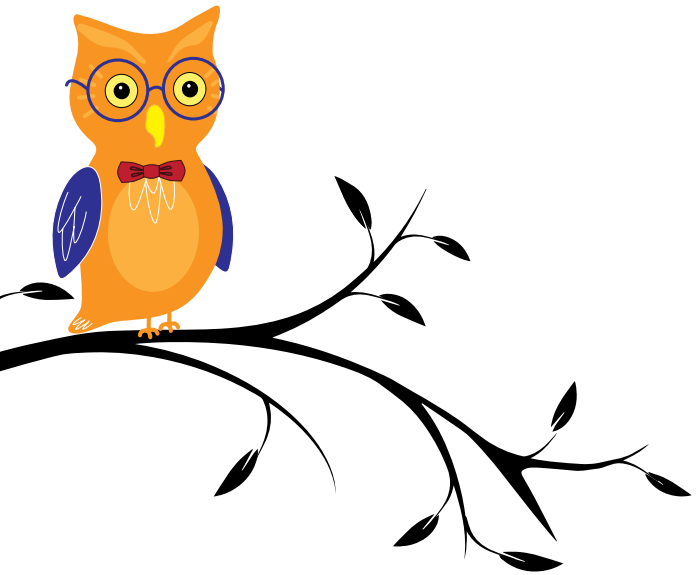
The Seventh Annual Undergraduate Research Symposium

Conference Program

April 26, 2014



Hosted by the Elliott T. Bowers Honors College Ambassadors

A Message from Our Faculty Adviser

Welcome to the Seventh Annual Undergraduate Research Symposium, hosted by the Elliott T. Bowers Honors College Ambassadors. Undergraduate research is "an inquiry or investigation conducted by an undergraduate student that makes an original intellectual or creative contribution to the discipline" (Council on Undergraduate Research), and national studies have shown that undergraduates who participate in research are better prepared for the rigors of graduate school, the realities of the workplace, and the duties of responsible citizenship. They are better communicators and more effective leaders. Presenting at a conference is one of the ways in which students can share their research with a larger academic community. The URS is testament both to the exceptional level of research in which SHSU undergraduates are engaged and to the close relationships between faculty and students that are forged or reinforced through interacting in a professional environment.

The Honors Ambassadors have been working hard this academic year to ensure that the URS is a continued success. Co-chairs Trey Cawley and Heather Woitena spent much of fall semester organizing and directing the URS committees, and along with the ambassadors, disseminated information about the URS across campus and hosted several URS informational sessions. This spring, Trey and Heather improved upon our use of the CHSS and LSC spaces and updated the URS merchandise. The co-chairs also worked closely with Melanie Adams, the Dialogue newsletter editor and URS go-to person extraordinaire, who designed the program and got it to press by the deadline; Melanie also designed our new, scholarly owl logo.

But these active students aren't the only ones who have dedicated themselves to furthering what is now a nation-wide program of fostering and promoting undergraduate research. Others have been just as vigorous in their support, including the faculty advisors, who have helped students with their research; the family and friends, who have come to show their support; the faculty moderator volunteers, who have devoted their Saturday to giving presenters feedback; the staff members and students, who have been working off the clock to ensure that everyone is fed, given gift bags, directed to the right rooms, and checked in properly; and the Honors College and College Deans, who have paid for this entire event because they believe in promoting undergraduate research and in supporting the URS. We recognize and greatly appreciate their kind, open-handed, and active support. Finally, special thanks go to Dr. John Pascarella, Dean of the College of Sciences, for his enthusiastic willingness to serve as a guest speaker during lunch, and to Dr. Hiranya Nath, Department of Economics, for his very generous Annual Assam Scholarship Award. Today is a celebration of our students' involvement in research (and thus, commitment to their future careers) and to SHSU's dedication to undergraduate research.

Dr. Kimberly Bell
Faculty Adviser: Co-Chairs Chair; URS Faculty Committee
Interim Dean- Elliott T. Bowers Honors College

A Message from Our Co-Chairs

It is our pleasure to have helped organize the Seventh Annual Undergraduate Research Symposium. Through the combined effort of the Honors College, our fellow Honors Ambassadors, and various volunteers, we have tried to create a truly unique experience that showcases undergraduate students such as yourselves.

We hope that you receive constructive feedback on your presentations and enjoy the giveaways and food. Our goal is that after today, you leave more passionate about research and more prepared to take lessons learned so as to produce better, and more informative, presentations.

This year's symposium should be one of the most engaging and enlightening yet! We once again thank all of the people that helped plan this event. Thank you for attending and please enjoy this year's presentations.

Heather Woitena
URS Co-Chair

Trey Cawley
URS Co-Chair

The Undergraduate Research Symposium Is Sponsored By:

Elliott T. Bowers Honors College
College of Business Administration
College of Education
College of Fine Arts and Mass Communication
College of Health Sciences
College of Humanities and Social Sciences
College of Sciences

The URS especially thanks Dr. Hiranya Nath for his generous Assam Scholarship

The Undergraduate Research Symposium Faculty Committee:

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Dr. Todd Primm
Dr. Joni Seeling
Dr. Monte Thies
Dr. David Thompson
Dr. Stacy Ulbig
Dr. Candice Williams
Ms. Sonja Yung

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The poster Session will be held in the LSC Ballroom

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*Scholarship awards announced; Symposium Evaluation Forms returned.

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- *B56Î± and B56Î² Function and Specificity*

  Jacy Harrison
  Faculty Adviser: Dr. Joni Seeling

- *Protein Phosphatase 2A Mutations E64G and E64D in Wnt Signaling Pathways of Xenopus Axis Formation*

  Lauren Sommer
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- *IMEI Spoofing and Phone Cloning*

  Andrew Bannon & Drew Carson
  Faculty Adviser: Dr. Andy Bennett

- *Information and Communications Technology (ICT) and Immigration from Africa*

  Sahabia Ahmed
  Faculty Adviser: Dr. Hiranya Nath

- *Effects of Gender and Racea on Occupational Wages*

  Stephen Sears
  Faculty Adviser: Dr. Hiranya Nath

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  Madison Becker
  Faculty Adviser: Dr. Audrey Murfin

- *Self-Doubt*

  Rebekah Edwards
  Faculty Adviser: Dr. Stuart West Gurley

- *How WE Relate to Nothingness: Existentialism Does Not Mean Isolationism*

  Amber Jamison
  Faculty Adviser: Dr. Stuart West Gurley

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  April Paluka
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  Paul Ruiz-Requena
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  Janeane Ward
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  Shirley Tey
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- *Intrageneric Variation of the Inner Ear of Zygaspis (Squamata: Amphisbaenidae) Based on High-Resolution X-ray Computed Tomography*
  Geneva Clark
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  Kelly Carlson
  Faculty Adviser: Dr. Jessica Lucia

