) SWOSU Department of Language & Literature

This research looks at two places of worship: The Baptist Church in Weatherford, OK and Longshan Temple in Taipei City, Taiwan. Some of the topics that the presenter will highlight are the environment and the ambience, the unique architectures, and the types of worshippers who visit the church or temple.

- 7. A Compare and Contrast Study on Midfirst Bank in Weatherford, OK, and NongHyup Bank in Seoul, South Korea.** Jiyoung Kim (Ms. Tee Kesnan and Dr. Fred Alsberg) SWOSU Department of Language & Literature

Based on her recent research observation project, Jiyoung Kim will discuss a compare and contrast topic which involves two different banks: the MidFirst Bank in Weatherford, OK, and NongHyup bank in Seoul, South Korea. In her presentation, Jiyoung will address the types of banking basics and services, the architecture and the ambience in both the banks, the logo of each bank, and the types of services provided by the respective banks.

- 8. The Gyeongbokgung Palace: The Royal Palace of the Joseon Dynasty.** Haerim Jeong (Ms. Tee Kesnan and Dr. Fred Alsberg) SWOSU Department of Language & Literature

The purpose of Haerim Jeong's study is to introduce to the audience the main royal palace of the Joseon dynasty called the Gyeongbokgung Palace. In her presentation, Haerim will address the history of the palace, the architectural principles of ancient Korea, the interesting layout of the palace, and the different buildings on the palace grounds.

- 9. A Compare and Contrast Study on the Himalayas and the Andes.** Abdulaziz Alsuliman Nasser (Ms. Tee Kesnan and Dr. Fred Alsberg) SWOSU Department of Language & Literature

The purpose of Abdulaziz's research is to present a compare and contrast study about the Himalayas and the Andes. A keen mountaineer who had tracked and climbed the Himalayas and the Andes, Abdulaziz will share his research findings on the respective locations of the Himalayas and the Andes, the formation of the Himalayas and the Andes, the respective elevations and the highest points, and who and what lives there.

- 10. A Compare and Contrast Study on Oklahoma's Official State Meal and Taiwan's Number One Street Food.** Li Chi Chiu (Ms. Tee Kesnan and Dr. Fred Alsberg) SWOSU Department of Language & Literature

As an exchange student and a die-hard foodie from Taiwan, the presenter will report her research on the similarities and differences between the chicken fried steak and a Taiwanese version of breaded chicken called "Ji-pai." The presenter will also discuss the layers of flavors, textures, methods of preparations, and the interesting history behind each of these recipes.

- 11. Whole Foods or Vitamins?** Nhu Tranh Uyen and Quynh Nguyen (Ms. Tee Kesnan and Dr. Fred Alsberg) SWOSU Department of Language & Literature

Is it better to get the natural vitamins and minerals from whole foods or to get synthetic vitamins manufactured in a lab? As a student majoring in nursing at SWOSU, Tranh and Nguyen will explore the reasons why Americans are spending more than \$17 billion a year on supplements instead of whole foods. The presenters will also address whether the consumption of supplements has helped make a significant difference in controlling the rates of chronic diseases.

- 12. Life in the Hive: Journey to the Center of the Bee Hive.** Samson Asongwe (Ms. Tee Kesnan and Dr. Fred Alsberg) SWOSU Department of Language & Literature

In his presentation titled "Life in the Hive: Journey to the Center of a Bee Hive", Samson will share his research findings by providing vivid details and explaining what the inside of the bee hive is like and what life is like for honey bees.

- 13. The World's Scariest Airport.** Ang Chuten Sherpa and Aditi Shrestha (Ms. Tee Kesnan and Dr. Fred Alsberg) SWOSU Department of Language & Literature

In this presentation, Ang Chuten Sherpa and Aditi Shrestha will discuss about their research findings on the most dangerous and scariest airport in the world, the Lukla Airport in Nepal. The presenters will also address the history of the airport, how it was built, and the facilities available.

- 14. The Planet's Last True Frontier.** Taiwo Momoh Oladipopo and Oluwaseyi Oluwabamise Titilayo (Ms. Tee Kesnan and Dr. Fred Alsberg) SWOSU Department of Language & Literature

This research completed by Taiwo Momoh and Oluwaseyi Oluwabamise will explore the very deepest place on earth, also known as the "planet's last true frontier," The Mariana Trench. The presenters will provide insights into what and where it is located, the formation, the geology, just how deep the Marian Trench is, and the unexpected life found in the ocean's deepest trench.

- 15. How Do Sharks Hunt?** Abdulaala–Ahmed Al Muhsan (Ms. Tee Kesnan and Dr. Fred Alsberg) SWOSU Department of Language & Literature

Based on his study over how sharks hunt, the presenter will discuss his study about one of the oldest underwater creatures on earth. The presenter will also discuss about what researchers have discovered and how different shark species utilize and switch between the various senses as they hunt and capture their prey.

- 16. The Origin of the Number Zero.** Desi Pratush Reddy and Dhruv D. Patel (Ms. Tee Kesnan and Dr. Fred Alsberg) SWOSU Department of Language & Literature

This research provides new insights into who invented the number "0" (zero) and how. The presenters, Pratush and Dhruv will unpack the etymology, the history, symbols and other representations of the number 0, and the different concepts of "0" used as a number as well as a numerical digit in certain parts of the world.

- 17. The One-Year Mission in Space.** Andikan John Usanga (Ms. Tee Kesnan and Dr. Fred Alsberg) SWOSU Department of Language & Literature

In his poster presentation, Andikan Usanga will unpack interesting information about NASA's recent record-setting one-year mission in space. Apart from that, he will also discuss the effects of space on the body and mind right down to the cellular level.

18. **Project New on Yard.** Hazem Alshahrani (Ms. Tee Kesnan and Dr. Fred Alsberg) SWOSU Department of Language & Literature

When asked to carry out an observation study at an unusual place in Oklahoma, Hazem stumbled upon an auto salvage pull-a-part junk yard in Oklahoma City, Oklahoma. In his presentation, Hazem, will present his brand new discovery, the pull-a-apart auction/disposal theories, useful tips and tricks, the history, the inventory, the location, the pricing, the type of customers, the necessary apparel, BYOT (Bring Your Own Tools), and the fancy free "V.I.P. Do It Yourself" Club Card.

19. **SWOSU Capstone Terex Team.** Enrique Chaparro, Kyle Hall, and Jacob Wall (Mr. Brad Bryant) SWOSU Department of Engineering Technology

SWOSU Engineering Technology Capstone class, is a course that allow seniors to work on a project from a manufacturing company around western Oklahoma. This course gives students hands on experience on how manufacturing plants work and the type of problems they can encounter. Our team is made of three seniors which got to work with Terex Corporation in Oklahoma City that specialize in aerial work platforms. Our project was to develop a solution to help improve the safety of an operator while he/she works in the shaft installation process of a telehandler. During the course of the year, we made several visits to Terex to analyze the process we were going to be working with in order to understand in detail how the process worked, as well as how the operator went about the shaft installation. After hard work and a lot of meetings between the team we developed a tool cart with an articulating arm that will assist the operator in lifting a 30 pound drive shaft and make it faster, but most importantly, safer to install. We also added a pair of industrial magnets that can also help the operator hold the shaft overhead safely.

20. **MARS.** Dillon Heskett, Margaret Musser, and Garrett Gresham (Mr. Brad Fitzgerald) SWOSU Department of Engineering Technology

Our goal for the MARS over pack project was to analyze their process and determine approximately how much dog food they are giving away each year. We were also tasked to improve the process so they aren't wasting dog food.

21. **Superior Fabrication Inc. Furnace Door Redesign.** Cole File, Tyler Williams, and Alexander Scarborough (Mr. Nathan Brooks) Department of Engineering Technology

The purpose of this project is to redesign Superior Fabrication Inc.'s annealing furnace door to meet or exceed the upcoming safety audit in May of 2016. Throughout the project we have incorporated safety features and functionality into the design in order to provide a safe and long-lasting piece of equipment to be implemented into the annealing furnace operation. The new design will eliminate overhead hazard by replacing the elevated sliding door with a dual set of hinged doors repositioned on the sides of the frame.

22. **Dental Diets That Promote Feline Oral Health.** Braye Riseley (Ms. Danna Goss) Western Technology Center Biomedical Academy

Oral health is just as important in felines as in humans. As more varieties of cat foods are emerging, new steps to increase oral pet health are being taken. Studies have proven that bad oral health leads to the deterioration of organ systems and ultimately organ failure. Overtime oral bacteria will turn into plaque and tartar and eventually resulting in gingivitis, periodontitis and possible infection. With this new information, pet owners are considering how to promote oral health and prevent these side effects in their pets. So just how clean is a cat's mouth, and what are some ways to lower the oral bacteria levels? In this project, the comparison between Veterinary Oral Health Council approved and non-approved dry cat foods on oral bacteria was tested to determine which food was more effective in decreasing levels of oral bacteria. The myth that canned food promotes lower levels of bacteria than dry cat food was tested using a more

expensive, veterinary recommended canned food and a cheaper, non-recommended canned food and comparing the levels of bacteria. During this four week research trial, ten outside cats varying in breeds were used as test subjects. Two trials of dry cat food each consisting of a one week period, and two trials of canned cat food each consisting of one week were conducted. After being fed a specific food for a week and swabbed at the end of the week, petri dishes with Luria Broth Agar were streaked to measure oral bacteria growth. LB Agar was used because it is a non-specific medium that allows bacteria to grow. These petri dishes were incubated at 30°C for two days. The bacteria growth was counted, recorded, and later analyzed. The results of this experiment could affect the food pet owners buy and improve overall feline oral health.

**23. Color and Taste Perception.** Michaela Robertson (Ms. Danna Goss) Western Technology Center Biomedical Academy

With picky eating becoming more common among both children and adults, people have made many attempts to bypass this irrational behavior in order to improve health through ones diet. With this behavior in mind, it brings to question the reasoning behind picky eating. How an item of food is transferred in to a perceivable taste is through taste buds in the mouth which are then sent to the brain. Once the taste buds send the signal to the brain the olfactory bulbs located in the frontal lobe of the brain then interpenetrate the chemical compounds in the food into a perceivable taste. In order to determine a rational reasoning behind this trend a simulation of picky eating was created using Kool Aid and food coloring. Accompanied by food coloring, the following Kool Aid flavors were used: Pink Lemonade, Orange, Blue Raspberry Lemonade, Green Apple, and Cherry. On each of the five days, one of the flavors was selected and half of the gallon of Kool Aid was left unaltered while the other half was altered using food coloring. Participants then drank 1.5 Oz of each and immediately rated them on a scale of one through five on how sweet or bitter they perceived the taste to be. The finding of this experiment should show a distinct difference between the flavor rankings of color altered and unaltered Kool Aid, therefore there is a correlation between color and taste perception.

**24. Melatonin Aiding in Weight Loss.** Emily Wright (Ms. Danna Goss) Western Technology Center Biomedical Academy

Nearly 78 million adults and 13 million children in the United States alone deal with the effects of obesity everyday. With the obesity epidemic on the rise people's eyes have been opened to the harm it causes the human body. The new trend has shifted gears toward living a healthier lifestyle, being more active, and being more comfortable in your own skin. However, weight loss can be an intimidating and endearing task, but what if there was an alternative to easier and less time consuming weight loss? In this research project, melatonin was used in attempt to aid in weight loss. In all, twelve mice were used in the experimental trial. Six mice were put in the first habitat and six mice were put in the second habitat. Each habitat included a large cage with a thick layer of pine bedding, a food bowl, a water bottle, sticks to chew on, and shredded t-shirts to ensure their warmth. The first group was the control group and the second group was the melatonin-tested. Every evening the melatonin-tested mice were given the recommended human dosage of melatonin for each mouse. The melatonin was crushed into a powder form and dissolved in two sevenths an ounce of water. The combination of water and melatonin was then added to their water. Both habitats were given exactly one third a cup of Sun Seed Vita Rat, Mouse, & Gerbil Formula food every day. On every Sunday over the four week trial, the mice were weighed. The data was then recorded and analyzed. The anticipated outcome is expected to aid in weight loss which then can assist people in fulfilling a healthier lifestyle.

- 25. Which is More Effective: Hand Sanitizer vs. Antibacterial Hand Soap.** Sierra Bowdre (Ms. Danna Goss) Western Technology Center Biomedical Academy

In almost every setting, the option to use hand sanitizer or antibacterial hand soap to disinfect your hands is available. The majority of people will often choose hand sanitizer because it is fast and easy. In this experiment, hand sanitizer was used to see if it is more effective than antibacterial hand soap. Soft-soap Antibacterial Soap was used for the antibacterial soap and Germ-X was used for testing hand sanitizer. Forty test subjects volunteered to be a part of the research project. Their hands were swabbed before testing began. After having their hands swabbed, they were randomly assigned to use either the hand sanitizer or the antibacterial hand soap trial. They used the products they were assigned, and had their hands swabbed again. The subjects who used hand sanitizer had two pumps of hand sanitizer and rubbed in until dry. The subjects who used the antibacterial soap had two pumps of the soap and washed their hands for two minutes and then patted dry. The samples were then placed in petri dishes with LB agar, and placed in an incubator at 35° C for 24 hours. Colonies were counted and recorded the next day. The data was later analyzed and recorded. This study will help determine if hand sanitizer truly is the best path to choose in order to disinfect your hands.

- 26. Total Body Health.** Ryan Boecker (Ms. Danna Goss) Western Technology Center Biomedical Academy

With fitness on the rise many workouts are being promoted as the best, however the question on everyone's mind is "How they compare to each other?" This research project's goal is to compare CrossFit and traditional weight training. To test this comparison, a non-bias total body fit test was used. The fit test includes push-ups, sit-ups, air squats, and a quarter mile sprint. The fit test is non bias because it not only test strength, but also conditioning. The two components are essential to the total health of the subjects. The two groups participate in a fit test at the beginning of the study. After one month of completing the work out, they take the second fit test. After the second month of working out the participants will take their final fit test. The progress will be tracked after each test, to chart the subject's growth in total body health. The studies outcome will determine which workout style is best for total body health.

- 27. Affects of Playing Video Games on Short Term Memory.** Kollin Elmore (Ms. Danna Goss) Western Technology Center Biomedical Academy

Playing video games is nothing out of the ordinary for many people around the world. Due large participation in gaming, many people question how it affects the brain. Using a series of two tests participants will be tested to determine if there is at least some effect of playing video games and the ability to retain information over a period of ten minutes. The two trials consist of four groups of people, four passages, and four tests. The participants will be divided by their age and type of game they will be playing. The testing will be in two phases. For phase one testing, the participants will be asked to read the assigned random passage. Once finished reading the passage, they will sit for ten minutes. Once the ten minutes has passed, the participant will take a test according to the passage read and their age group. Once finished with the test the participant will return in one week and be asked to read a similar random passage. Once finished reading the passage the participant will play their assigned video game for ten minutes. Once ten minutes has expired the participant will take a similar test based on passage read and age group and that score will be recorded. The scores recorded for each group will be statistically analyzed and shared with all participants at the conclusion of the project. This project's results will provide statistical answers that will show a correlation between gaming and genre of gaming in relation to the retention of information. Due to the fact that playing a video game keeps the brain active and thinking results may increase when a video game is played. Results will show that of the two genres strategy will further increase the scores when compared to casual gaming as the brain is more focused and processing more information at once.