- *The Effect of Omega-3 Fatty Acids on Joint Inflammation of Young Horses Undergoing Regular Exercise*

  Julia Swyden
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  Faculty Adviser: Dr. Adam T. Schmidt

- *Childhood Onset Bipolar: Risks, Attributes, Comorbidities, and Treatments*

  Anne Sergi
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- *The Incremental Validity of Neuropsychological Testing for Foster Children*

  Jason Wesson
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  Deborah Koch
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  Joshua Miller
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  Gregory Daniells
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Presentation Abstracts

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*Denotes additional co-authors listed on page 60

Information and Communications Technology (ICT) and Immigration from Africa

Presenter: Sahabia Ahmed

This paper examines the effects of information and communications technology (ICT) on the number of people visiting the United States from different African countries under various nonimmigrant visas. Using annual data for 53 African countries from 2003 to 2010, the paper estimates a fixed effects panel regression model of the number of nonimmigrant visitors (in natural logarithm) on Internet users (as a percentage of the population) and other control variables. The results suggest that Internet use has a positive and statistically significant effect on the number of African visitors to the United States. The results are robust within a number of different model specifications. The results further indicate that while the positive effect of the Internet on the number of visitors on F (student) and H (work) visas is statistically significant, it is not so for B (visitor/tourist) visas.

IMEI Spoofing and Phone Cloning

Presenters: Andrew Bannon & Drew Carson*

According to BusinessInsider.com, "22% of the global population owns a Smartphone." That amounts to 1.6 billion people worldwide who communicate over miles of unmonitored cellular networks. Representing the SHSU Department of Computer Science, our research aims to expose potential methods of malicious attacks on cellular devices and to provide future identity protection for the purpose of undercover law enforcement. The International Mobile Station Equipment Identity (IMEI) is a number, usually unique, to identify GSM mobile devices. The International mobile Subscriber Identity (IMSI) is used to identify the user of a cellular network. Our research comprises three different vectors of IMEI and IMSI spoofing. We hope to change a cellular device's IMEI and IMSI via software, hardware, and over the air (OTA). For spoofing on the hardware and software levels we will use an Octoplus jig box and its native software. For our over the air method we will construct our own cell tower to broadcast our own test network. We will use a Raspberry Pi type A as our computing component and a bladeRF board as our software defined radio front end.

B56Î± and B56É› Phenotypic Analysis

Presenter: Stacy Batres

As any model organism, the frog *Xenopus laevis* possesses optimal characteristics, such as the ability to produce many embryos that develop relatively quickly. This rapid development is optimal for the analysis of the B56 subunits B56Î± and B56É›. These subunits, along with other proteins, make up a degradation complex essential in the Wnt signaling pathway. B56Î± and B56É› have a conserved central core domain and divergent amino- and carboxy-termini. Although B56Î± and B56É› are highly conserved, B56Î± inhibits, while B56É› is required for Wnt signaling. The Wnt pathway plays key roles in cell proliferation and tumor formation. To determine how these two conserved proteins have antagonistic effects on Wnt signaling, plasmids containing B56Î± and B56É› with switched amino- and carboxy-termini will be made. When these chimeric RNA are microinjected into Xenopus embryos, the phenotype of the tadpole will reveal the function of the chimeric isoform. Ventralized embryos with a loss of dorsal-specific gene expression will signify functional B56Î±, while anteriorly truncated embryos with normal dorsal gene expression will signify functional B56É›. In finding the domain(s) that determine B56Î± and B56É› isoform specificity, we will add to the information known. This will allow for more preventive research in tumor growths that develop due to deregulation of this pathway.

Round and Round: Comparing the Differing Existentialist Viewpoints in Kobo Abe's "Woman in the Dunes," and Albert Camus's "The Myth of Sisyphus"

Presenter: Madison Becker

The purpose of life is by no means a light topic. Many individuals ponder endlessly the depths of humanity's purpose, as well as his or her own significance. However, are these moments spent thinking such thoughts simply a waste of time? According to some existentialists, they might as well be. Existentialists believe that life has no purpose, and, unfortunately, that all humans eventually submit to this truth. There is some debate, however, on whether or not this purposelessness should be viewed from a negative or positive outlook. In *Woman in the Dunes*, Kobo Abe creates a riveting surreal tale from the negative perspective. In contrast, Albert Camus explores the positives of purposelessness in his essay "The Myth of Sisyphus." Even though these authors have conflicting viewpoints on the nature of existentialism, both Abe and Camus utilize the concept of cycles throughout their stories to explain their unique perceptions. In this thought-provoking presentation, the pros and cons of purposelessness will be examined through the lens of Abe and Camus's works.

Phoradendron leucarpum: Development of Microsatellite Markers for Assessment of Population Genetic Structure

Presenter: Said Benitez*

Phoradendron leucarpum (Raf.) Reveal & M.C. Johnst. (leafy mistletoe) is a hemiparasitic plant belonging to the family Viscaceae. This hemiparasitic plant retains its ability of photosynthesis and obtains water, minerals, and nutrients from the host plant. *Phoradendron serotinum* is broadly distributed in N. America, from southern New Jersey to southern Florida, throughout the Midwest south of Oklahoma to northern and central Mexico, and the west coast from Baja California to Oregon. The taxonomy of *Phoradendron* has been uncertain, but with this project, the use of molecular and morphometric analyses will help resolve taxonomic issues within *Phoradendron serotinum*. The current classification of *Phoradendron serotinum* implies that the four subspecies constitute separate cohesive genetic units, representing four distinct populations with little gene flow among subspecies. This hypothesis suggests that the distribution of alleles in these populations should result in a high genetic differentiation among subspecies and limited gene flow. Underlying genetic structure will be explored through assessment of micro-satellite markers. Traditional population genetic estimation of gene flow and population differentiation (Nm and FST) and Bayesian population structure simulation will be used to test the hypothesis of genetic coherence of putative subspecies throughout the natural range.

Evaluating the Efficiency of the Cladokit in Science Education

Presenter: Lucas Boykin

The purpose of this research is to investigate possible alternatives to current science education methods. The Cladokit is a novel science kit designed to integrate the lessons of evolutionary biology into the public school system in a game format. The Cladokit uses the scientific concept of cladograms (hypothesized relations between species displayed over a branching diagram) to teach students in elementary schools how organisms can be connected using similar and/or differing characteristics. This research project focuses on testing the Cladokit's efficiency; if students who experience the Cladokit perform better than students who have not, then it can be concluded that the Cladokit is an effective way to integrate basic biology lessons into the educational system. If successful, the Cladokit would meet many sections of Texas's educational standards as detailed in the TEKS, but would do so in an interactive format to engage the students in scientific gameplay.

Antibiotic Exposure Strongly Changes the Normal Microbiota of an Animal

Presenter: Jeanette M. Carlson*

Antibiotics are powerful tools that are commonly used in medical sciences to treat bacterial infections, but recent studies have suggested harmful side effects from disruption of the natural microbiome. This microbiome consists of hundreds of microbial species on an animal, many having beneficial effects on nutrition, immunity, and other areas. As a comparative analysis to the human gut microflora, we are using *Gambusia affinis,* a small fresh water fish as a model organism to study the microbiome. Over a period of time trials, we exposed fish to a broad-spectrum antibiotic called rifampin. Bacteria were extracted from the fish skin before, during, and after antibiotic exposure, and dilutions plated on various medias to culture bacteria. Colony numbers on the agar plates dropped drastically in the first 12 hours but returned to pre-exposure levels in 2-3 days. In the same time the entire bacterial community became 100% rifampicin resistant. DNA sequencing showed that the species present in the community changed strongly. Our findings assess the support of our hypothesis and aides in a better understanding of the disruption that antibiotics have on the natural microbiome. Future studies include ways to enhance the regain of a normal state of the microbiota after drug exposure.

The Influence of Ambient Temperature on Exercise Performance in Young Horses

Presenter: Kelly Carlson*

Texas is home to more than one million horses, and Texans place great emphasis on the young equine athlete. Despite the significance of fatigue-related problems in young performance horses, adequate attention has not been devoted to the development of daily training strategies to prevent or delay the onset of career-ending injuries. Therefore, in the proposed study, eight two- to three-year-old Quarter horses will be utilized in a randomized complete block design to characterize thermal and cardiorespiratory responses to evaluate the effects of heat-related stress in young, exercising horses. Horses will be housed in stalls and exercised at the SHSU Indoor Riding Facility for the seven-day trial. Heart rate, respiration rate, rectal temperature, and ocular temperature will be obtained in horses conducting exercise in a morning (6:00 am) and afternoon (1:00 pm) exercise bout. Blood samples will be analyzed for lactate and cortisol concentrations to determine the intensity and stress levels, respectively. Our investigation of physiological responses on young performance horses will benefit the equine industry in establishing daily training regimens in hot, humid climates. This study will provide initial data to establish an exercise model to alter physiological responses, and the findings from it will form the basis of the presentation.

Can Community Research Be Crowdsourced? A Community Needs Assessment of Juvenile Delinquency and Victim Services in Walker County

Presenter: Trey Cawley

Crowdsourcing has been used successfully by various disciplines to gather ideas, content, and services using a non-professional, distributed workforce. This method could also be applied to gathering important community information. The current research uses students to conduct a community needs assessment to determine and describe the service needs of the children of Walker County, Texas. As part of an Active Community Engagement program, students enrolled in a Victimology course at SHSU during the Spring 2014 semester conducted qualitative interviews with key stakeholders in the community. Along with uncovering needs for a special population and raising overall awareness of the issue amongst stakeholders, the project introduced field work to undergraduate students. Specifically, they experienced a teaching method that involves Academic Community Engagement as well as learned skills, such as how to identify and schedule interviews with key stakeholders, how to conduct and record qualitative interviews, how to transcribe those interviews, how to give group presentations of findings, and how to write a final report.

Intrageneric Variation of the Inner Ear of Zygaspis (Squamata: Amphisbaenidae) based on High-Resolution X-ray Computed Tomography

Presenter: Geneva Clark*

Amphisbaenians form a clade of fossorial lizards situated within the order Squamata. Since they have adapted to a fossorial lifestyle, their eyes are vestigial, and they do not rely on sight. Instead, both hearing and smell are used for navigation through the earth and finding prey. Here we examine differences in the morphology of the inner ear, and how it translates into species specific differences. However, their miniature size makes traditionally invasive methods (i.e. dissection) not viable. Using high-resolution X-ray computed tomography (HRXCT) we reconstructed the hearing and balance organs of these specimens with digital endocasts. Endocasts are hollow projections that allow for a detailed view of how the inner ears would appear, although they tend to overestimate the dimensions of an area. We controlled for regional differences by only using species from the same locality (Zimbabwe). Our interspecific comparison consisted of *Z. ferox, Z. niger,* and *Z. vandami*. The semicircular canals of both *Z. ferox* and *Z. niger* are distinctly separate from the vestibule.

Ethnicity & the Healthcare System: A Review of Racial & Ethnic Discrimination among Adult & Pediatric Patients

Presenter: Sarah Crews

Within the United States healthcare system, ethnic minorities have historically received disparate treatment in comparison to Caucasians. Current empirical literature imparts that both adult and pediatric patients of ethnicity still experience discrimination from medical professionals. From substandard physician-patient communication to longer waits on organ transplant lists, discrimination is ubiquitous within healthcare and negatively impacts the physical health and mortality rate of ethnic minority patients by lowering the quality of medical treatment they receive. The purpose of this review paper is to ascertain the current prevalence of racial and ethnic discrimination in healthcare, illuminate its causes and consequences, and explore possible solutions to mitigate the effects of unequal medical treatment among ethnic minorities.

Filial Resilience: An Analysis of Positive Adaptation in Families Affected by Pediatric Chronic Illnesses

Presenter: Sarah Crews*

When a child is diagnosed with a chronic or life-threatening illness, functioning within the child's family can be disrupted. This disruption can be counteracted by the family exhibiting a number of adaptive traits in response to this form of trauma. These traits allow the family to become resilient and promote a return to a healthy level of interaction and communication by helping the family system adjust to the illness. The purpose of this review paper is to summarize the current body of literature on traits contributing to filial resilience. While previous researchers have elucidated traits that contribute to family resilience in specific pediatric chronic illnesses, this paper juxtaposes a number of illnesses (i.e., sickle cell disorder, pediatric cancer, juvenile diabetes) in order to identify traits that have the most significant impact on adaptation in each condition. This comparison will help elucidate both trait commonalities and differences across illnesses, leading to a more thorough understanding of family resilience processes in general. The findings of this paper could aid in bolstering the efficacy of family based interventions for families affected by pediatric chronic illnesses.