**28. How Tap Water and Bottled Water Effects Plant Growth.** Karl Craig (Ms. Danna Goss) Western Technology Center Biomedical Academy

Which is healthier, tap water or bottled water? The effects of water on plants varies on the type of water that the plant ingests. Water contains varying elements depending on their composition. This depends on what kind of components it comes in contact with. Bottled water is sanitary and is used by most people for drinking water. The tap water is purified using elements. A total of 24 Morning Glory plants will be planted, there will be 4 plants per pot. This will provide accurate data collection. To ensure that the plants are in the same environment and not exposed to any outside harmful or beneficial elements. The plants will be kept in a room at a constant temperature. The plants will have the same soil composition and grown in a Miracle-Grow seed starting pot mix. The plants will be grown in 6 biodegradable Lawn and Garden seed starting pots. Inside the pots, the seed starting mix will be put in. To provide light to the plants, the pots will be placed under a Jump Start 4 foot lighting source. This comes with a fluorescent light to act as the sun. The pots of plants will need to be watered daily and given half an ounce of water. The plant is fast growing, and will sprout in moderate temperature. Since the plants will be kept indoors it will be in a constant environmental setting, which means the temperature, setting, and overall feel of the room will be marginally unchanged. Plant height will be measured in centimeters weekly. This is the data that will be analyzed and used to perform a t-test to determine if the data is statistically significant. While both water sources should allow the plants to grow, the findings should be that the bottled water will provide more nutrients to the plants than the tap water.

**29. "How Does Music Effect How We Perceive Things in Life?"** Laura Beeler (Ms. Danna Goss) Western Technology Center Biomedical Academy

Most people listen to some type of music every day. How someone perceives things and music can affect their mood. Views of the world and daily achievements can translates into emotions and reflects their mood. The music genres being tested are hip-hop/rap, country, pop, and rock. The brain is complex and data has proven a connection that translates music. The pace and beat within a song plays a factor in our perception and emotions. The hippocampal forms the emotions related to social attachments. Music therapy is an example of this. Doctors still do not understand why music therapy is such a success, but it allows doctors to focus on the frontal gyrus. This experiment will be conducted by having three group's ages being 13-14, 15-16, and 17-18 completing an initial survey. The subjects will then randomly select a genre of music with the options of rock, pop, rap, and country. Subjects will randomly pick a song from a ten-song file associated with that genre. The video test consist of many patterns that represent the distractions people see as they walk down the street. The subjects will watch the video for 5 minutes for each genre, while marking the faces they see on a spreadsheet. This research should prove that there is a difference between how people view expressions when listening to music. Music can help people have an outlet for their emotions whether it be sad, mad, or happy. The results of this project will hopefully discover is that by the subjects, listening to the happy music the sad and neutral faces will present themselves as happy faces; showing the visual effect music can have on people. This same affect will hopefully happen when the participants listen to sad music also.

**30. How sleep deprivation effects the brain.** Tiffany Barron (Ms. Danna Goss) Western Technology Center Biomedical Academy

Sleep deprivation effects not only the health of the heart and brain, but also causes infections and a weaker immune system, irritability reduced cognitive functions, decreased mental sharpness, lack of focus, blurred vision increase in pain numerous disease, including a certain type of cancer and physical features. In this experiment the subject were surveyed and divided into groups of three based on the amount of sleep they received. Subject will be tested once a week for five weeks. The reaction test will be performed using <http://www.humanbenchmark.com/tests/reactiontime>, changing the time on the reaction time so

they don't get to comfortable with the time lapse. The low frequency test (<https://www.youtube.com/watch?v=H-iCZEIJ8m0>) from one to twenty based on the how well they can hear. Subject will play two videos one with the highest frequencies ([https://www.youtube.com/watch?v=0Vpl\\_2DTQhY](https://www.youtube.com/watch?v=0Vpl_2DTQhY)) with the volume to one, and then play the second video and start it out with the volume of five. The volume will be increased in increments of five all the way to twenty hertz. In this experiment based on the subjects amount of sleep it will show that people who receive more sleep will have a high increase of hearing and better reaction time than the people who receive less sleep.

- 31. Successful University Student Athletes.** Klemson Lancaster and Emeche Wells (Dr. E.K. Jeong) SWOSU Department of Art, Communication and Theatre

This research project concerns the lives of student athletes, particularly the challenges of being students and athletes at the same time. Many athletes struggle with their academics due to the amount of hours their sports require them to put in. In this study we will collect quantitative and qualitative data from SWOSU student athletes from various sport teams through interviews and surveys. This study focuses on determining the special responsibilities and challenges facing student athletes, the special resources available to them, and other variables that could affect the completion student athletes' programs of study. Although this research is limited to SWOSU student athletes, the researchers hope that its generalizable knowledge can be useful for students, faculty, administrators, and staff to better understand and support the success of student athletes with both their sports and their studies during their university lives.

- 32. Social Exclusion in the Oklahoma Muslim Community.** Bryn Hull (Dr. Lisa Schroeder) SWOSU Department of Art, Communication, and Theatre

As media portrayal of Muslims in the United States and abroad grows increasingly negative, this study seeks to identify feelings of social exclusion in the Oklahoma Muslim community. Literature connects negative media portrayal and negative public opinion. Survey data investigates the relationship between categorical data and feelings of social exclusion.

- 33. SWOSU Traditional Students' Personal Finance Knowledge.** Ryan Schmid (Dr. Teri Allen) SWOSU Department of Business & Computer Science

A growing concern on college campus is the lack of personal financial knowledge gained while in college. Universities across the country are slowly adding a financial literacy General studies course. This research is to show if that would be needed at SWOSU. Students will be tested and surveyed over 3 general topics: credit, retirement planning, and personal financing. These three topics are important because knowledge in these areas important immediately after college. The results will compared major to major and also upperclassman (60< credit hours) to freshmen (<30 credit hours).

- 34. The Different Types of Serial Killers.** Jose Flores (Dr. Howard Kurtz) SWOSU Department of Social Sciences

I am going to present a poster on how to classify different types of serial killers, what makes them unique from one another, and I will also explain what a serial murder is.

- 35. Education to Prevent Counselor Impairment.** Kira Powell (Dr. Amy Barnett) SWOSU Department of Psychology

In an effort to address the goal of education of all counselors to prevent impairment as set forth by the American Counseling Association's Taskforce on Counselor Wellness and Impairment (ACA, 2003), the Oklahoma Counseling Association's Southwest Region organized a conference specifically related to counselor self-care in 2014 and 2015. The purpose of this study was to

evaluate conference attendee satisfaction and compare the two conferences related to the impairment prevention education provided in order to determine if the implemented changes from 2014-2015 led to higher rates of attendee satisfaction. To do this, an evaluation form was given to attendees to determine level of satisfaction with each conference. Changes were implemented at the 2015 conference based on suggestions and areas not receiving full satisfaction at the 2014 conference. Evaluation forms were again given to attendees to determine the level of satisfaction and to determine if there was an increase or decrease of satisfaction based on the implemented changes. An analysis of data variation to determine an increase, decrease, or lack of variance in data findings was performed; and the results indicated an increase across all areas of the conference, including the keynote presentation (+.19488) and four different areas of counselor self-care practices: music therapy (+.2575), yoga (+.1875), massage therapy (+.1888), and nutrition (+.4166). As evidenced by the results, it appears that attendee satisfaction increased based on the implemented changes between 2014 and 2015, while meeting one of the goals of the ACA's Taskforce on Counselor Wellness and Impairment.

- 36. Kingston Fossil Plant Slurry Spill.** Clay Walker and David Clinton (Mrs. Cindi Albrightson) SWOSU Department of Engineering Technology

The disaster that we decided to talk about for this project is the Kingston Fossil Plant Slurry Spill. We decided to write about this disaster because when the plant was first built it powered approximately 700,000 homes and burned 14,000 tons of coal a day, and this plant is a great example what could happen to any large plant if not aware of the environment hazards and conditions. The Kingston Fossil Plant was in Kingston, Tennessee. The plant was located on the Watts Bar Reservoir on the Tennessee River. This was the nation's largest coal ash spill in history.

- 37. Environmental Disaster in Picher, Oklahoma.** Talon Watkins and Luke Carpenter (Mrs. Cindi Albrightson) SWOSU Department of Engineering Technology

There was a time when Picher, Oklahoma, was a booming mining town. People from across the country were moving to Picher to earn their share of the profits that continued to come from under the ground in the form of lead and zinc alloys. During the boom, the mines yielded the majority of the lead used to produce bullets during World War I and World War II. In 1981, the area was declared the Tar Creek super fund site by the Environmental Protection Agency. The vast majority of the population stayed put in Picher until the discovery of dangerous amounts of lead in the water in 2006. The remaining residents became concerned when educators discovered that the children of Picher were suffering from learning disabilities that were believed to be directly related to the lead contamination. Studies found that the town was in imminent danger of collapsing into the 14,000 abandoned mine shafts that cover forty square miles in and around Picher. The US government offered the remaining residents \$55 a square foot to evacuate and relocate. In 2009, the Post Office and the Police Department closed and shortly after the city ceased operations as a municipality. In 1983 the EPA ranked Picher as the country's most hazardous Superfund site. The EPA began a remediation effort in 1996, spending more than one-hundred and fifty million dollars.

- 38. Shpack Landfill.** Madisyn Abbe and Tyler Henry (Mrs. Cindi Albrightson) SWOSU Department of Engineering Technology

The Shpack Landfill was utilized from 1946 until 1965. A wide variety of waste products were discarded into the landfill including inorganic chemicals, organic chemicals, and also radioactive waste. The Shpack Landfill is located within a wooded swamp and also close in proximity to many people. A three mile radius of the site has just around 40,000 people living in it. The radioactivity had found its way to the aquifer running below the marsh. The aquifer was the source of drinking water for the people living within the region. Prior to the cleanup of the Shpack Landfill, anyone who was on the site could have very easily been exposed to the contamination. The groundwater contained many toxic compounds, and a variety of metals were still detectable in the water. The surface water that was there was contaminated with radium and no longer safe to touch, let alone drink.

- 39. Three Mile Island Disaster.** Winston Brown and Brandon Wrobbels (Mrs. Cindi Albrightson) SWOSU Department of Engineering Technology

Nuclear power plants took on increased restrictions on radioactive waste material after the Three Mile Island accident in 1979. The DPRI (Electric Power Research Institute) underwent an in depth research program to investigate fission behavior in severe accident scenarios. The EPRI program included experiments to obtain fundamental data and the development of computer-based models. After the accident, many international organizations got involved in similar research programs. In the study it will show what happened on Three Mile Island and the new safety precautions that have revolutionized the new standards for nuclear power plants.

- 40. The Animas River.** Brookson Creason (Mrs. Cindi Albrightson) SWOSU Department of Engineering Technology

In August 2015, the Animas River in southern Colorado suffered a dramatic disaster. The river was forced to shut down due to more than 3,000,000 gallons of mine waste being released into the Cement Creek which is a tributary to the Animas River. The accident happened when an EPA contractor drilled into the side of the Gold King Mine. The spill not only affected the value of the river to the businesses in the area due to a loss in revenue from river rafting, kayaking and fishing, but also human and animal life. The EPA is taking full responsibility for the spill. Prior to this event, the EPA stated that they did know that there was a risk for a blowout of contaminated water at the mine. Later, an EPA employee in charge of the Gold King Mine wrote in an email to EPA officials saying, "that he personally knew the blockage could be holding back a lot of water and he believed that others knew as well." The rush of wastewater turned the waters of the Animas River a mustardy yellow color.

- 41. The Cuyahoga River Fire.** Mason Ware and Devin Wilson (Mrs. Cindi Albrightson) SWOSU Department of Engineering Technology

The Cuyahoga River Fire on June 22, 1969 in Cleveland, Ohio left a city in ruins after an oil slick caught fire due to all of the industrial pollution. This fire caused about \$100,000 dollars' worth of damage. Obviously the fire was a big deal, but what really gave this so event so much attention? After all, history tells us that the pictures you see of a ship engulfed in flames was actually from a previous fire and that there are no known documented pictures of the famous Cuyahoga River fire. This fire caught the attention of many and spurred on the attitude that began to change in the 1960's that would come to be known as environmentalism. This catastrophe opened the eyes of many people when it came to dumping industrial waste into rivers. This was only one of many fires that happened in the river; however, the Cuyahoga caught the attention of the world. The world cares about polluting the waters because this is the water that was a thriving eco system, transportation for many industrial goods, and the drinking water for the people. The main problem that needs to be solved with this eye-opening catastrophe is trying to stop or at least trying to regulate these different types of pollution before they get out of control, especially in this case when industrial waste had polluted a river bad enough to actually make it go up in flames. The final outcome of the Cuyahoga River Fire was a push towards what is known now as environmentalism. These are the people that push towards safer ways of disposing wastes, transporting wastes or chemicals, and protecting the people. This catastrophe put a huge push on making everything more environmental friendly, safer for the public, and safer for future generations.

- 42. The Exxon Valdez Oil Spill.** Tom Klade (Mrs. Cindi Albrightson) SWOSU Department of Engineering Technology

The Exxon Valdez oil spill was one of worst spills in history. On March 24, 1989, the oil tanker grounded on the Bligh Reef in Alaska's Prince William Sound . The hull burst open and spilled nearly 11 million gallons of crude oil into the water. At least 28 types of plants animals were impacted by the event. The captain of the Exxon Valdez tanker, Joseph Hazelwood, was reported to be under the influence of alcohol the night the accident took place. Hazelwood was the only one qualified to navigate the waters, but turned the helm over a fatigued and inexperienced crewmember. There was also some debate in how the cleanup process should have been handled. Some people believe that nature should have taken its course and the problem would fix itself with the violent storms of the Alaskan coast. The National Oceanic Atmospheric Administration studied in 1974 during the Amoco Cadiz disaster that spilled almost 68 million gallons in coast France. From this study, they found that the major impacts of that spill had disappeared. The most notable changes from the accident included the creation drug and alcohol testing programs for more dangerous positions, restricted dangerous work to employees with no history of substance abuse, and strengthened training programs for vessel captains and pilots. Exxon had set aside \$4.3 billion for the accident and reportedly compensated for more than 11,000 Alaskans within the year of the spill, however 32 thousand people were reportedly affected by the spill in the whole country and 20,000 of those people lived in Alaska. References [www.wholetruth.net](http://www.wholetruth.net) [corporate.exxon.com](http://corporate.exxon.com) - The Valdez Oil Spill [response.restoration.noaa.gov](http://response.restoration.noaa.gov) [ngm.nationalgeographic.com](http://ngm.nationalgeographic.com)

- 43. Flint Michigan Water Crisis.** Hunter Hollingsworth and Aeon Tanifum (Mrs. Cindi Albrightson) SWOSU Department of Engineering Technology

We are researching the Flint Michigan water crisis. The town of Flint switched their water supply to a new source in 2014, and they have had problems with lead ever since. We are doing this project to study the effects that the environment can make on our everyday life. What Flint is going through is a perfect example of this. In 2014 Flint Michigan had an idea to save money. They switched where they got the town's water supply from. They had previously got it from Lake Huron, but they were switching to the Flint River, which was a river that ran through the town and everyone knew it was dirty. Soon the water began to look brown and dirty as people would use it in their house. The water contained lead. It water was not treated correctly, so that resulted in the lead on the services lines in the homes making its way into the water. The people in the town of Flint were told that the water was fine, but with more research they found out that it definitely wasn't. This is a problem that couldn't be left alone, so officials began to work on it.

- 44. Football Field Lighting.** Ashlee Garza-Beitinger, Allyson Heskett, and Chesney Swartwood (Mr. Brad Fitzgerald) SWOSU Department of Engineering Technology

Our team will study, measure and analyze the existing lighting level of the SWOSU Football field then meet with the appropriate contractors to develop a plan to improve the field lighting using up-to-date technology.

- 45. And the Beat Goes On: The Generation Gap and the Beat Movement in the 1950s.** Victoria Stambaugh (Dr. Becky Bruce) SWOSU Department of Social Sciences

Youth rebellion in America is frequently compared to the hippie movement of the late 1960s. However, hippies did not invent the concept of rejecting society and its social traditions. Within this essay I discuss the Beat Generation, or Beat Movement. The Beatniks were a diverse group of writers, artists, musicians, and poets who broke the old barriers in their respective subjects and began a countercultural crusade that took place nearly two decades before the hippies. The 1950s were a time of prosperity and increasing affluence. With more time available to search for social and personal identity, college-aged individuals rejected traditional socialization, believing they should shift away from the cultural values of their parents' generation.

- 46. The U.S. Government and Propaganda: Shaping the American Children (1945-1955).** Jordan Lager (Dr. Becky Bruce) SWOSU Department of Social Sciences

After World War II, the relationship between the United States and the Soviet Union was extremely tense. Both the Soviet and American governments manipulated propaganda to make the opposing country's government appear unappealing within their nations. In this paper, I discuss the American government's use of propaganda, directed specifically towards American children, to spread the fear and hatred of communism. I explain the government's use of educational videos, cartoons, comic books, and even trading cards as a means of socializing American children with the mindset that communism was a fatal idea. The American government targeted children in order to implant them with the mentality that communism was a dangerous idea so that as the children grew, they would never succumb to such an un-American idea as communism.

- 47. A New Kind of Playground: Youth Involvement in the Civil Rights Movement.** Kyra Schmidt (Dr. Becky Bruce) SWOSU Department of Social Sciences

The Civil Rights Movement was a crucial event in United States history; however, history has ignored a significant group of participants. Youth, such as children and teens, were critical to many campaigns in the Civil Rights Movement, which, would not have been as successful, or happened at all, without their participation. This group was essential in public school integration, the sit-in movements in Oklahoma and Mississippi, the Birmingham Children's Crusade, Freedom Summer, and the march on Selma. These students were central to these campaigns because they were more available than their adult counterparts were since they did not have as many responsibilities. In addition, Americans reacted much differently to pictures of violence against children than they did to pictures of violence against adults. The public had grown somewhat used to seeing pictures of violence against black adults, but seeing pictures against the youth of the Civil Rights Movement stunned the nation and generated more support for the movement. Many times these adolescents and young adults faced opposition from all sides, extreme violence, and even the possibility of death, but never backed down from striving to accomplish what they believed was right. Although overlooked through the years, youth were vital to the success vital of the Civil Rights Movement.

- 48. Prosecutorial Misconduct.** Carla Salcido (Dr. Dan Brown) SWOSU Department of Social Sciences

This presentation will focus on prosecutorial misconduct and the ramifications it has on the court systems. The presentation will also cover the increasing media attention on prosecutorial misconduct in America and the actions taken by the federal, state, and local government officials. The amount of money wasted on new trials, inmate exonerations, and legal fees due to prosecutor misconduct will also be presented. In this presentation, Oklahoma, Texas, and Mississippi will be the states represented in the data.

- 49. "The Great Debate: Guns On College Campuses."** Dr. Dan Brown, SWOSU Department of Social Sciences

This presentation will examine the current political debate of whether guns should be allowed on college campuses in Oklahoma. The Oklahoma Legislature is considering proposed bills that would authorize individuals with conceal carry permits to bring guns onto college campuses. The presentation will examine the arguments for and against the proposed laws. The presentation will conclude with the impact of guns being allowed on Oklahoma college campuses.

- 50. George "Machine Gun" Kelly.** Ty Normand (Dr. Howard Kurtz) SWOSU Department of Social Sciences

In the poster I cover an analysis, history, criminal career, theories for behavior, how to stop deviance, and reducing this type of crime

- 51. Labeling Criminals.** Chelsey Griffith (Dr. Howard Kurtz) SWOSU Department of Social Sciences

In this presentation I will explain what labeling does to criminals, how it creates them, and how it affects the crime rate.

- 52. The Effectiveness of Applied Life Story Musical (ALSM) on the Executive Functions and Resilience of Residents in the Assisted Living Setting.** Shelby Baker, Didier Khoo, Yi-Wei Huang, and Caleb Zerby (Ms. Yu-Ling Chen) SWOSU Department of Music

This presentation will summarize a pilot study investigating the effectiveness of the Applied Life Story Musical (ALSM) intervention on the executive functions and resilience of residents in the assisted living settings. ALSM, as defined in this study, is a theatrical performance based of real life stories of the participants via song singing, chanting, instrument playing, dialogue, narrative, acting, and dance or movement. The creative process required by the production of musicals provides for opportunities of executive functions such as decision-making and problem solving. Expressing something new and meaningful to the participants also promotes resilience, the ability to bounce back despite the adversity. The presentation will include the theoretical framework of ALSM intervention, following the description of protocol with clinical examples, and then conclude with the findings of this pilot study.

- 53. A Comparative Study on Music Therapy Techniques For Addressing the Articulation of Spoken Language in English and Mandarin Chinese--A Literature Analysis.** Tzu-Chi Lin (Dr. ChihChen Sophia Lee) SWOSU Department of Music

The effectiveness and efficiency of music therapy techniques on speech development or rehabilitation have been proven by many music therapy researches. American Speech-Language-Hearing Association has listed out the speech disorders that could happen to an adult, included apraxia, dysarthria, and stuttering; and for children, there are childhood apraxia of speech, dysarthria, orofacial myofunctional disorders, speech sound disorders, and also stuttering. These are not only the fact in America, but in other language culture.

- 54. The Effectiveness of a Multi-Phase Music Therapy Protocol on the Pulmonary Function of Severe Asthma Patients.** Didier Khoo (Dr. ChihChen Sophia Lee) SWOSU Department of Music

The purpose of this study aims to investigate the effectiveness of incorporating a multi-phase framework that involves playing various wind instruments and utilizing breathing and relaxation techniques on the pulmonary function and lung capacity in severe asthma patients. Severe asthma can be defined as 'continued asthma symptoms, frequent worsening of asthma symptoms, and asthma attacks among patients who take multiple asthma medicines with a high degree of compliance and good trigger management. Additionally, severe asthma is the experience of patients who are not necessarily therapy resistant, but whose asthma is difficult to control and manage and requires a different level of care than milder versions.' The techniques used in this research aim to help manage asthma exacerbations completely. Current research suggests that proper relaxation techniques and breathing techniques are required to produce a clear tone on a wind instrument, and these techniques may not only help increase pulmonary functions and lung capacities, but also carry the potentials to be transferred to real-life situations when an asthma exacerbation occurs. Playing on wind instruments that are specially selected to fit a multi-phase framework would serve as a motivator to develop those techniques and prevent the effects of asthma exacerbations.

- 55. To Disclose or Not to Disclose: Music Therapists and their Sexual Orientation.** Stephanie Bates (Dr. ChihChen Sophia Lee) SWOSU Department of Music

The presentation will discuss the different challenges faced by Music Therapists who are a part of the Lesbians, Gays, Bisexuals, Transgendered, and Questioning community, such as their experiences and how they approached this situation, the pros and cons of disclosing your sexual orientation to your clients and their families. The presenter will also set up a plan as to what to say to the clients and families and whether it is appropriate or not to share this information.

- 56. Exploring the use of Music Therapy in the Treatment of Sexual Dysfunctions.** Mark Williams (Dr. ChihChen Sophia Lee) SWOSU Department of Music

Sexual dysfunctions are common amongst many individuals and couples. Those who do seek assistance usually find that their symptoms are not simply physical, but often rooted in psychosocial origins, and solidified in relational conflicts. If music therapy is known to be effective in addressing mental and social needs, could it have a place in the alleviation of such symptoms and dysfunctions? Literature research and interviews with professionals in the psychological and sex therapy fields give an understanding of to what extent Music Therapists can assist in the treatment of the sexual dysfunctions of their clients.

- 57. A Current Analysis of Melodic Intonation Therapy Modifications for specific populations.** Shelby Baker (Dr. ChihChen Sophia Lee) SWOSU Department of Music

The Presentation will consist of a comparison of various Melodic Intonation Therapy Techniques and a description of the populations. Examples of the survey, results, analysis of results, and other documents related to the topic will be presented, followed by a time in which the presenter will answer questions.

- 58. How Music Therapy Techniques Can Be Used More Efficiently in Psychiatric Music Therapy Within a Realm of Keeping One's Reality.** Ali Richards (Dr. ChihChen Sophia Lee) SWOSU Department of Music

I will conduct a Descriptive Literature Review researching different kinds of Music Therapy techniques on those suffering from schizophrenia. I will be looking goals and objectives set by the Music Therapist that focus on the client's realistic view of self and surroundings, working on skills in dealing with emotion, and growing in knowledge of ways to avoid social withdrawal. The purpose of using goals and techniques such as these are to bring clients back into reality and give them tools to do so in the future, to have increased amounts of confidence/healthier identity, to have improved organization of thought, decrease amounts of depression, increase adaptation skills, to have less rigidity to inconsistency, to provide coping skills for hallucinations, increased emotionalism, empowerment, development of communication and social skills, self management of illness, decrease positive and negative symptoms, and overall increased quality of life. Within this Literature Review I will be looking for the correlation between music therapy applications and different symptoms of the clients, determining the effectiveness of a specific treatment to a specific symptom or diagnosis. I will be comparing the different findings of many studies, looking for factors that could affect the efficiency of successful treatment. I will be looking for how therapists assess the reality orientation of the client and look at the results of any reassessment of that throughout treatment. The purpose of this Literature Review is to assess whether all different factors have been explored and to spark thought for further experimental research to find the most successful Music Therapy treatment for individuals suffering from Schizophrenia. Mental health care is simple in a world mixed up in so much complication and confusion. These people are in obvious need and I have a responsibility to them and anyone affected by this heart wrenching disease and would like to work towards finding an outlet of treatment that works.

- 59. The Importance of Music in Education.** Morgan Corona (Dr. Denise Landrum-Geyer) SWOSU Department of Language & Literature

Music has a larger impact on people than what most people realize. Participating in music activities and listening to music can affect how students learn in the classroom, and music is a factor in brain development, which is important when the students are younger. This presentation will cover these facts and address the importance of music in education.

**60. Gun Control: Now or Never?** Alina Shrestha (Dr. Denise Landrum-Geyer) SWOSU Department of Language & Literature

In today's age, where one stands depends on how well one can present and defend oneself; surely and certainly the right to bear arms is a complicated issue. The issue of gun control does not come alone. It is inseparably entangled with the issue of gun violence, or should we say it follows gun violence. The more the incidents of gun violence, the greater the pressure on the context of gun control, and the laws and regulations associated with it. In recent decades, the events associated with gun violence and gun crime have spread in America like a wave, the ripples of which are far reaching and far resonating. The main purpose of this research study is neither to reach a conclusion nor to take sides, but to present the information and findings and views gathered from various sources regarding the possible solutions and approaches to gun control, and present a personal take on the viable options concerning the issue of gun control.

**61. Gender Roles, Gender Identity, and Other Social Constructs.** Lily Schwemley (Dr. Denise Landrum-Geyer) SWOSU Department of Language & Literature

This presentation will examine the ways in which gender roles influence children, what this influence means going into adulthood, how Christianity perpetuates these gender roles, and what it means to be nonbinary in a gendered society. The purpose for this presentation is to educate people on what gender roles are really doing to children and talk about a community that is very underrepresented: the nonbinary community.

**62. Influence of Depression on Academic Achievement.** Gwendolyn Burgess (Dr. Randy Barnett) SWOSU Department of Psychology

Background: Adolescents with low self-esteem have been found to have a greater risk for low success in school and higher risks for poor academic outcomes. Self-efficacy, however, has been found to be a better predictor of academic achievement. Juvenile delinquents (JD) are often have lower levels of emotional regulation and this has been shown in several studies. Students who were depressed were far more likely to have a lower self-reported GPA or to have had a bigger decline in GPA. Method: Participants consisted of 147 JD males between 13 and 18 years of age in an out-of-home placement facility. All residents were administered a battery of assessments including the CDI and the WRAT at admission and upon exit of the facility. The CDI has five subscales (Anhedonia, Negative Self-Esteem, Ineffectiveness, Interpersonal Problems, and Negative Mood). The WRAT examines math, reading, and spelling. Results: It was hypothesized that the pre-test CDI scores would be predicative of the post-test scores. In a multiple regression analysis, each of the CDI 5 subscales was a significant unique predictor; together they explained 71% of the post-test CDI score. The interpersonal skills subscale explained 24% of the variance. It was hypothesized that depression score would be predictive of the academic scores. A multiple regression analysis showed that the WRAT pretest and age of participant explained 54% of the variance in the WRAT post-test score. An additional 12.6% was explained by the CDI variables. Negative mood and anhedonia post scores were significant unique predictors. It was hypothesized that the negative self-esteem CDI measure would be correlated with academic scores but the correlations were not significant. Further analyses examining other academic outcomes will be presented. Discussion: Self-esteem has been shown to be less predicative of academic outcome than self-efficacy. The relationship needs to be further explored in this sample. This could be due to several factors such as lower average academic scores among JD and a higher likelihood of an emotional disturbance among JD populations.