That One Night in Time

Presenter: David Cullen*

"That One Night in Time" is an experimental short film about love; about the exact moment that two men realize they have fallen in love with each other. This is a film that is intended to convey something in the audience and for the audience. This film, for it's exploration into sexuality for gay men, and sexuality as a whole is meant to convey to the audience that love is love, regardless of gender.

Modern-day Slavery

Presenter: Gregory Daniells*

Modern-day slavery is an issue of which most people are unaware. This paper will focus on human sex trafficking, children forced to become military soldiers, and children forced to become servants. In this paper, I will argue that slavery in the modern world must be eliminated; otherwise, it will continue to grow and be much harder to eradicate. I will use several principles to argue that slavery is morally impermissible. First, the principle of self-determination, which states that people can form their own good life within the bounds of justice. The next principle I will use is autonomy, which states that every rational person should have the ability to make his or her own decisions. Another is the principle of equality, which states that everyone should have equal consideration. The last standard principle is the second categorical imperative, which states never to treat humans as means to an end but as an end in themselves. Finally, I will include a principle of my own. I call this the principle of human potential, which states that every human has the potential to impact the world in a major way.

Self-Doubt

Presenter: Rebekah Edwards

This presentation unveils an understanding of how the sensibility of Self-Doubt rises in the conscious by means of a philosophical point of view. It begins with a description of how the topic came about through personal experience. An interpretation of the past is supported by vindicating its relationship to the present through the use of psychological aspects and theories to determine where such feelings of Self-Doubt tend to originate and impels an individual to become his or her present-self. An emphasis will be made on how our present-self influences the way we feel about our future by analyzing words from Martin Heidegger in "Being and Time." Heidegger's work shows an awareness of how an existential manifestation of care could be the conclusion in the determining of Self- Doubt's affiliation from our care of the meaning of our death.

Buddhism and the Deviant Act of Self-Immolation

Presenter: Brittany Gregory

The following is a positional paper over the socially deviant act of self-immolation in the Buddhist religion and culture. The paper seeks to determine whether or not the act of self-immolation is counterproductive to the Buddhist religion. Using peer-reviewed research into the study of Buddhism, suicide, and self-immolation acts, the paper examines Buddhist philosophy displaying evidence of both acceptance and disapproval of suicide. This leads to the question of the definition of suicide, which is looked at from both the Durkheim ian sociological perspective and the Buddhist perspective to determine the sociological normalcy of self-immolation within Buddhism and its relevance to Buddhist cultural goals. I conclude that self-immolation is considered a traditional sacrificial act by the Buddhist community, but that there are many thin lines around the act, with it being not the act itself, but the motivation which determines the deviance of the act.

Social Justice Through Social Media

Presenter: Alicia Hammonds

Facebook currently has 1.23 billion active users, Google+ has 300 million active users, Twitter has 243 million monthly active users, and YouTube has 1 billion active users with 4 billion views per day. Such figures prove social media is not a trend in technology but is rather the leader of technology, revolutionizing the way in which the public consumes traditional media. However, there is yet to be a thorough examination to expose the way in which social justice can be achieved through social media. This study examines three key factors: how social media initiates mobilization for social justice, the polarizing effects of social media as a vehicle for political protest, and the gravity of social media in influencing long-term policy change.

B56Î± and B56Î² Function and Specificity

Presenter: Jacy Harrison*

The Wnt pathway has a crucial role in cell growth and controls cell fate during embryonic development. It also controls cell division in self-renewing tissues of adults. With this knowledge of the Wnt pathway, we found that when a mutation occurs it can lead a cell with normal growth to become cancerous. In fact, Wnt pathway deregulation is required for colon cancer formation. One important factor in Wnt signaling is the B56 protein. This gene family contains five different genes called B56alpha, B56beta, B56delta, B56gamma, and B56epsilon. Within these five B56 subunits, B56alpha, B56beta, B56delta, and B56gamma subunits all inhibit the Wnt pathway, while B56epsilon activates it. The central cores of these five B56 subunits are conserved; however, their terminal ends are different. The goal of this research project is to look specifically at B56alpha and B56epsilon to determine where this difference in specificity lays. The Wnt pathway is highly conserved evolutionarily, and we will conduct this research using a frog model system that is able to produce embryos readily. Studying this pathway in frogs will aid in our ability to understand how tumor formation can be suppressed.

The Franco-Prussian War: A Foregone Conclusion

Presenter: Brian Jacobs

The Franco-Prussian War was a turning point in the history of Europe as the Prussian-led North German Confederation emerged victorious from the war and, through their victory, established the newly formed German Empire as the dominant power in continental Europe. The French defeat in the Franco-Prussian War of 1870-1871 was the result of a war that was, at the time, deemed too close to call between what appeared to be two equally matched military powers. In truth, the French defeat was a result that was decided years before the first shots were fired. This outcome occurred thanks to failures in the conduct of Napoleon III in matters of domestic and foreign affairs, the failures of French military forces in the areas of organization, mobilization, logistics, and discipline, and the failure of the infrastructure of France itself, specifically it's railways, in that it was not able to handle the demands placed on it throughout the war.

How WE Relate to Nothingness: Existentialism Does Not Mean Isolationism

Presenter: Amber Jamison

Awareness of one's "being-in-the-world," one's endemic alienation despite participation in life can deter many from seeking to study philosophy. This applies especially to those studying existentialism, where an oft recurring theme of the content is alienation and a kind of heightened awareness of one's self and place in the world. Philosophy as a whole is all too frequently seen as a remote escape for those in special possession of some truth underlying our immediately apparent reality (something ironically–but commonly–referred to as *sub specie aeternitalis*). While this misconception is understandable, the concept of necessary solitude in the study of existentialism is unfounded when the works of those such as Unamuno, Schopenhauer, and McDermott are considered in full. It is possible that the study of our freedom, our "throwness," and our alienation can be done alongside others, and that in time, we may come to understand ourselves as a community of "fellow sufferers."