**63. The Influence of Anxiety on Changes in Academic Achievement for Delinquent Youth.** Gwendolyn Burgess (Dr. Randy Barnett) SWOSU Department of Psychology

Problem: Various lines of research suggest that juvenile delinquents may experience elevated levels of anxiety. There is a great deal of literature indicating that elevated levels of anxiety have a negative impact on academic achievement. Since academic achievement deficits are highly associated with juvenile delinquency and often considered a major target of treatment, this study focused on their relationship with anxiety in a residential treatment setting. Method: Participants consisted of 94 juvenile delinquent males between 13 and 18 years of age, within a residential facility. Upon arrival, all residents were administered the Multidimensional Anxiety Scale for Children (MASC), and the Wide Range Achievement Test (WRAT), which provides scores for Reading, Spelling, and Arithmetic. Scores were obtained upon arrival to the facility and immediately prior to discharge in order to obtain pre and post assessment scores. A multiple regression analysis was performed utilizing SPSS 22.0 to explore the relationships between the various subscales of anxiety within the MASC and academic improvements. Results: It was hypothesized that anxiety scores would be predictive of changes in academic scores. Results indicate that the regression model explained 65.6% of the variance in post-test reading scores, 25.7% of the variance in post-test spelling scores, and 54.2% of the variance in post-test arithmetic scores with only the respective pre-test scores being a significant unique predictor. When academic achievement pretest scores were controlled for, the MASC subscales did not add significant unique variance. Conclusion / Implications: While this study did not find the anxiety subscales assessed within MASC to be significant predictors of improvements in academic achievement for this population, it is important to note that potentially elevated levels of anxiety within this population may decrease the range of anxiety levels needed to fully recognize its influence on academic achievement. Future research is needed to further explore these relationships within this population.

**64. MARVELous sex role stereotypes: A content analysis of Marvel movies.** Emily Burgess and Mary Hertzell (Dr. Melinda Burgess) SWOSU Department of Psychology

Introduction: While superhero films have been examined for their violent content, and identification with the characters, there has been little systematic work examining sex role stereotypes in their portrayals of male and female characters. Given that video games and music videos are rife with stereotypes, we chose to examine superhero films as another genre popular with young adults and teens. We examined movie trailers because they are constructed to contain what the producers see as the highlights of the films. They are also readily accessible to the general public through previews in movie theaters and websites like IMDB. Methods: Two undergraduate research assistants coded the trailers for all 36 MARVEL movies released since 2000, after practicing the codebook on 5 action movies released in the same time period. When the average agreement reached acceptable levels on the variables ( $\kappa > .75$ ), they coded the superhero movies. Variables coded are discussed in the results due to word limits. Results: Male characters were nearly 3x more frequent than female characters ( $\chi^2(1, N = 192) = 39.42, p < .01$ ). Male characters were more likely to have their name said ( $\chi^2(1, N = 192) = 8.053, p < .01$ ; Cramer's  $V = .205$ ). Males were more likely to be portrayed more powerful than the females ( $\chi^2(1, N = 192) = 19.584, p < .01$ ; Cramer's  $V = .319$ ). Female characters were more likely to be portrayed as sex objects, ( $\chi^2(1, N = 192) = 5.441, p < .01$ ; Cramer's  $V = .168$ ), but this happened relatively rarely overall (3.8% vs. 0%). Female characters were also more likely to be scantily clad (15.4%), but males never were scantily clad ( $\chi^2(1, N = 64) = 21.4, p < .01$ ). Females were also more likely to be role objectified (17.3% vs. 2.14%;  $\chi^2(1, N = 192) = 14.882, p < .01$ ). Within their respective sexes, males and females were equally likely to be portrayed as heroes, but women were less likely to be heroes overall, ( $\chi^2(1, N = 192) = 22.475, p < .01$ ). Males were overwhelmingly the villains in our sample (25 of 27 villains;  $\chi^2(1, N = 192) = 6.159, p < .05$ ). Females were also less likely to be portrayed with a weapon ( $\chi^2(1, N = 192) = 4.149, p < .05$ ). Discussion: Although the Marvel films

definitely contained their share of sex role stereotypes with nearly three times as many male characters as females, an unequal distribution of both power and weapons favoring the males, and a greater likelihood of objectification and sexualization of the female characters, the portrayals were not as stereotyped as those in video games. Future research should examine how these characters are perceived by viewers and what impact these portrayals have on viewers' attitudes and behaviors.

**65. College women's social media use and prioritizing of academic and fitness goals.** Mary Hertzell (Dr. Melinda Burgess) SWOSU Department of Psychology

Introduction: First we investigated how a sample of college women spent time on studying and exercise, and second, we investigated whether social media use was related to their distribution of time. Previous research has demonstrated that the media is filled with unrealistic images of women's bodies to which young women compare themselves and experience distress when they fall short in these comparisons. Additionally, media is ever more accessible today than it has been. With the advent of smart phones social media apps, these media images are now delivered into the hands of young women around the clock. Given that the prevailing portrayal of women in media emphasizes physical attractiveness as being of paramount importance, do young women devote more time to exercise than to studying? Methods: 132 women (average age = 20.01,  $s_{age} = 4.16$ ) from a medium sized university in the southwestern United States completed a series of questionnaires asking the amount of time they spent each day engaged in exercise, studying, and using various social media platforms (Facebook, Pinterest, Snapchat, Instagram, Twitter and Tumblr). They also completed the Perceived Instrumentality and Academics Scale (Miller, DeBacker & Greene, 1999) and the Motives for Physical Activities Measures - Revised (MPAM-R) (Ryan, Frederick, Lepes, Rubio, & Sheldon, 1997). Results: Social media use varied dramatically from 0-2400 minutes per day with an average of 239.7 minutes per day ( $s = 335.1$  min). Pinterest was the most frequently used ( $M = 66.8$  min,  $s = 108.4$ ), and Twitter the least frequently used ( $M = 12.9$  min,  $s = 43.4$  min). The range for the amount of study was quite broad (0-2580 min/wk,  $M = 678.4$  min/wk,  $s = 469.5$ ), as it was for exercise time (0-4200 min/wk,  $M = 527.1$  min/wk,  $s = 623.6$  min/wk). When comparing how many people in the sample met the recommended guidelines for exercise (30 min per day, 4 times per week) to the recommended study guidelines (2 hours outside of class for every hour in class; this would be 1440 min/wk for a 12 hour course load), we found that the women were far more likely to meet the exercise guidelines (77.1%) than the study guidelines (7.8%). There was not a relationship between the amount of social media time spent daily and the amount of time spent studying relative to the amount of time spent exercising ( $r_{socialmediause \times study/exerciseratio} = -.098$ ,  $p > .05$ ). However, high exercisers (over 540 min/wk) spent significantly more time ( $M_{HighExercise} = 345.56$  min/wk,  $s_{HighExercise} = 471.13$  min/wk) using social media than the low exercisers (under 210 min/wk),  $F(2, 121) = 3.506$ ,  $p < .05$ , ( $M_{LowExercise} = 149.12$  min/wk,  $s_{LowExercise} = 147.43$  min/wk). Discussion: 77.1% of the women exercised the recommended time per week while only 7.8% of the women studied the recommended time. This is the most interesting finding, suggesting that perhaps women do recognize the increased value society emphasizes on their bodies over their minds, and as such are much more diligent in taking care of their physical selves.

**66. Is video game playing related to perceptions of aggression?** Aaron Cornell (Dr. Melinda Burgess) SWOSU Department of Psychology

Introduction: Video games, particularly those rated M (Mature) have been found to contain some of the most racist imagery in modern American media (e.g., Burgess, Dill, Stermer, Burgess & Brown, 2011); additionally, the 'bad' buy in M games is more likely to be Black or Middle Eastern (Dill, Gentile, Richter, & Dill, 2005). Additionally, Black male faces that are more stereotypic in appearance are perceived to be more aggressive (Blair, Judd, & Chapleau, 2004). This is effect is so pronounced that defendants with more stereotypic features receive harsher sentences in legal

settings up to and including more death sentences (Eberhardt, Davies, Purdie-Vaughns & Johnson, 2006). With these two things in mind we investigated whether video game playing would be related to people's judgements of Black and Middle Eastern male faces. Methods: 71 students, 52 F and 19 M (average age = 19.1,  $s = 1.4$ ) viewed 36 faces (12 each of White males, Black males and Middle Eastern males); they saw each face for 5 seconds and then had 15 seconds to complete their ratings. They rated each face on a 10 point scale (0 = not at all to 9 = extremely) for how intelligent, compassionate, threatening, arrogant, motivated, friendly, likable, and aggressive they thought the person was. Following the images they completed the Violent Video Game Questionnaire (Anderson & Dill, 2000). Results: There were clear cut difference in how the students rated the photos (see below), but these differences were not related to video game playing which was our primary hypothesis. There was not a significant correlation between the type of game played (rated Everyone (E), Teen (T) or M),  $r_s < 0.1$ ,  $p_s > 0.4$ , nor did people who preferred M games differ in their ratings as compared to those who did not play M games ( $p_s > .05$ ). In fact, the trend was consistently in the opposite direction. Both Black and White men were rated as more compassionate than Middle Eastern men,  $F(2, 58) = 16.298$ ,  $p < .01$ . Both Black and Middle Eastern men were rated as more threatening than White men,  $F(2, 51) = 24.19$ ,  $p < .01$ . Both Black and White men were rated as more friendly than Middle Eastern men,  $F(2, 41) = 14.77$ ,  $p < .01$ . Both Black and Middle Eastern men were rated as more aggressive than White men,  $F(2, 58) = 16.298$ ,  $p < .01$ . Discussion: The primary hypothesis, that game play (particularly M games) would be related to ratings of aggression and threat in the Black and Middle Eastern men was not supported. There were, however, several issues with the sample that might be related to this. First, there simply were not enough people in the sample who reported playing M games and most of our subjects were women who don't tend to play these games. Secondly, the weekend before data collection Paris was attacked by ISIS which could have altered the ratings in ways that are unclear.

**67. Career Decision Self-Efficacy and Career Barriers: How are the Components Related?** Maci Glasscock, Aileen Aiello, Morgan Bressman, and Ashton Neely (Dr. Jared Edwards) SWOSU Department of Psychology

For this study, the Career Barriers Inventory-Revised (CBI-R; Swanson, 1991) and the Career Decision Self-Efficacy Scale-Short Form (CDSE-SF; Betz & Klein, 1996; Betz, Hammond, & Multon, 2005) scales were correlated to examine the relationship between their instruments and the underlying factors. The CBI-R (Swanson, 1991) measures perception of barriers to career development (these may be external or internal and real or perceived) on 13 different sub scales (sex discrimination, lack of confidence, multiple role conflict, conflict between children and career demands, racial discrimination, inadequate preparation, disapproval by significant others, decision-making difficulties, dissatisfaction with career, discouraged from choosing non-traditional careers, disability/health concerns, job market constraints, and difficulties with networking/socialization) based on 70 items scored on a 7-point likert scale. The CDSE-SF (Betz & Klein, 1996; Betz, Hammond, & Multon, 2005) measures confidence in making a career decision on 5 sub scales (self-appraisal, occupational information, goal selection, planning, and problem solving) from 25 5-point likert scale items. Because both instruments measure components of the career development process, we wanted to explore the relationships among their different subscales.

**68. Presenting Information About White Privilege and Systemic Racism: Message vs. Messenger.** Aileen Aiello, Maci Glasscock, and Catherine Schubert (Dr. Jared Edwards) SWOSU Department of Psychology

As Americans, we are nearly constantly presented with information regarding racial and gender driven disadvantages. With inspiration from Battle, Hill, and Zorwick (SWPA 2015) and motivated by the cross-racial violence capturing the attention of the media of late, we found it important to examine how that information is perceived by the audience. We wanted to know if our collective perception regarding this information is changed when the presenter's race, gender, or nationality changes.

**69. Career Barriers Inventory-Revised Assessment: Are scores consistent across two administration formats?** Morgan Bressman and Ashton Neely (Dr. Jared Edwards) SWOSU Department of Psychology

For this study we examined the relationship between a paper format and a computer (Microsoft Excel) administered format of the Career Barriers Inventory-Revised (Swanson, 1991). The CBI-R is a 70 item, likert scale instrument that yields 13 subscales and a full scale score. A computer administered format allows for quicker administration, quicker scoring, and less chance of error in the transcription/scoring process. It allows for immediate feedback instead of the delayed feedback from using a paper format of the instrument. We wanted statistical evidence that a computer administered format was equivalent to the paper format. This study uses the same methodology as Bressman, Edwards, Aiello, & Bivins (2015).

**70. The Association between Adolescent Physical Activity and Parental Relationships.** Kendra Hess (Dr. Kristin Woods) SWOSU Department of Psychology

The importance of health and physical fitness is a concern among Americans adolescents. Parents who model physical activity (PA) and show avid support for PA overall positively influences adolescent participation in the interest in PA (Martin, Ewing, & Gould, 2014). Adolescents in the mid-1990's were more PA and healthier, therefore, the current study aimed to determine if the current associations between adolescent PA and relationship with parents is found in adolescents during the mid-1990's as it is today. A secondary analysis of publically available data from the National Longitudinal Study of Adolescent Health was conducted, which used a school-based, clustered sampling design to identify a nationally representative sample of 9th to 12th-grade students, with oversampling of underrepresented groups. The sample of 4,366 adolescents was comprised of 49 % male and predominately Caucasian (57%). Chi-square analyses showed a statistically significant association between sport activity involvement and closeness to their mother  $\chi^2=22.83$ , 4 df,  $p=0.0001$ ; weekly exercise and a satisfactory relationship with their father  $\chi^2=20.56$ , 4 df,  $p=0.0004$ ; and active minutes in physical education class and closeness to their father  $\chi^2=20.19$ , 4 df,  $p=0.0005$ . Overall, the findings are consistent with the data in that PA and parental relationships are related for adolescents in the mid-1990's. The decline in adolescent health and PA over the years could be related to a decline in their parents PA during their own adolescence, therefore, resulting in not modeling PA as parents. If this is the case, one would expect to see less modeling of PA by parents to continue and a decline in adolescent physical health and fitness for generations to come without intervention. Self-esteem aids in participation of PA and overall connection to parental figures (Atkins et al., 2013). This implies that stronger family relationships, in general, will be effective to aid adolescent involvement in greater movement and physically related activities on a daily basis; thus, promoting a healthier generation for ages to come.