Sequestration of Gold (III) by Rhodobacter sphaeroides

Presenter: Hannah Johnson

Rhodobacter sphaeroides belongs to Î±-3 subdivision of the Proteobacteria that is metabolically capable to tolerate high levels of toxic heavy metals (lead, zinc, gold and/or mercury). These heavy metals constitute a major pollution that was contributed to by a variety of sources, such as industrial effluents, leaching out metal ions from the soil, and acid rain. These pollutions pose a serious problem to human health and recreational activities, therefore requiring bioremediation of such toxic metals from our streams, lakes, and soils. Previous studies have shown that some bacterial species tolerate varying levels of heavy metals in their environments. The heavy metal tolerance in bacteria is mediated through spontaneous mutation and selection of mutant in the continuing bacterial culture. Strains of *R. sphaeroides* were continually selected on minimal medium with varying concentrations (0.05, 0.10, 0.25, 0.50, 1.0, 10, 20, 50 and 100 ÂµM) of AuCl3. *R. sphaeroides* was found to tolerate the gold salt up to a 50ÂµM concentration, and no phenotypic difference was observed between the wild type and the selected strain. Strains grown under aerobic and photosynthetic growth conditions were analyzed for reduction of gold in membrane and cytosolic fractions of cells using ICF-Analysis. Gene homologs of previously identified genes involving metal tolerance in Pseudomonas putida were identified in the genome of *R. sphaeroides* and that includes sensor kinases, membrane bound transporters, and genes involved in carotenoid biosynthesis. It is suspected that a number of these genes might have altered expression patterns under selective growth condition, which will be measured by reverse transcriptase polymerase chain reaction (RT-PCR) analysis. Results of the current study will have an array of applications to scavenge heavy metals from polluted environment at a larger scale.

Zombies: the Method to the Monsters

Presenter: Kris Karli

From Dracula and Frankenstein (spawned from xenophobia and fear of science) to the fake profiteering ghosts of *Scooby Doo* that mesmerized hippies, even to the modern sparkly vampires and shambling zombies, every generation has its own monsters. What is most interesting is what each set of monsters says about the zeitgeist, the spirit of the times which spawn them. Oftentimes, one generation's monster is the heartthrob of some future generation or the butt of a joke. The monsters are more than a representation of their fears, but a fulfillment of them; the monsters justified societal fears. With good reason, zombies are the most common modern monster, despite the frustration many feel with their seeming omnipresence in pop culture. What a lot of people do not understand, however, is that the zombie is not the nightmare of the current generations, those most invested in consuming the pop culture. The zombie apocalypse is a last gasp of desperate hope for the previous generation of baby boomers.

Developing a Novel Method for Identifying 2-aminothiazoline-4-carboxylic Acid Using Surface Enhanced Raman Spectroscopy

Presenter: Stephen Lee*

2-aminothiazoline-4-carboxylic acid (ATCA) is a common metabolite formed during cyanide intoxication. Thus, developing a method that can be used to quantify ATCA is attractive for identifying the extent of cyanide poisoning in an individual. One approach is to utilize surface enhanced Raman spectroscopy (SERS), using gold film over nanosphere (FON) substrates. In order to obtain the goal of surface enhancement of ATCA, the home-assembled Raman spectrometer required an increase in signal to noise ratio. Signal to noise ratio issues were addressed in a number of ways including light shielding, exposure time adjustments, and background or substrate subtractions. Once the signal to noise ratio of the Raman spectrometer was addressed, the investigation into ATCA using SERS could be performed. Ideally, ATCA would be covalently bound to the gold molecules of the FON, but ATCA does not have a free thiol with which to bind to gold. Therefore, modification of ATCA using 2-iminothiolane hydrochloride (2-IT) to form a free thiol was pursued. The ATCA and 2-IT were analyzed in situ using the Raman spectrometer to identify their individual spectra and the reaction spectrum. It became apparent that the reaction of ATCA and 2-IT was forming a crystal precipitate; thus, further analysis of the adduct was necessary. Several experiments were performed to characterize the crystals including obtaining a melting point, identifying a solvent, and obtaining both powder and solution spectra of the adduct.

Species-Being and Sexuality

Presenter: Thomas Leger

Human relations are naturally oriented toward the continuation and growth of humanity. For many people, this is only thought of with regard to the sexual act and physical reproduction. However, a Platonic interpretation of relationships shows that the greater fruits are the intellectual and cultural contributions which also stem naturally from interactions with one another. These interactions are instinctual and a part of our own species essential nature, or its species-being, as the theory is expounded by Karl Marx. A Marxist interpretation posits that species-being is not something that is unchanging and fixed, but rather changes in response to reality as it is experienced in material conditions. In response to different circumstances, humanity's species-being is altered. This would also include, among other things, instinctual sexual desires and the economy of human relationships. During periods of poor material conditions (prolonged periods of war, poverty, or disease), our species-being must focus on survival and physical re-population. However, during periods of more savory material conditions (prosperity and peace), when there is no additional threat to humanity, our instincts are less focused on sexual acts that merely reproduce physically, and more on human relationships that supersede this physical level and become oriented toward further advancement in intellectual and cultural endeavors.

Women's Leadership

Presenter: Nayeli Lopez

Women in leadership positions often fail to reach their full potential due to several factors. The factors discussed in this project include the glass ceiling, empowerment, and how culture has an effect on women's leadership. When women take on a role as a leader, they are some times perceived as being aggressive and demanding, rather than assertive and confident. Women should have fairness when it comes to a work place and should be treated the same way a man is treated. This is an ongoing project to create an on-campus women's leadership program in the fall of 2014

The Role of B56-alpha and B56-delta/gamma on Convergent Extension

Presenter: Grayson Means

Wnt cell signaling is an important regulator of vertebrate embryonic development. An important component of this pathway is Protein Phosphatase 2A, which performs different functions within the cell based on the identity of its regulatory or B subunit. Of particular interest to this study are B56Î± and B56Î´/Î³. Previous studies have shown these regulatory subunits are important for canonical Wnt signaling. They regulate Î²-catenin degradation, and by extension, mitosis. However, there has been little research done on the effect these subunits have on the Convergent Extension (CE) portion of Wnt signaling, which is largely responsible for anterior-posterior axis formation during embryonic development. Preliminary evidence suggests that B56Î± and B56Î´/Î³ are also important in the CE pathway, but their exact role is unclear. This study attempts to determine the specific role of these B56 regulatory subunits in the CE portion of the Wnt cell signaling pathway.

Understanding Ventricular Septal Defects in Infants

Presenter: Joshua Miller

In this presentation we will look at a dynamic and steady state model that was created to describe the changes in blood flow for newborns that are born with ventricular septal defects (VSD). This model is modified from the model presented in F.C. Hoppensteadt and C.S. Peskin's book *Mathematics in Medicine and the Life Sciences* by introducing a new flow, Q_e, which uses the simple algebraic properties of compliance and resistance vessels to show how the blood is shunted between the two halves of the heart. There are many factors that affect VSDs, ranging from size, type of hole, and location of the defect, to other mitigating factors, such as chromosomal disorders like Down Syndrome. The model was evaluated to determine parameter values that influence nonlinear blood flow, overall shunt volume, and the factors that control blood flow for ventricular septal defects.