**71. Working mothers: Do their children feel loved and wanted?** Rachel Yarnell (Dr. Kristin Woods) SWOSU Department of Psychology

Previous research by Milkie, Nomaguchi, and Denny (2015) found that the amount of time adolescents have with their mother did not relate to behaviors, emotions, or academics, but did for social status factors. The aim of the current research was to better understand if the feelings of adolescents during the mid-1990s related to maternal time unlike current adolescents' emotions and the role of social status factors. A secondary analysis of publically available data from the National Longitudinal Study of Adolescent Health was conducted, which used a school-based, clustered sampling design to identify a nationally representative sample of 7th- to 12th-grade, with oversampling of underrepresented groups. The sample of 6,228 adolescents was comprised of

51.91 % female and 57.51 % Caucasian. The relationship between number of hours the mother works outside the home and if they feel loved and wanted by their mother was statistically significant  $F(4, 5880) = 2.52, p = .04$ . Whether the mother worked part-time, full-time, or over-time each week, the majority of participants strongly agreed or agreed to feeling loved and wanted by their mother. The relationship between how much education the mother and father had and feeling loved and wanted by their mother was statistically significant  $F(7, 5675) = 5.54, p < .0001$ . The relationships between if either parent received public assistance and the mother working outside of the home with feeling loved and wanted by their mother were both non-significant. The results suggest that the less time spent working by the mother and having a higher level of education is associated with the adolescent feeling loved and wanted by their mother. Employed mothers may adopt various strategies to manage conflicts so that their parental role is not adversely affected by working. For example, mobilizing the support of the other parent and relatives and use of good time management skills. One could conclude that it is not the amount of time the mother spends with the adolescent, but whether the adolescent has quality time with their mother and if other forms of support are in place.

**72. Parental Relationships, and Family and Peer Suicidal Behaviors by Adolescent Suicide Attempts.** Kristi Burghardt (Dr. Kristin Woods) SWOSU Department of Psychology

Adolescent suicidal behavior is an important subject, in fact; every two hours and three minutes a youth commits suicide (King, Strunk, & Sorter, 2011). Students who self-harm or attempt suicide often show higher levels of depression, lower levels of self-esteem, and generally feel they are not supported by parental figures (Brausch & Gutierrez, 2010). The goal of this research was to examine the association between parent, peer, and family relationships and suicidal behaviors in adolescents during the mid-1990's to determine if previous trends are consistent with current research findings. A secondary analysis of publically available data from the National Longitudinal Study of Adolescent Health was conducted, which used a school-based, clustered sampling design to identify a nationally representative sample of 7th- to 12th-grade students, with oversampling of underrepresented groups. The sample consisted of 821 participants that had seriously considered suicide in the past twelve months with 63.09 % females and predominately Caucasian (60.57%). The results showed that when adolescents perceive their parents as caring about them, they attempt suicide less frequently or not at all  $F(4, 810) = 3.70, p = 0.0054$ . If an adolescent had a friend commit suicide though, they were more likely to attempt suicide themselves  $F(2, 814) = 6.14, p = 0.0023$ . When the adolescent had a family member commit suicide, they were more likely to attempt suicide  $F(2, 814) = 7.35, p = 0.0007$ . The results of this study are consistent with previous research; suggesting that parent, family, and friend relationships have played and continue to play a large role in adolescent lives across generations and cultures. It is important for society as a whole, parents of adolescents, and the field of psychology to be aware that even though society is ever changing, suicidal behaviors and factors that relate to it during adolescence, shows no change from the mid 1990's to now. Adolescents are influenceable people, and in the wrong circumstances and conditions, may make a very fatal decision that could ultimately end their life.

**73. Pupation height differences in field collected and laboratory fruit flies (*Drosophila melanogaster*).** Jessica Huffman (Dr. Jimena Aracena) SWOSU Department of Biological Sciences

Fruit flies, *Drosophila melanogaster*, show variation in their pupation height. Some pupate very low in the walls of their vials, while others pupate higher. Our purpose was to record the pupation height and number of pupae in two different strains of flies (lab flies and field-collected flies) in order to see if there was genetic variation. For each strain, we placed five male and five female flies in vials lined on the inside with transparency paper. The flies were allowed to lay eggs for 24 hours and then they were removed. Nine days later, we recorded the number of pupae and their

location on the wall of the vial. The lab flies produced more offspring that reached pupation stage than the field flies. We recorded the number of pupae above and below a 3.5 cm mark from the media surface. Both strains of flies pupated significantly more below the 3.5 cm mark. The higher number of pupae produced by the lab flies shows that they may be more adapted to living in laboratory conditions. The fact that both strains pupated significantly more often in the lower half of the vial could be related to energy conservation when climbing to pupate. This effect may also depend on density. A higher density may cause the larvae to climb higher to avoid the other larvae.

**74. Patch location preference during foraging in fruit flies (*Drosophila Melanogaster*).** Courtney Gunning (Dr. Jimena Aracena) SWOSU Department of Biological Sciences

Fruit flies (*Drosophila melanogaster*) have a particular foraging behavior on patches, which depends on food quality and their physiological state. The purpose of my experiment was to determine the preference of feeding position for the flies on a small patch of food. Specifically, we were interested in testing their preference for feeding on the side, middle, or corners of a dish. Groups of fifty flies were allowed to feed on a patch of wells filled with sucrose solution for ninety minutes. They were filmed from above to record their location on the patch. We analyzed the recordings in five-minute increments and noted that the number of flies on the patch increased over time. We concluded that the flies have a significant preference for feeding on the sides and the corners of the patch. One of the possible explanations for this behavior is thigmotaxis during foraging behavior on the patch.

**75. Cost of Courtship: Effects of Male-Male Competition on Harm Experienced by Females in *Hyalella Amphipods*.** Ashna Dhoonmoon (Dr. Rickey Cothran) SWOSU Department of Biological Sciences

Sexual conflict over mating is common because males and females often have clashing interests over whether, when, how often and for how long to mate. This may result in significant costs to females, which can have negative consequences on populations. We hypothesized that females are more harassed and thus harmed in more densely populated areas. We also hypothesized that females would be harassed more in populations with male-biased sex ratios. In *Hyalella* amphipods, there is sexual conflict over the duration of pre-copulatory mate guarding. Males prefer to pair for a longer period than females. We set up populations of amphipods that differed in the relative proportion of the two sexes: 20% male (female biased), 40% male (typical sex ratio in nature), or 60% male (male biased). Separately, we also varied the size of the container to manipulate amphipod density. We predicted that female survival would decrease as the percentage of males and the density of the population increased. Female survival was ~65% lower in male-biased populations compared to female-biased populations. Contrary to our predictions, females survived better at the higher of the two densities. As number of females in a population decreases, the population has less genetic diversity and hence a greater risk of local extinction. It can be concluded that sexual conflict has a negative effect on population health.

**76. Pick Your Poison: Sublethal Effects of Pesticides on Amphipod Life History, Physiology and Behavior.** Lindsey Hendricks (Dr. Rickey Cothran) SWOSU Department of Biological Sciences

Understanding the sublethal effects of pesticides is critical because most pesticides are found in low concentrations in nature. Sublethal effects (i.e. effects that do harm to organisms, but do not kill them) have been understudied. I am exploring the sublethal effects of malathion on life history traits of *Hyalella* amphipods. Amphipods collected from two populations in western Oklahoma will be exposed to one of three concentrations of malathion: a no malathion control (0 µg/L), a relatively low sublethal concentration (0.005 µg/L), and a relatively high sublethal concentration (0.02 µg/L). Amphipods that have just reached maturity will be chosen for the experiment and

monitored for the entirety of their adult lifespan. For both sexes, I will measure growth rate. For each female, I will also record the number of offspring produced over her lifetime to measure lifetime reproductive success. For males, I will also measure the growth of the posterior gnathopod (a claw-like appendage), which is a sexually selected trait. I predict that the amphipods in the high concentration treatment will have slower growth rates, lower lifetime reproductive success, and smaller claws than those exposed to lower concentrations of malathion. If malathion negatively affects amphipod life history traits, there may be problems in the community they live in because they play important roles as grazers, detritivores, and prey in freshwater ecosystems.

**77. The importance of non-consumptive effects of predatory dragonfly larva on sexual conflict: can predators scare amphipods and affect sexual conflict?** Reine Sinthia Youmbi Yamdjeu (Dr. Rickey Cothran) SWOSU Department of Biological Sciences

Sexual conflict is a situation where one sex negatively affects the fitness of the other sex. It has been proposed that the environment (e.g. predators, food availability, and competition) can affect the intensity sexual conflict; however, this area of ecology has not received much attention. Predation can significantly affect sexual conflict by changing the behavior of individuals as they avoid being detected by predators. The presence of predators may cause females to be more or less resistant to mating, thus increasing or decreasing sexual conflict. We studied the effects of dragonfly predators on sexual conflict over precopulatory mate guarding (PCMG) duration in amphipods (*Hyalella* sp.). Females prefer shorter PCMG durations than males. We will test how the presence of predators affects sexual conflict in amphipods by exposing small populations to one of two treatments; with predator cues or without. The number of encounters between the sexes and the number of PCMG pairs will be recorded. If predator cues cause a decrease in amphipod activity, sexual conflict will decrease because females will receive less harassment from males (i.e. we will observe fewer PCMG pairs). However, dragonflies may increase the "value" of PCMG to females because pairs are less likely to be eaten by dragonflies than single individuals. In this case, we might expect longer PCMG durations. Results will provide insights into how ecology affects the outcome of sexual conflict.

**78. The Microflora Inhabiting Gastrointestinal Tracts of Freshwater Amphipods in the Genus *Hyalella*.** Sarah Dengler, Carlene Kinder, Ashna Dhoonmoon, and Lindsey Hendricks (Dr. Denis Trubitsyn and Dr. Rickey Cothran) SWOSU Department of Biological Sciences

The feeding ecology of small, benthic aquatic invertebrates is notoriously difficult to study. Many of these organisms are crustaceans, a clade that is known to contain many omnivorous, opportunistic foragers. We hypothesize that the microflora of gastrointestinal tracts will provide insights into the diets of these difficult to study organisms. Specifically, this project will compare the microflora in the gastrointestinal tracts of *Hyalella* sp. amphipods grown in different resource environments. The identification of microorganisms will be performed by isolating the genomic DNA from the contents of amphipods' gastrointestinal tracts followed by polymerase chain reaction amplification of the bacterial 16S rRNA regions. Once amplified, the DNA fragments will be subjected to sequencing. The bioinformatic analysis will be used to identify the abundance of microbial species that make up the *Hyalella* sp microflora. Our results will provide valuable information on the power of this approach to explore the feeding ecology of benthic, aquatic invertebrates.

**79. Use of Species Specific Interferons in Veterinary Medicine.** Jaci Peetoom (Dr. Denis Trubitsyn) SWOSU Department of Biological Sciences

Interferons are cytokines, a type of signaling proteins involved in immune response that are released by affected cells in situations such as the invasion of viruses, bacteria, or parasites. Currently, human recombinant interferons are used in veterinary medicine to treat various conditions in animals; however, interferons are species specific and human interferon based drugs

require higher dosages administered to animals to achieve remission. The purpose of this study is to determine how well species specific interferon medication works in improving health of domestic animals suffering from various conditions. Pharmaceutical substances based on recombinant bovine, swine, canine, equine interferons with or without an antibiotic will be administered to animals suffering from low immune response levels, viral and bacterial infections, stress, etc. In order to collect data for analysis veterinarians will examine the condition of animals subjected to study followed by completion of a questionnaire by animal owners. The use of species specific interferons will be analyzed to test the prediction that these pharmaceutical substances are more beneficial when compared to human interferon that are currently administered.

- 80. Construction of an Efficient Expression System for Functional Analysis of the Magnetosome Protein Mad2 From *Desulfovibrio magneticus* RS-1.** Brady Burke, Mazie Earl, Sarah Dengler, and Carlene Kinder (Dr. Denis Trubitsyn) SWOSU Department of Biological Sciences

Magnetotactic bacteria (MTB) is a diverse group of prokaryotic organisms which produce magnetosomes, intracellular magnetic nanocrystals surrounded by a lipid membrane. MTB navigate layers of aquatic sediments by orienting themselves with the Earth's magnetic fields using chains of magnetosomes similar to a compass needle. The goal of this study is to investigate the role of the magnetosome protein Mad2 from *Desulfovibrio magneticus* strain RS-1 in crystal morphology by expressing it in *Escherichia coli* followed by analysis of its iron binding properties and effect on crystal formation in vitro. Previously, we established that high levels of Mad2 are toxic to *E. coli*. This project's specific aim is to remove toxicity of Mad2 and isolate it in amounts sufficient for further analysis. A glutathione S-transferase (GST) gene will be amplified and cloned upstream of mad2 on the expression vector. We hypothesize that constructed GST-Mad2 fusion should have less toxic effect due to decreased affinity for the *E. coli* cytoplasmic membrane as well as increase solubility of the overexpressed protein. The GST tag can later be used for protein purification, and will be removed with a protease to allow investigation of the function of the native form of Mad2. This project will improve our understanding of the process of magnetosome formation, and will help to overcome difficulties in commercial production of magnetosomes which have many biotechnological and biomedical applications.

- 81. Evaluating the Mechanism of Induced Resistance by *Pseudomonas putida* Against *Pseudomonas syringae* Infection.** Rukayat Idris (Dr. Regina McGrane) SWOSU Department of Biological Sciences

As demand for agricultural produce increases, methods for increasing yield are necessary. The project objective is to determine if the rhizosphere bacteria *Pseudomonas putida* can induce resistance in common bean plants to infection by the bacterial-plant pathogen *Pseudomonas syringae*. This project also seeks to evaluate the mechanisms of induced resistance in the model plant, *Arabidopsis*1. We hypothesize *P. putida* may induce resistance in a variety of important crops susceptible to *P. syringae* infection. To evaluate the ability of *P. putida* to induce resistance in common bean plants, we compared *P. syringae* populations and disease symptoms in plants grown in the presence or absence of *P. putida*. Previous work shows *P. putida* initiates the salicylic acid defense pathway in *Arabidopsis*1. We hypothesize NahG, a salicylic acid hydroxylase, may function in induced resistance. To test our hypothesis, we are constructing *P. putida* mutants lacking or overexpressing nahG. Splice-overlap deletion mutagenesis is used to construct deletion mutants, while over-expression constructs will control nahG expression with a constitutive, high activity promoter. Constructs will be compared in ability to induce resistance to *P. syringae* infection in *Arabidopsis*. If *P. putida* is able to induce resistance to infection in a variety of crops, it could be used as a plant health promoting inoculant; understanding its mechanisms will make large scale applications in agricultural settings a viable option.