Arthurian Parallels and Reflections in J.R.R. Tolkien's "The Fall of Gondolin"

Presenter: Clinton Morrison

This presentation traces the influence of two monumental Arthurian works on J.R.R. Tolkien's short story "The Fall of Gondolin." I argue that Tolkien self-consciously constructed certain parallels in characterization and structure between his own short story and Thomas Malory's *Morte D'Arthur* (ca. 1476) and Alfred Tennyson's *Idylls of the King* (1859-85) to create a mythology for England (something he would also do later in his *Lord of the Rings* trilogy). I will also discuss some of Tolkien's other stories, including his *Fall of Arthur* and "Lost Road" manuscript, in order to reveal Tolkien's intent to create a shared history between his Middle-earth mythology and Arthurian legend.

The Affordable Care Act: Affordable For Whom?

Presenter: Courtney Nieto

Will the majority of the United States population truly benefit from the Affordable Care Act? The Affordable Care Act is perceived to benefit the majority of citizens who are not insured, but there is evidence that it will hinder citizens as well. I believe it is morally right to help people find health care that will benefit their families and themselves. The Affordable Care Act is a prime example of utilitarianism in our society in that the law has been adopted to help insure the majority of Americans. By fully examining the context of the law, we can witness where some components do not bring satisfaction to all Americans. Jeremy Bentham explains that even if the consequence may cause pain to a few people, as long as the vast majority of people gain pleasure, it is acceptable. Bentham would agree with the Affordable Care Act in that it benefits the majority of people who are uninsured. Additionally, from Stuart Mills's perspective, the Affordable Care Act will lead toward the Great Happiness Principle. As time passes, will utilitarianism prevail over critics who view the Affordable Care Act as not providing adequate protection for all individual rights?

War, Plastic Surgery, and Art

Presenter: Maegan Nolen

During the 20th century, a curious, intertwining relationship between art, war, and plastic surgery emerged. Although not a new practice, plastic surgery underwent a permanent change due to the overwhelming destructiveness of WWI. Prior to this, plastic surgery progressed at a relatively slow pace commensurate with its traditional paternal origins, but modern plastic surgery pushed the boundaries of possibility. Sharing this information is vital to promote awareness of those surgeons who painstakingly brought wrecked faces and bodies some degree of restitution. This research will show the importance of plastic surgery techniques, their fundamental relevance, and the evolution of the profession post WWI.

Saving the Lines

Presenter: Shannan April Paluka

Saving the Nazca Lines in Peru has historically been an elusive task. The Nazca Lines are a series of geoglyphs depicting shapes, animals, and humans. The *Oxford Dictionary* defines a geoglyph as a large-scale image or design produced in the natural landscape by techniques such as aligning rocks or gravel or removing soil or sod, the complete form of which is visible only aerially or at a distance. The massive Nazca Lines, drawn by an indigenous culture over two thousand years ago and brought to global attention in 1927, were finally declared a World Heritage Site by UNESCO in 1994. Renowned German academic Maria Reiche made the preservation of the site her life's work until her death in 1998. In contemporary Peru, an executive branch of government called The Ministry of Culture advocates for the protection of the Lines. Nonetheless, the Nazca Lines are being destroyed. Weather, racism, industry, and government inaction will be discussed as factors threatening the Lines. However, the main argument will be that the mining industry is being allowed to destroy the Nazca Lines because Peru's government profits more from mining than tourism from the site.

The Art of War: Art Theft in Nazi-Occupied France (1940-1944)

Presenter: Erica Peaslee

This paper uses the recent discovery of art in the Munich flat of Cornelius Gurlitt to examine the proliferation of the theft of art, particularly in France, by the Nazi Party during World War II. Focusing on works of art owned by French-Jewish dealers like Paul Rosenberg --some of which were found decades later in Munich-- to guide the audience through seventy-plus years of persecution and restitution issues, I argue that this complex and unresolved mechanism of war is a contemporary reminder of and hindrance to a full recovery from the Holocaust. This paper examines the multi-faceted reasons for theft and uses of art by the Nazi Party, such as culturally Aryanizing Europe and creating universal monetary unit to finance their war efforts, and discusses the contemporary issues that have arisen out of the convoluted and far-reaching actions of the Third Reich. The research presented in this paper is especially relevant now as contemporary Hollywood films and other media outlets are capitalizing on the public's interest in this relatively unknown facet of World War II with material that is less objective and financially, not academically, driven.

Knot Mosaics and Hextiling: Knot Projections Laid Onto Hexagonal Tiles

Presenter: Sarah Renfro

Knot theory is the mathematical study of knot and link properties. A mathematical knot is informally defined to be a "rope" in $\mathbf{R}^3$ that is "tangled", "twisted," and then connected at the ends such that the rope has no beginning or end. To study knots, mathematicians use projections of knots in $\mathbf{R}^2$, preserving the over and under crossings by using breaks in the strands. Louis Kauffman and Samuel Lomonaco recently introduced a new field in knot theory in "Quantum Knots and Mosaics." They define knot mosaics to be knot projections laid onto square tiles. In my presentation, I will expand their definition to hexagonal tiles and compare and contrast hexagonal knot mosaics of Pretzel knots.

Patriarchy and Women in Early Modern Britain

Presenter: Paul Ruiz-Requena

During Britain's early modern period (1485-1800), the successful reign of a female monarch, the participation of women in the English Civil War (1642-1651), and the continued education of upper-class women are sometimes interpreted as signs of positive change in the status of women in British society. Much of the historical and social work looking at patriarchy and the status of women in Britain during the early modern period focuses on the assumption that the social position of women was improving. Basing their research on the increased visibility of women, many of these studies nonetheless tend to lose sight of the patriarchal system that was still very much in control of the lives of women. My research addresses the idea that the opportunities afforded to the most famous women of the early modern period were used not to increase the role or independence of women in British society, but only to bolster the established patriarchal order.

Effects of Gender and Race on Occupational Wages

Presenter: Stephen Sears

This paper analyzes the effects of gender and race on average (median) real wages at the occupational level. Using annual data on wages and employment for 247 occupations from 2003 to 2012 in the U.S., this paper estimates fixed effects panel data models to show that occupations dominated by women, Blacks, and Hispanics have relatively lower mean (median) hourly real wages. In contrast, occupations with predominantly Asian workers have relatively higher mean wages. These results seem to support the discrimination-based theories of gender and racial wage gaps.

An Introduction on Setting to Milton's "Paradise Lost"

Presenter: Jenny Seay

John Milton emphasizes and parallels key themes in his epic poem, *Paradise Lost*, by his description and treatment of the four settings: Hell, Chaos, Paradise, and Heaven. Each of these settings contribute to the story of the hero's journey, his failure, and his hope of redemption. They specifically recreate the journey, while also providing a medium for which the journey takes place, to discuss man's sin and explain certain aspects of Christianity, like the nature of a loving God who punishes with Hell.