**82. Autophagy and BEC-1 play an important role in maintaining a healthy nervous system.**

Ashley Powers (Dr. Andrea Holgado) SWOSU Department of Biological Sciences

Autophagy is a degradative process that enables cells to survive stress from nutrient deprivation, accumulation of damaged organelles, and pathogen invasion. In healthy cells, autophagy removes damaged proteins and organelles to prevent cell damage. In starving cells, autophagy digests intracellular molecules to provide the valuable nutrients cells need. Furthermore, dysfunctional autophagy, on the other hand, is implicated in aging, and many diseases such as cancer, neurodegenerative diseases, muscular disorders, diabetes, and obesity. Thus, understanding the underpinnings of autophagy in health and disease is an active area of today's research. Herein, we present our findings on the role of autophagy in the nervous system of *Caenorhabditis elegans* nematodes. To study the role of autophagy in neurons, we manipulated autophagy by reducing the levels of BEC-1, a protein shown to induce autophagy in eukaryotes from yeast to humans. In brief, BEC-1 expression in GABAergic motor neurons was blocked posttranscriptionally using tissue specific dsRNA knockdown strategies. Synchronous nematodes strain XE1375 were fed with bacteria containing an empty vector (control) or a vector possessing sequences for the expression of the *bec-1* dsRNA (experimental). During development, GABAergic motor neurons of nematodes from strain XE 1375 were exposed to the inhibitory effects of the *bec-1* dsRNA and results were recorded at various stages. Analyses of animals fed with bacteria expressing the *bec-1* dsRNA show postembryonic developmental and functional defects at the level of motor neurons. Imaging studies with epifluorescent microscopy revealed a reduction in the number of VD motor neurons with an average count of 17 of the original 19 motor neurons. Quantification of motor function showed a statistically significant decrease in motility with control groups averaging 51 body bends per minute (bb/m) and the experimental group averaging 46 bb/m. Analysis of effects of enhanced autophagy by Rapamycin are currently underway and results will be presented at the meeting.

**83. Induced Autophagy and Lanthionine Ketimine Show a Neuroprotective Role in *C. elegans*.**

Tyler Mitchum (Dr. Andrea Holgado) SWOSU Department of Biological Sciences

Despite the wealth of information surrounding axonal elongation and autophagy, it is still unclear why neuronal components shown to work at the level of axonal outgrowth and cytoskeleton stability bind to components of the autophagy machinery. Moreover, it is undetermined how the brain metabolite and neurotrophic agent Lanthionine ketimine (LK) promotes axonal outgrowth in *unc-33* mutant nematodes. To shed light on the molecular players acting on axonal extension, we proceeded to study the effects of autophagy and LK on promoting axonal elongation. Based on previous work from our laboratory we hypothesized that axonal elongation defects observed in *unc-33* mutants can be ameliorated by simultaneously inducing autophagy, a cellular recycling process, and treating nematodes with LKE (a cell-permeable ester form of LK). To test this hypothesis, we performed imaging analyses of fluorescently labeled axons of nematodes grown in the presence of LKE and possessing a temperature sensitive mutation that produces enhanced autophagy. Quantification of the prevalence of axonal abnormalities shows that autophagy induction significantly reduces the number of axons deformed by branching, bundling, and early terminations. Moreover, studies of LKE treatment demonstrated that the benefits of this treatment are additive to those of enhanced autophagy. Likewise, results of motility in liquid media also showed statistically significant differences between each of the experimental groups from the control, supporting that autophagy and LKE summate in their potential to rescue locomotion defects. Taken together, these results show that axonal outgrowth is directly or indirectly regulated by manipulating autophagy and the availability of LK.

- 84. The Effects of VSM-1 Expression in Mitochondrial Localization in C.elegans.** Tosha Williams (Dr. Andrea Holgado) SWOSU Department of Biological Sciences

VSM-1, also known as v-SNARE master protein 1, is a protein that is shown to be a synaptobrevin interacting partner in yeast. Studies by Gerst and colleagues demonstrated that the absence of VSM-1 lead to more exocytic function, which suggests VSM-1 has an inhibition role in the membrane fusion process. Research performed in our laboratory shows that *C. elegans* VSM-1 mutants have enhanced synaptic physiology and overproduction of Major Sperm Proteins (MSPs), which suggest that VSM-1 and MSPs may have a role in the regulation of synaptic function. Along with this, work by Han and colleagues show in fruit flies that MSPs play a part in the regulation of mitochondrial localization and growth cone morphology. Therefore, we hypothesize that the VSM-1 may alter MSPs expression, and in turn modulate mitochondrial localization. To test if this is validated experimentally, three strains of *C. elegans* were used to examine mitochondrial localization and physiology, strain SD1347 expressing body wall muscle mitochondrial GFP, strain AMH82 expressing body wall muscle mitochondrial GFP in a *vsm-1* mutant background, and strain AMH56 expressing body wall muscle mitochondrial GFP in an overexpressing neuronal VSM-1 background in neurons. Analysis of these strains using a fluorescently labeled red mitochondrial tracker revealed that lack of VSM-1 does not affect the distribution of physiologically active mitochondria. On the other hand, overexpression of neuronal VSM-1 resulted in altered muscle mitochondrial density and distinguishable localization patterns. Additionally, survival assays after the exposure to the toxic effects of Paraquat-induced reactive oxygen species (ROS) show that animals overexpressing neuronal VSM-1 were hypersensitive and had significant statistical difference in survival percentages compared to the control group. Last, locomotion assays provided that the overexpression of neuronal VSM-1 had a significant statistical difference from the control suggesting that VSM-1 expression may affect movement. Studies testing whether ATP concentrations are linked to the mitochondrial differences along with variation in locomotion are underway via the use of the fluorescent ATP measurement system ENLITEN (Promega).

- 85. Manipulation of Autophagy Increases Axonal Development and Function.** Rebecca Gaglia (Dr. Andrea Holgado) SWOSU Department of Biological Sciences

UNC-33 *C. elegans* hypomorph mutants exhibit inhibited axonal growth cone filopodial extension and premature termination. This leads to uncoordinated movement and decrease in overall motility. In our laboratory we are interested in finding means for rescuing *unc-33* axonal defects and related motility deficiencies. We are investigating whether a secondary mutation producing an increase in autophagy will generate a correlated increase in axonal guidance and extension and facilitate motility in *unc-33* mutants. We hypothesize the increase will have the desired effects, due to decrease in growth cone area and prematurely terminated axons that hinder appropriate neural function. To test this we are utilizing a temperature sensitive *unc-33* mutant. This strain at Non-Permissive Temperature (NPT) has induced increase in autophagy; and at the Permissive Temperature (PT) has basal levels of autophagy. Motility assay and growth cone areas were assessed in NPT and PT groups as well as wild type animals. Quantification of motility rates in liquid media suggests that increase in autophagy in the NPT mutants did in fact increase the animals' motility. Imaging assays also indicate a correlation between the increase in autophagy and rescue of the growth cone area. The analysis of the temperature sensitive mutant strain supports our working model and hypothesis.

- 86. Using the At-Risk Tool to Assess the Vulnerability of Native Medicinal and Edible Plants to Over Harvest.** Dr. Lisa Castle, SWOSU Department of Biological Sciences

Using the United Plant Savers' At-Risk Assessment Tool, students in Dr. Castle's Spring 2016 Plant Taxonomy class scored plant species in order to determine their vulnerability to over-harvest. We report about the successes and shortcomings relative to the project's educational goals: to increase our use of botanical terminology and increase our awareness of conservation efforts and challenges. This data includes a comparison of 15 plants ranked by students, including invasive species and wild-harvested edible plants

- 87. *Cyclanthera dissecta*:** Population dynamics and fluctuations in response to environment. Melani Knisley (Dr. Lisa Castle) SWOSU Department of Biological Sciences

Students at Southwestern Oklahoma State University are monitoring the population of *Cyclanthera dissecta* (cut leaf cyclanthera, Cucurbitaceae) in a riparian woodland in Western Oklahoma. By measuring and mapping all individuals for six years while investigating interspecific interactions and environmental tolerances, we seek a more complete understanding of the population dynamics of this weedy native annual vine. *Cyclanthera dissecta* was chosen because of its interesting characteristics: populations reportedly "popping up" out of nowhere, dispersal through forcible ejection, and potential edible and medicinal properties; and also because of practical concerns: it flowers and fruits during the school year, the seeds are large, and the plants are easy for undergraduates in general biology classes to learn to identify. While the species does have many unusual traits, it is not unusual among native or invasive plant species in being poorly studied. We hope to establish baseline data for "normal" population parameters. This information can be then used to better gauge the effects of environmental changes on native plants and serve as a case study representative of the many other poorly-investigated species. During the first six-seasons of the study, we have found dramatic fluctuations in population size (ranging from 14 to 326 individuals), reproductive output and plant size. We found evidence for a seed bank and population limitation due to both abiotic (drought and early freeze) and biotic (disease and herbivory) processes.

- 88. 1,4,7,10,13-pentaazacyclopentadane: A more efficient synthesis; new transition metal complexes; and cross-bridging via its glyoxal condensate.** Dillon Shockey, Elisabeth Allbritton, Abbagale Bond, Darby Bryce, and Anthony Shircliff (Dr. Tim Hubin) SWOSU Department of Chemistry & Physics

Tetraazamacrocycles, those with four nitrogen atoms, have been ubiquitously exploited as transition metal ligands for a variety of purposes, including catalysis, medical imaging, pharmaceuticals, etc... However, the pentaazamacrocycles, those with 5 nitrogen atoms, are much less commonly used for similar purposes because of unavailability, difficulty in synthesizing them, and largely unknown metal coordination properties. We set out to explore this type of macrocycle and its transition metal complexes. A well respected synthetic route to parent pentaazamacrocycle 15aneN5 was useful, but appeared unnecessarily long and complex. We simplified and shortened this synthetic route without a drop in yield. Eight different transition metal complexes were made using typical complexation methods. Electrospray mass spectra and elemental analyses were used to initially characterize the complexes. A cross-bridging strategy for 15aneN5 based on its glyoxal condensate was successfully designed and carried out.

- 89. Unsymmetric Bis-Tetraazamacrocycle Transition Metal Complexes as CXCR4 Antagonists.** Donnie Jones and Ashlie Walker (Dr. Tim Hubin and Dr. Steve Archibald) SWOSU Department of Chemistry & Physics and University of Hull Department of Chemistry

Objective: CXCR4 chemokine receptors, together with their specific natural ligand, CXCL12, play a role in a number of disease states. We have developed efficient symmetric CXCR4 antagonists in prior work. Our objectives were to synthesize unsymmetric bis-tetraazamacrocycle metal complexes and to characterize their chemical properties prior to determining if linking two different macrocycles enhances the antagonism of CXCR4. Methods: Synthetic routes extending our bis-linked ligand syntheses to use a step-wise linking process where two different macrocycles can be successively added to the linking xylene group were developed. Copper(II), nickel(II), cobalt(II), and zinc(II) complexes were made using our previous methods. Electrospray mass spectra and elemental analyses were used to initially characterize the complexes. Results: The ligand syntheses of the side-bridged and cross-bridged unsymmetric ligands proceeded similarly to the previously developed bis-ligand routes. Complexation with the desired metal ions proceeded as expected. Evaluation of these compounds as chemokine receptor antagonists by calcium ion

signalling is ongoing. Conclusions: Unsymmetric bis-linked bridged tetraazamacrocycles are easily produced, using the new step-wise linking procedure. Metal ion complexation proceeds smoothly following known procedures. CXCR4 antagonism by these complexes is highly efficient as determined by calcium ion signalling studies. The resulting complexes will inform our understanding of the requirements for producing even more efficient CXCR4 antagonists of this class.

- 90. Synthesis of A-factor Analogue for Chemical Signaling.** John Woods (Dr. Trevor Ellis) SWOSU Department of Chemistry and Physics

Substituted gamma-butyrolactones such as A factor are known signaling agents produced by Actinobacteria. These signaling molecules trigger the production of secondary metabolites from biosynthetic pathways that are suppressed or silenced under normal conditions. Since Streptomyces, an Actinobacteria, has proven to be a remarkable source of antibiotics, these signaling molecules present a unique opportunity to capitalize on the complete biosynthetic capabilities of these impressive bacteria and open avenues toward the identification of new antibiotic compounds. Therefore the focus of this investigation has been directed toward the preparation of a general series of these signaling agents to be used for the future studies toward the identification of new antibiotics through chemically induced pathways. The synthetic approach taken was intended to be straightforward, reliable, and scalable. Building on literature examples our interest has remained on the modification of known synthetic pathways in order to achieve a scalable laboratory preparation of these materials.

- 91. Preparation of Novel Metal (III) Complexes of Amino Acid Schiff's Bases.** Andrea Fernandez (Dr. Trevor Ellis) SWOSU Department of Chemistry and Physics

The synthesis of trivalent metal complexes which incorporate an amino acid residue is an interesting endeavor. The versatility of these complexes, which incorporate dianionic tetra-dentate ligands with a labile anionic ligand, open opportunities in synthetic chemistry as potential catalysts for various reaction types. Of even greater interest is the opportunity for the introduction of an asymmetric center which would allow for asymmetric catalysis of the reaction providing three-dimensional control of the final products. Within this poster we will describe our initial efforts for the preparation of these unique complexes utilizing a variety of synthetic methodologies.

- 92. Streptomyces spp. co-culture induction of antimicrobial bioactive agents.** Jesse Velasco, Gwendolyn Burgess, Kody Shoff, and Brianna Hassett (Dr. Jon Henrikson) SWOSU Department of Chemistry and Physics

Streptomyces spp. have long been an attractive source of antibiotics through the secondary metabolites produced. With the prevalence of genome sequencing, we now know that there are many other secondary metabolites that could be produced by the organism but not yet isolated in the laboratory. Thus far, we have begun to build our Streptomyces spp. isolate library and evaluate the antimicrobial activities of the Streptomyces spp. isolates through a soft-agar diffusion assay versus a panel of microbial strains. We are currently investigating the induction and enhancement of antimicrobial production through chemical signaling using co-culturing or incorporation of small-organic molecule in the culture media. These changes are monitored through our soft-agar diffusion assays and changes in mass spectrometry profiles.

- 93. Preparation of Single Crystals of Dirhenium Compounds.** Marly Fixico-Hardison and Shelby Austin (Dr. David Esjornson) SWOSU Department of Chemistry and Physics

The most definitive determination of molecular structure comes from X-ray Crystallography. X-ray crystallography is a technique that uses the distinctive patterns formed when X-rays pass through a well-ordered crystal. These patterns depend on the type and location of the atoms in the crystal. A high quality, single crystal is required. For a series of catalytic model compounds that resist

crystallization, a variety of crystal growing techniques have been employed. Vapor diffusion, reverse vapor diffusion, controlled evaporation, solvent layering, and temperature gradients have all been attempted in order to grow single crystals of several dirhenium compounds. Any crystals formed will be sent to the Service Crystallography at the Advanced Light Source (SCrALS) project for further analysis.

**94. Synthesis and Characterization of Bis-nitrile Dirhenium Compounds.** Gareth Crispin (Dr. David Esjoms) SWOSU Department of Chemistry and Physics

The asymmetric dirhenium complexes  $[\text{Re}_2\text{Cl}_3(\mu\text{-dppE})_2(\text{RCN})_2]\text{PF}_6$ , where  $\text{R}=\text{CH}_3$ ,  $\text{CH}_2\text{CH}_3$ ,  $\text{CH}(\text{CH}_3)_2$  and  $\text{dppE} = 1,1\text{-bis}(\text{-diphenylphosphino})\text{ethene}$ , have been prepared. The asymmetry is between the two Rhenium atoms. One of the Rhenium atoms in the  $\text{Re}_2^{4+}$  core has a coordination number of five; the other rhenium atom has a coordination number of six. Infrared Spectroscopy, Proton, Phosphorus-31, and Carbon-13 Nuclear Magnetic Resonance Spectroscopy, Ultraviolet-visible Spectroscopy, Cyclic Voltammetry, Electro-spray Mass Spectrometry and Elemental Analysis are all in accord with the proposed formulation. Compounds of this type have been previously shown to react with small, unsaturated organic molecules.

**95. Investigation of the activity and mechanism of DNA cleavage by cobalt cyclen and cobalt cyclam complexes.** Megan Oertel (Dr. Lori Gwyn) SWOSU Department of Chemistry and Physics

Metal containing complexes such as Fe-EDTA have been shown to be excellent DNA cleaving agents. For the purposes of this project, the activity and mechanism of DNA cleavage by Cobalt containing complexes, such as Co-Bcyclam, Co-Bcyclen, Co-Bn2 cyclam, and Co-Bn2 cyclen were explored. In DNA cleavage assays employing pUC19 as the substrate, all of these complexes exhibited the ability to cleave phosphodiester bonds in the pUC19 DNA backbone. In addition, the mechanism of hydrolysis of these metals was tested by measuring DNA cleavage in the presence and absence of hydrogen peroxide. All four Cobalt complexes were shown to operate using both expected mechanism: an oxidative and hydrolytic mechanism. This makes these molecules excellent candidates for use as cleavage agents in synthetic nucleases. Custom made synthetic nucleases that specifically target specific DNA sequences and hydrolyze a specific bond could revolutionize the genetic engineering and gene therapy industries. The ability of the potential cleavage agent to operate via hydrolytic mechanism is imperative as it does not depend on the introduction of free radicals which could harm a biological system. The different ligands associated with these four cobalt complexes appear to have similar reaction rates but it is currently unknown how sequence specific they are individually. Future work includes investigating sequence specificity of each complex by running DNA cleavage reactions with varied DNA sequences as substrates and comparing different kinetic parameters. If these molecules are shown to be nonspecific cleavage agents, a specific targeting sequence can be added to the metal complex as a DNA binding domain to make the nuclease more specific DNA sequences, the ligands can then be compared and potentially altered to attack desired sequences.

**96. BioBrick Assembly of metal biosensors as a student research experience in Biochemistry teaching labs.** Madison Duckwall (Dr. Lori Gwyn) SWOSU Department of Chemistry and Physics

There is a growing consensus that chemistry students benefit from first hand research experiences as opposed to traditional cookbook laboratory experiments. Introduction of research experiences in Biochemistry teaching labs has somewhat lagged behind. By taking advantage of BioBrick Assembly, students can design simple biosensors that consist of metal-sensitive promoter and a reporter gene. As a proof of concept, students were asked to make an Arsenic biosensor. Arsenic biosensors are of interest to the local community as Arsenic levels in the ground water are typically right at the accepted Environmental Protection Agency levels of 0.01 ppm. Being able to detect micro quantities of As could open doors to work with local water purification and chemical plants, as well as benefit the general population of Weatherford, OK. The use of BioBricks is not a new

procedure; however, its use as a teaching tool is fairly new to Biochemistry teaching labs. There are thousands of potential BioBrick promoter and reporter gene possibilities for this experiment. The idea is for students to design a sensor based on a set of provided environmental conditions, construct their biosensor, and test the sensitivity of their promoters, yielding endless possibilities. Arsenic biosensors were developed using synthetic biology techniques. Several reporter, promoter and destination plasmid BioBricks were obtained. EcoRI and SpeI restriction enzymes were used to hydrolyze the DNA of individual promoter genes, reporter genes, and destination plasmids. The reporter used, K592009, is a blue chromoprotein that fluoresces blue in the presence of arsenate, indicative of the success of the reaction. From the restriction digests, the three reactions were combined with DNA Ligase and incubated. The newly constructed plasmids were transformed into appropriate strains of *E. coli* and plated on different arsenic containing media. In this way, all students learn key biochemical techniques including DNA manipulation with restriction enzymes and ligases and subsequent analysis of plasmid DNA construction using Agarose gel electrophoresis while contributing to the greater good. In addition to the experiment itself, a portion of the lab discussion is devoted to the exploration of different bioethics topics. Future directions will include the investigation of the perception of societal and environmental impacts of BioBrick assembly by use of a pre/post-experiment survey.

**97. Copper and Nickel complexes as DNA cleavage components for use in Artificial Nucleases.** Sequojah O'Neal-Johnson (Dr. Lori Gwyn) SWOSU Department of Chemistry and Physics

Antibiotic resistant bacteria such as methicillin resistant staph. aureus (MRSA) have proven to be deadly and present many complications in treatment. One possible alternative to traditional antibiotics is to engineer artificial nucleases designed to attach the genes of antibiotic resistant bacteria. Nucleases are enzymes that hydrolyze phosphodiester bonds in the backbone of nucleic acids. Currently there is a limited repertoire of naturally occurring nucleases with varied target binding specificities. Nucleases possess a DNA cleavage and binding domain which make them ideal for modular design. Metal ion chelates are compounds shown to possess some DNA cleavage capacity. In this study, the DNA cleavage activity of novel copper and nickel compounds in the presence and absence of hydrogen peroxide both yielded hydrolysis products of the plasmid pUC19. It is apparent that an oxidative mechanism in the presence of peroxide seems to be favored possible due to increased longevity of the overall reaction. Currently, nickel compounds have shown more consistent activity when compared to copper compounds. Work is in progress to incorporate a specific DNA binding domain with the metal complexes to target specific sequences for cleavage using TAL effectors. Future directions include investigating the target specific of the metal complexes with and without a separate DNA binding domain.

**98. Investigating the Origin of GTP Inhibition within *E. coli* CTP Synthetase.** Ashley Pickens (Dr. Jason Johnson) SWOSU Department of Chemistry and Physics

CTP synthetase (CTPS) is responsible for the de novo synthesis of CTP from UTP, using activated glutamine as the amino donor molecule. Since the enzyme supports DNA replication and concomitant cell division, cancers have been found to be sensitive to drugs that competitively bind within either the pyrimidine pocket or the glutamine active site of CTPS. Recent observations that the allosteric ligand GTP not only activates glutamine hydrolysis activity at low concentrations, but also inhibits CTP synthesis activity at higher concentrations also suggest the GTP analogs might serve as antineoplastic agents. However, earlier research groups report, and our own studies agree, that GTP and its analogs act only as potent activators of CTPS activity, showing no evidence for GTP-mediated inhibition. Certainly, a prerequisite for the rational design of GTP analog drugs is a clear reconciliation of the ligand's impact on CTPS activity. Therefore, we are investigating the origin of reported discrepancies in the mechanism whereby the allosteric effector GTP impacts CTP synthetase activity. Methods include site-directed mutagenesis of CTPS residues highlighted from structural and sequence analysis to potentially mediate the GTP-induced allosteric change, and the expression, purification, and kinetic analysis of the resultant protein variants.

- 99. Computational study of the decomposition of 2-azido-2-nitropropane radical anion.** Daniel Ramirez (Dr. William Kelly) SWOSU Department of Chemistry and Physics

Computational evaluation of the decomposition of 2-azido-2-nitropropane radical anions. S<sub>rn</sub>1 reactions of α-substituted nitroalkanes occur by a multi-step chain-reaction mechanism involving radical anion and radical intermediates. The rate-determining step involves cleavage of the intermediate radical anion, R<sub>2</sub>CXNO<sup>-2</sup>·, to give a radical and an anion, and occurs by one of two pathways, either loss of X· or NO<sub>2</sub>·. The direction of dissociation is usually determined by bond strength and nucleofugal properties of the anion. The α-nitroazide, R<sub>2</sub>CN<sub>3</sub>NO<sub>2</sub>, dissociation presents an unexpected case in which cleavage proceeds with loss of NO<sub>2</sub>·, the poorer nucleofuge. Highly accurate CBS-QB3 and CBS-APNO compound model calculations indicate that loss of the N<sup>-3</sup>· is favored by 6-9 kcal in 2-azido-2-nitropropane. Comparison of the C-N bond lengths in 2-azido-2-nitropropane and its radical anion optimized at MP2/6-311+Gd,p model chemistries show an elongation of the C-N<sub>3</sub> bond and shortening of the C-NO<sub>2</sub> bond in the radical anion, suggesting that loss of N<sub>3</sub> should be favored. However, transition state energies determined at MP2/6-311+Gdf,p //CCSD/6-311+Gdf,p indicate that the activation energy for NO<sub>2</sub>-loss is lower by 5 kcal/mol. Examination of the radical anion SOMO spin-density confirms that the unpaired electron resides primarily on the nitro group, therefore major electronic reorganization is not necessary prior to dissociation, which may explain why loss of nitrite is favored over loss of azide.

- 100. Hydroboration-oxidation reactions in the undergraduate teaching laboratory: Reagent and reaction condition choices for optimizing student success.** Dr. David Martyn, SWOSU Department of Chemistry and Physics

Hydroboration-oxidation reactions of alkenes using different borane reagents and conditions were explored in hopes of optimizing student yields and improving undergraduate laboratory experiences. Reactions were quantitatively compared using teaching laboratory generated data. Both efficiency of conversion and reproducibility were determined using NMR analysis.

- 101. Evidence-Based Practice: Fall Prevention in Adults.** Taylor Bromlow, Alexandria Garza, Camrel Kimbro, Abby Sheik, and Jennifer Torres (Ms. Mary Carrell) SWOSU School of Nursing

Fall prevention in adults is imperative to prevent injury during hospitalization. In 2010, it was estimated that costs related to hospital falls was on the breach of surpassing \$30 billion (Hill & Fauerbach, 2014). These alarming statistics led to the following scholarly activity project question: When promoting patient safety in the healthcare setting, what is the best evidence-based practice to prevent falls in the adult population? Methods included conducting a literature review, a policy and procedure review, and observation of fall prevention interventions in the clinical setting. Although the literature review recommended several evidenced-based interventions for fall prevention, it did not identify one specific intervention as superior over the others. Findings suggested that bed positioning, bed and chair alarms, fall risk assessments, gait belts, hourly rounding, and patient education need to be used in conjunction with each other to prevent falls. The policy & procedures and observations of fall prevention interventions were consistent with findings in the literature. Implications for nursing practice, education, and research were provided.

- 102. Evidenced-Based Practice: Back Injury Prevention Among Nurses.** Daley McGuire, Allison Mills, Emma Wedel, Logan Ellzey, Katelynn Black, and Chance Perry (Ms. Mary Carrell and Dr. Kathy Wolff) SWOSU School of Nursing

Each year approximately 12% of nurses leave the healthcare field due to back injuries (Gropelli & Corle, 2010). The government pays approximately 16 billion dollars per year due to musculoskeletal/lower back injuries within the healthcare industry (Utah Nurses Association, 2010). These adverse effects led to the following scholarly activity project question: What is the best evidenced-based practice to prevent back injury among nurses without forfeiting adequate and quality care of patients? Methods included conducting a literature review, a policy and procedure review and observation of various patient handling activities in the clinical setting. The literature suggested that implementing a safe patient-handling program significantly reduced back injuries among nurses. The guidelines for the safe patient-handling program include a no manual lift policy, proper use of ergonomic equipment, and an employee training program for all employees directly involved in patient care. Implementing a safe patient-handling program is the best way to prevent back injuries among nurses. The policy & procedures and observation of patient handling techniques were consistent with the findings in the literature. Implications for nursing practice, education and research were provided. References Gropelli, T. M., & Corle, K. (2010). Nurses' and therapists' experiences with occupational musculoskeletal injuries. *American Association of Occupational Health Nurses Journal*, 58(4), 159-165. <http://dx.doi.org.libnet.swosu.edu/10.3928/08910162-20100316-01> Utah Nurses Association. (2010). The elephant in the room: huge rates of nursing and healthcare worker injury. *Utah Nurse*, 19(1), 1-2, 4-5.

- 103. Evidence-Based Practice: Promoting Nurse Retention.** Stormy Foley, Shaylee Kilhoffer, Rebecca Plunk, Tosha Redd, Meagan Saxton, and Taylor Smith (Ms. Mary Carrell and Dr. Kathy Wolff) SWOSU School of Nursing

Nursing turnover is an increasing problem in the healthcare setting. According to Welding (2011), roughly three-fourths of new nurses cost the hospitals \$22,000 by leaving their jobs in the first year. With this disconcerting statistic, one can only assume that something needs to be done to halt the persistent increase in turnover. These findings led to the following scholarly activity project question: What is the best evidence-based practice to promote nurse retention? The literature suggested several factors that could promote retention and improve the nurse turnover rate. Methods included conducting a literature review, a policy and procedure review, and observation of positive work environments related to nursing retention in the clinical setting. Although the literature review did not identify one specific, best practice, it suggested that the most influential factor used to promote nursing retention is a positive work environment including orientation programs, teamwork, communication, and adequate nurse to patient ratios. The policy & procedures and observations of nursing retention were consistent with findings in the literature. Implications for nursing practice, education, and research were provided.

- 104. Evidence-Based Practice: Prevention of Heel Pressure Ulcers in Immobile Patients.** Emily Baalman, Christopher Barnhill, Darian Bradford, Devin Connell, Tara Jones, and Lauren Prewett (Dr. Kathy Wolff) SWOSU School of Nursing

Due to the high costs, infection risk, and prolonged hospital stays associated with pressure ulcers, exploration into the best method of prevention is an ongoing endeavor. According to the Agency for Healthcare Research and Quality (2014), taking care of and preventing pressure ulcers costs about \$9.1 to \$11.6 billion every year. These adverse effects led to the following scholarly activity project question: What is the best method for preventing heel pressure ulcers in immobile patients? Methods included conducting a literature review, reviewing policy and procedure, and observing pressure ulcer prevention techniques in the adult clinical setting. While the literature review unearthed several promising methods, such as the use of special wrappings, mattresses, and complete renovation of hospital protocol, no one intervention stood out as best evidence-based practice. One theme with multiple appearances and abundant statistical support is the idea of a pressure ulcer bundle care. Bundle care typically involves 3-5 evidence-based interventions used with the same goal in mind; for pressure ulcer prevention, an example could be a care plan that includes skin assessment, repositioning, and nutritional support. The policy & procedures and

observations of heel pressure ulcer prevention in the clinical setting were consistent with the literature. Implications for nursing practice, education, and research were provided.