Childhood Onset Bipolar: Risks, Attributes, Comorbidities, and Treatments

Presenter: Anne Sergi

Childhood-onset bipolar is a conflicting topic in the psychology world. It is a relatively new idea that individuals under the age of 18 can be affected by bipolar disorder. Childhood onset bipolar, whether prepubescent or adolescent, presents itself differently than classic bipolar disorder. There is little known about childhood bipolar and little medication available to those under the age of 10. The risks of taking medications at such a young age is a controversial topic. We do not know the effects on development, and there is indication of comorbid medical conditions that arise from these medications. The only thing that seems to be known about childhood onset bipolar is that it is a virulent and devastating hereditary disorder. There is more research that needs to be done in this area to provide help with diagnosis and treatment to those afflicted with the condition.

Emotions in Shakespeare's "Othello"

Presenter: Angela Shackelford

For more than four centuries, audiences have enjoyed Shakespearian dramas. The universal appeal, even today, lies in Shakespeare's keen exploration of the role that emotion plays in human vulnerability. Perhaps no other work reflects this insight better than *Othello*. In this tragedy, love digresses into jealousy, hatred inspires violence, insecurity escalates to obsession, and lust deviates to madness. My objective is to consider the causality of emotion and its consequences for each character through an informed discussion of textual examples and authoritative sources on the Bard's work. At the conclusion of my presentation, I hope that I will have offered my audience a greater understanding of Shakespeare's observations about the fragility of the human condition and a broader appreciation of this play, one that extends beyond its racial theme.

Protein Phosphatase 2A Mutations E64G and E64D in Wnt Signaling Pathways of Xenopus Axis Formation

Presenter: Lauren Sommer

Cells communicate with one another in many ways, such as with the Wnt protein. In multiple cancers, specifically colon cancer, the Wnt pathway is deregulated. Protein Phosphatase 2A (PP2A) has been found to function as a tumor suppressor. PP2A is composed of three parts: A, B, and C. One type of B subunit, B56, has been shown to inhibit Wnt signaling. We hypothesize that in cancer, a mutation in the A subunit causes the B56 subunit of PP2A to be inhibited and, therefore, Wnt signaling is increased. Using *Xenopus laevis* as a model organism, two mutated versions of the A subunit found in human cancers, E64G and E64D, will be injected into the embryo. The predicted outcome is that the mutations will inhibit B56 and produce an overexpression of Wnt signaling. The overexpression of Wnt should result in excessive body axis formation and, therefore, development of two-headed embryos. This over proliferation of cells is the basis of tumor formation. Identifying the cause of tumor formation will help in the design of therapeutics that could restore normal PP2A activity.

Religious Identity and Chance in Eugene O'Neill's "The Emperor Jones"

Presenter: Grant Sorrell

This research analyzes symbolism in Eugene O'Neill's *The Emperor Jones* to determine the play's intentions for shaping a view of its protagonist, Brutus Jones, and the world he inhabits. Touching upon a wide range of symbols in the play, including names, clothing, props, colors, scenery, and dialogue, this paper reveals them to be largely religious in nature. However, these religious symbols do not represent a single belief but ambiguously alternate between Christianity and paganism. Invoking the work of John Donne and the Bible, this paper suggests that the array of Christian and pagan symbols underscore the division within Brutus Jones, as well as reveal insight into the author himself, that O'Neill saw African Americans as tragically conflicted between two worlds. Furthermore, this research examines the underlying theme and symbolism of chance throughout the play to show that it serves just as large a role in the formation of personal identity–and may also be responsible for–religious beliefs.

The Necessary Evil of Enforceable Law

Presenter: Levi Stanley

There is not one format of government that all people agree upon. However, an essential aspect of any practical government is the ability to deter detrimental action by its citizens. To ensure the well- being of humankind, there must be enforceable laws that act as deterrents for detrimental actions. This need for law infers that, for the betterment of society, humans must give up certain liberties. A strong counter to my thesis is the philosophy of John Locke, who expressed that submitting ourselves to the laws of an institution strips us of our God-given freedom and subjects us to the tyranny of law. This is an observation on the submission of freedom for the securities of rights; however, this process is a necessary evil in the preservation of humanity's well-being. This moral justification is explained through the political philosophies of Thomas Hobbes and Plato, who both explained how vulnerable humankind would be in the event that there was not an entity to enforce law. In order for people to have peace of mind, they must be able to live in a state of assurance. Without the assurance of law, people could act on their natural sense of self-preservation in ways that would be detrimental to humankind. Through their perspective, a fearful respect of law is desirable because it serves as a functional means of preserving life and property. Without enforceable law, even social contracts could be voided in pursuit of self-interest.

Killer Couples: An Exploration into the Minds of Those who Live, Love and Kill Together

Presenter: Kaeleigh Stengle

Extensive research has been conducted on individual serial killers and the various aspects of their personalities. There is little research, however, on the development of romantically involved individuals who kill together. This research has defined serial killer couples as romantically involved individuals who partake in three or more murders in which each individual plays a specific role in the demise of the victim. There is careful consideration given to childhood influences and cognitive development in each individual and the role that each of these factors plays in the development of the relationship that leads to couples that kill together. Studies of several high-profile cases concerning romantically involved couples have been used to gather information on the development of the individual as well as the development of the couple. Identifying similarities and patterns among couples may help law enforcement in the identification of couples that kill together.

The Effect of Omega-3 Fatty Acids on Joint Inflammation of Young Horses Undergoing Regular Exercise

Presenter: Julia Swyden

Adaptation of bone and soft tissue occurs in early horse training. During this adaptation, young horses undergo repeated trauma and stress that can lead to the over-production of inflammatory eicosanoids. This can cause the onset of osteoarthritis which accounts for approximately 60% of lameness problems in horses, causing early retirement and a decrease in athletic function. Treatment for osteoarthritis at this time is limited and can pose significant health risks. Current research is focused on alleviating pain and other symptoms of the disease. However, more research is required to develop a preventative strategy for this degenerative disease. In this study, young Quarter horses were separated into a control group and a treatment group, with the treatment group receiving a commercially available marine-based n-3 fatty acid supplement. In this on-going study, body weight and plasma samples are collected each week and rump fat is measured ultrasonically every 21 days. Dietary strategies including n-3 fatty acids have the potential to mitigate early inflammation associated with exercise. Being that osteoarthritis is a degenerative condition and that exercise is a major risk factor for developing the disease, this dietary study conducted in young exercising horses has the potential to yield significant results in the prevention of osteoarthritis.