- 105. Evidence Based Practice: Preventing Nurse Administered Medication Errors in the Hospital Setting.** Jenna Coons, Austin Eaton, Chris Reyes, Delaney Sharry, and Mai Tran (Dr. Kathy Wolff) SWOSU School of Nursing

Medication errors account for 98,000 deaths every year according to Pham et al. (2012). This alarming statistic led to the following scholarly activity project question: What is the best evidence based practice for preventing nurse administered medication errors in the hospital setting? Although the literature review did not identify one specific preventive intervention as superior over others, findings suggested three methods as best practice. These three methods are the use of Computerized Provider Order Entry Systems, the five patient rights, and medication error prevention education. Methods included conducting a literature review, a policy and procedure review, and observation of medication administration error prevention techniques in the clinical setting. The policy & procedures and observations of medication administration techniques were consistent with findings in the literature. Implications for nursing practice, education, and research were provided.

- 106. Evidence-Based Practice: Non-Pharmacological Pain Management for Children Ages 6 to 12.** Baylee Chisum, Courtney Ernst, Khanh Nguyen, Tyler Ray, Kylee Sawatzky, and Rachel Watkins (Dr. Kathy Wolff) SWOSU School of Nursing

Pain is often under-diagnosed and undertreated among children. Statistics show that within a 3-month time span, 80% of children experience pain at least once, and a majority of children experience pain on a regular basis (Gorodzinsky, Bernacki, Davies, Drendel, & Weisman, 2012). These negative effects led to the following scholarly activity project question: What is the best method of non-pharmacological pain management for children between the ages of 6 and 12? Methods included conducting a literature review, a policy and procedure review, and observation of non-pharmacological pain management techniques in the clinical setting. Although the literature review provided several non-pharmacological interventions, the distraction technique was found to be the most utilized and effective evidenced-based practice. The selected distraction technique was based on the facility's policy, child's age, and nurse's preference. The policy & procedures and observations of distraction techniques were consistent with findings in the literature. Implications for nursing practice, education, and research were provided.

- 107. Evaluation of Stress, Anxiety, and Relaxation Techniques in First Semester Pharmacy Students.** Angelica Lajaunie, Emma Leffler, Nicholas Lockyear, and Gwen Burgess (Dr. Melinda Burgess and Dr. Lisa Appeddu) SWOSU Department of Psychology and SWOSU Department of Pharmaceutical Sciences

The objective was to introduce Pharmacy students to relaxation techniques which could potentially reduce levels of stress and anxiety over the course of Fall 2015. Subjects were recruited from students entering into the first semester of Pharmacy school (N = 41). Baseline stress and anxiety levels were taken prior to the start of exams. Next, subjects were randomly assigned to one of four treatments - a meditation technique (body scan, n= 10; mindfulness, n= 11; or 4 x 4, n= 10) or comparator (power posing, n= 10). For three and a half weeks, subjects were encouraged to conduct their treatments at least twice per week. For the following 8 weeks until the week before finals, subjects had the choice to keep or modify their assigned technique, or to change to another means of relaxation. As hypothesized, subjects perceived they endured a greater amount of stress ( $P < 0.05$ ) and anxiety ( $P < 0.05$ ) since starting Pharmacy school later in the semester as compared to beginning. However, there was no significant differences ( $P > 0.05$ ) in levels of stress or anxiety levels across the four treatments. There was a trend for subjects to rate power posing to be easier to conduct than the meditation techniques during the initial study phase. We will further investigate and present changes made to the assigned treatments, as well as subsequent student perceptions regarding the usefulness, ease, and likeability of performing relaxation techniques.

- 108. Measuring Physiological Variables in Student Pharmacists after Conducting Relaxation and Non-Relaxation Techniques.** Heather Kelley, Emma Leffler, Nicholas Lockyear, and Angelica Lajaunie (Dr. Melinda Burgess and Dr. Lisa Appeddu) SWOSU Department of Psychology and SWOSU Department of Pharmaceutical Sciences

A study was conducted in Spring 2016 which evaluated the acute impact of relaxation and non-relaxation techniques on student psychological and physiological well-being. Student Pharmacists (aged 18 years or older) were randomly assigned to one of five treatments. These include three relaxation interventions (body scan, mindfulness, or 4 x 4 meditation) and two non-relaxation controls (power posing or app gaming). Body temperature, muscle tension, respiration rate, and heart rate were measured on each subject individually in a private setting while they conducted each treatment for 8 to 10 minutes. To compare differences among treatments, we are summarizing the data for each of these variables for each subject. This includes measuring the starting and ending values, minimum and maximum, mean and median values, and overall change. We expect relaxation techniques to lower post-treatment body temperature, muscle tension, respiration rate, and heart rate more than the controls. We will also look at correlations between these physiological measures and the subjects' perceived stress and anxiety levels. The ultimate goal is to change attitudes regarding the benefits of relaxation in future pharmacists.

- 109. Evaluation of the Immediate Impact of Relaxation Techniques on Student Psychological and Physiological Health.** Emma Leffler, Nicholas Lockyear, Angela Lajaunie, and Heather Kelley (Dr. Melinda Burgess and Dr. Lisa Appeddu) SWOSU Department of Psychology and SWOSU Department of Pharmaceutical Sciences

In 2011, the Accreditation Council for Pharmacy Education incorporated a new objective in addressing stress mitigation in Student Pharmacists. This study investigates the acute impact of relaxation techniques on student psychological and physiological well-being by evaluating changes in (1) self-reported levels of stress and anxiety and (2) student perceptions of relaxation techniques. Student Pharmacists (aged 18 years or older) were randomly assigned to one of five treatments. These include three relaxation interventions (body scan, mindfulness, or 4 x 4 meditation) and two non-relaxation controls (power posing or app gaming). In a private setting, each subject (1) provided a pre-treatment salivary sample, (2) completed surveys assessing pre-treatment stress and anxiety levels, plus provided initial perceptions regarding their treatment, (3) performed the assigned treatment, (4) completed post-treatment surveys, and (5) provided a post-treatment salivary sample. We expect relaxation techniques to lower post-treatment stress and anxiety levels more than control treatments. Accordingly, we hypothesize subjects will have improved perceptions toward conducting relaxation techniques. The ultimate goal is to change attitudes regarding the benefits of relaxation in future pharmacists.

## Podium Presentations

*Please Note: The following oral presentations will begin at 12:30 PM in the Bonny Boardroom within the Student Union.*

- 110. National Art Education Association National Convention.** Candice Dougherty, William Barr, Nikki Laitran, and Cheyanne Floyd (Ms. Marsha Carmen and Mr. Todd Parker) Department of Art, Communication and Theatre **12:30 PM**

The NAEA National Convention is an annual event providing substantive professional development services that include the advancement of knowledge in all sessions, events, and activities for the purpose of improving visual arts instruction in American schools. As such, it is the world's largest art education convention. The convention has over 1,000 participatory workshops, panels, seminars for job-alike group, research reports, discussions, exhibits, and tours. World-acclaimed educators, artists, researchers, and scholars also attend to speak on keynote art education issues.

- 111. New metals (V, Pd, Ru) and new amide pendant-arms for cross-bridged tetraazamacrocyclic oxidation catalysts.** Michael-Joseph Gorbet (Dr. Tim Hubin and Dr. Guochuan Yin) SWOSU Department of Chemistry and Physics and Huazhong University of Science and Technology **12:50 PM**

Ethylene cross-bridged tetraazamacrocyclic complexes of manganese and iron are mild oxidation catalysts that can react through a diverse range of oxidation mechanisms. We have embarked on a program of modifying the parent ligand by: (1) adding pendant arms, and (2) exploring derivatives with new metal ions. In this work, we introduce a series of cross- and side-bridged derivatives with amide pendant arms. The amide pendant arms are intended to modify the electronic properties of the metal complexes, perhaps leading to new and/or different oxidation reactivity. Additionally, amide pendant arms can also interact through hydrogen bonds with substrate and/or oxidant molecules, perhaps stabilizing reactive intermediates. Side-bridged derivatives are likely less kinetically stable than the original cross-bridged catalysts, but appear to have modified coordination geometries that may lead to new reactivities and may be stabilized by the additional pendant arm donors. All new ligands have been complexed to Mn, Fe, Co, Ni, Cu, and Zn. We have also begun to investigate the use of additional metal ions that have not previously been complexed to cross-bridged tetraazamacrocyclics, such as V, Pd, and Ru. Some of these complexes have demonstrated interesting oxidation catalysis. The synthesis and characterization of the ligands and the synthesis, electrochemistry, and other characterization of their complexes will be presented.

- 112. Bis- and pendant armed tetraazamacrocyclic transition metal complex dual CXCR4/CCR5 antagonists.** Dustin Davilla and Orry Birdsong (Dr. Tim Hubin) SWOSU Department of Chemistry and Physics **1:10 PM**

Chemokine receptors, together with their specific natural ligands, play a role in a number of disease states. We seek to systematically synthesize and evaluate potential CXCR4/CCR5 dual antagonists based on our published potent transition metal complex CXCR4 antagonists and the only known dual CXCR4/CCR5 antagonist (whose potency is not desirably high against either receptor). Upon synthesis and chemical characterization, and with the help of collaborators, we have evaluated the antagonism of both CXCR4 and CCR5 in cell lines previously developed for such studies-with the results of these screens feeding back into the iterative redesign of additional dual antagonist complexes. Synthetic routes were developed extending side- and cross-bridged ligand syntheses to include dichloropyridine moieties to impart CCR5 activity on tetraazamacrocyclics. Cu, Ni, Co, and Zn, complexes were synthesized. Electrospray mass spectra, elemental analysis, and X-ray crystallography were used to initially characterize the

complexes. The synthesis of the dichloropyridine containing ligands is more synthetically challenging than our typical ethyl cross-bridged ligands. However, single-macrocycle and bis-macrocycle ligands have been made. Complexation with the desired metal ions proceeded as expected. Screening of the metal complex CXCR4 and CCR5 antagonism by calcium ion signalling experiments is ongoing.

**113. Mythic Archetypes in "Sharp Snaffles."** Jarrod Ford (Dr. Kevin Collins) SWOSU Department of Language and Literature **1:30 PM**

With a charming atmosphere and a sophisticated air of awareness, William Gilmore Simms's "Sharp Snaffles" is an ideal picture of the sensibilities of southern literature mixed with that still-southern approach of subtly barbed yet gentlemanly criticism. Simms masterfully crafted a tale capable of several layers of criticism and conversation, ranging from the surface level of that uniquely American "bootstraps" philosophy to much more discreet stabs at capitalist economic practices. The most subtle device Simms employed, however, is that of the structure of the narrative which is most accurately described by Dr. Joseph Campbell's description of a Monomyth, or Hero Cycle. Mark Twain once commented on the importance of method in the delivery of a story; that notion is evident both in how expertly Sharp Snaffles is delivered, and how much of an effective platform for rhetoric the story has become. My paper will examine the narrative structures and archetypes present in "Sharp Snaffles" specifically with respect to how those aspects are described as functioning by Dr. Joseph Campbell in his work, *The Hero with a Thousand Faces*.

**114. Elided Horror: Missing Details That Complete the Writings of Donald Ray Pollack.** P. Montgomery Long (Dr. Kevin Collins) SWOSU Department of Language and Literature **1:50 PM**

This paper will examine the ways in which Donald Ray Pollack uses the elision of details to emphasize horror in his writing. Examples will be taken from both *The Devil All the Time* and selected short stories from *Knockemstiff*. The paper will include close readings of these passages which seem to lack context where context might help the reader to understand the motives and goals of the characters. Comparisons will be drawn to works of absurdist horror and Joseph Conrad's *Heart of Darkness*. The paper will hint that sometimes that which is unknown may be included in the most terrifying aspects of a given text. This idea for this paper came to me when I found myself repeatedly wondering what, exactly, was going on behind the scenes in Pollack's stories. He often refuses to give details which would make the reader feel more comfortable or better able to understand his stories.

**115. Formal Aspects of Selected Novels.** Kwyn Bollinger, Jarrod Ford, Jamie Holsapple, Dakota Kemp, and Rebecca Mulkey (Dr. Victoria Gaydosik) SWOSU Department of Language and Literature **2:10 PM**

Formal elements of the novel include the plot, characters, setting, theme, point of view, symbolism, tone, and literary devices such as metaphor. Taking into consideration a wide range, historically speaking, of British and American novels that have stood the test of time, our panel discussion will compare and contrast various authors' strategies for structuring compelling narratives. Novels under consideration will include *Robinson Crusoe*, *The Vicar of Wakefield*, *Persuasion*, *Jane Eyre*, *Adam Bede*, *Tess of the D'Urbervilles*, *Sister Carrie*, *The Jungle*, *The Secret Sharer*, and *The Big Sleep*. Student presenters will each make a short presentation defining and exemplifying an aspect of form in the genre of the novel, and the group as a whole will also engage in freeform discussion to present and analyze personal preferences and favorites, supported by evidence, in our sample population of long fiction.

**116. Communication Design for People with Visual Disabilities.** Dr. Siriporn Peters, Department of Art, Communication and Theatre **2:30 PM**

Communication design for people with Visual Disabilities was a collaborative project with the Washita Battlefield National Historic Site, National Park Service (NPS) in Cheyenne, Oklahoma. The project aimed to create tactile graphic with braille for the NPS visitors who have visual impairments. The research methodology was Mixed Methods Research by using Participatory Design approach. This research had four main procedures. The first procedure was a consultation meeting and group discussions with stakeholders. The second procedure was a data collection. The third procedure was a design process and making tactile graphic with braille as design research tools. The last procedure was an evaluation. This project is still in a progress. The research findings will be presented at the research and scholarly activities at SWOSU.

**117. Co-Creation Graphic Design for Safeguarding Endangered Languages.** Dr. Siriporn Peters, Department of Art, Communication and Theatre **2:50 PM**

The objectives of this research project are to co-create knowledge and graphic design for Safeguarding Endangered Languages. This project was funded by Proposal Development Award of SWOSU Sponsored Program in 2015-2016. The research methodology was Mixed-Methods Research. According to UNESCO, the Cheyenne and Arapaho languages in Oklahoma are endangered. The participants and stakeholders of this research were Cheyenne and Arapaho Tribes Language Program and the representatives of the Cheyenne and Arapaho nations in Oklahoma. The research was guided by two research questions. The first question was how graphic design could help the participants to safeguard these endangered languages. The second question was how to evaluate the effectiveness of this new design and research project. This research had four research procedures. The first procedure was requirement the participants and stakeholders. The second procedure was data collection with the participants and stakeholders. The third procedure was co-creation graphic design for safeguarding Cheyenne and Arapaho languages. The fourth procedure was implementation and evaluation the effectiveness of the new graphic design and project. The research outcomes revealed that the motion graphics and animation were the most effective means to preserve the audio of Cheyenne and Arapaho languages and pass on the knowledge to young generations. Moreover, it helps to make these languages visible and easy to access. As this project is in the final procedure, the effectiveness of this design and project will be reported at the Research and Scholarly Activity Fair in 2016.

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