In Vivo Construction of RecA Mutant in Rhodobacter sphaeroides 2.4.1

Presenter: Travis Tate*

The recA gene encodes for the RecA enzyme, a DNA-dependent ATPase, which is vital for homologous recombination during the cell cycle. Additionally, RecA assists in the mediation of the SOS response by inducing autoproteolysis of the LexA repressor and regulates error-prone DNA synthesis that bypasses DNA lesions. Since the function of RecA is linked to important cellular function, it is hypothesized that RecA plays a critical role in the survival of *Rhodobacter sphaeroides*. To test this hypothesis, an in vitro recA deletion was constructed and the resulting plasmid was used to replace the wild-type recA gene in *R. sphaeroides* 2.4.1. To perform the in-frame deletion, two pairs of PCR primers were designed to produce two PCR products containing corresponding 3– and 5– flanking segments of the recA gene. A recA deletion allele was constructed through the fusion of these complementary fragments using a subsequent round of PCR, which utilizes primers with overhang regions. The fusion product was then cloned into a suicide vector (pLO1). The recombinant plasmid was cloned in E. coli DH5Î± cells, used to transform E. coli S17-1 cells, and then mobilized from E. coli S17-1 donor cells to *R. sphaeroides* 2.4.1 cells using a standard bacterial conjugation method. The resulting exconjugants were selected for a single crossover event using a minimal media with kimommicin and then slected for a double crossover event using an enriched media with 15% sucrose. The gene replacement was confirmed using PCR and subsequently DNA sequencing. Since the recA gene and its homologs are conserved across all bacterial species, impairing the homologous recombination function in *R. sphaeroides* 2.4.1 would allow this bacterium to be used as a key biotechnological tool for maintaining the heterologous genes in *R. sphaeroides* 2.4.1.

Mysterious Owls and Political Discussions

Presenter: Shirley Tey

I hypothesize that strong/highly mysterious individuals will participate and interact in in-classroom political discussions less than weak mysterious (open) individuals. By utilizing survey data collected on the SHSU campus from students enrolled in Professor Stacy Ulbig's POLS 2301: Introduction to American Government class in Fall 2013, I investigate the ways in which mysteriousness affects participation in classroom political discussions. According to my findings, and reinforcing my hypothesis, individuals who are more mysterious participating in classroom political discussions at a lower rate than those who are classified as weak mysterious (open) individuals. With these findings, it is a fact that one can be 95% sure that the relationship here holds for the population. These findings can help explain the low political discussion participation rate in Professor Stacy Ulbig's class. Beyond the classroom, these findings can help explain the decrease in local voter turnout.

Expression of B56 in the embryonic gut of Xenopus Laevis

Presenter: Raymond Torrecampo*

Cell communication is important in development, and the Wnt proteins are important for this cell communication. Cell communication using the Wnt signaling pathway can become deregulated, and can result in many diseases. Wnt plays a role in intestinal development, and one of the most dangerous diseases correlated with defects in the Wnt pathway is colon cancer. Colon cancer is the second leading cause of cancer- related deaths in the United States, so it is important to understand where and when deregulation in the Wnt pathway takes place. Our protein of interest is protein phosphatase 2A (PP2A), a tumor suppressor composed of an A, B, and C subunit, which regulates Wnt signaling. We hypothesize that A subunits undergo a loss-of-function mutation that prevents it from binding our B subunit of interest, B56, thus inhibiting its tumor suppressor function. Our proposed project is to observe the spatiotemporal expression pattern of B56 during intestinal development. For this project we will be looking at 3-, 5-, and 7-day-old embryos of the frog *Xenopus laevis*, an excellent model organism who has applications in embryonic development and cell signaling. The B56 subunit in the frog is nearly identical to B56 in humans, so any significant findings made during this project will have significance for colon cancer in humans. If we are able to observe expression of this protein, this will give us an idea of how PP2A: B56 regulates Wnt during intestinal development and, therefore, also how it regulates Wnt in adult colon.

PTSD and its Victims: Military Attribute to Solving Potential Hazards Outside of the Combat Zone

Presenter: Hope Townsend

The purpose of this paper is to introduce the signs and symptoms of Post-Traumatic Stress Disorder (PTSD). The targeted population chosen for this project was military personnel, and the reason for this discussion is to simplify the magnitude of what occurs post-combat duty. Suggestions have been made that there should be a greater transition from a combat-effective mind frame back into the civilianized world. Nevertheless, all of the factors that contribute to the repercussions of what soldiers faced during combat do not end when they return home. Some of the lessons about PTSD are unfortunately learned the hard way, and it is intended that there should be more of an understanding, not only from a civilian standpoint, but also from intel to help transition those who have chosen to protect this great nation.

Confronting Politics: Exploring How Personal Confrontational Levels Affect Engagement in Political Discussion

Presenter: Elizabeth Turner

In my research, I hypothesize that individuals with higher confrontational levels will engage in political discussions within their immediate social groups more frequently than less confrontational individuals. Using survey data collected from SHSU students enrolled in Introduction to American Government during Fall 2013, I explore the ways in which personal confrontational levels affect one's participation in political discussion. As anticipated, I found that individuals who identify as more confrontational engage in political discussion with their social groups more often than less confrontational persons. These findings can help expand the reach of political influence by mobilizing confrontational individuals.

Thomas Jefferson: A Man of Paradoxical Views Regarding Slavery

Presented by: Janeane Ward

There were many important leaders who played a role in the establishment of the United States; however, one man stands out significantly—Thomas Jefferson. Historians have found Jefferson to be a fascinating subject due to his vast accomplishments such as crafting the Declaration of Independence, serving as Secretary of State, later as Vice President and then, ultimately, as the third Commander-in-Chief of the United States. While we admire the great accomplishments that Jefferson achieved, many historians consider him to be a rather complex individual, especially in regard to his position on slavery. This project will examine the life of Thomas Jefferson, and it will analyze the views that he had regarding the institution of slavery and his fears of what would become of the south if the slaves were set free. It will also show how his financial situation and racist attitudes towards blacks prevented him from freeing his slaves.

The Incremental Validity of Neuropsychological Testing for Foster Children

Presenter: Jason Wesson*

Neuropsychology is the study of brain-behavior relationships. In addition to determining pathological from non-pathological states, neuropsychological testing is widely used in education, rehabilitation, and outpatient psychological practice. Children placed in the foster care system are frequently evaluated with neuropsychological measures in order to provide a more detailed understanding of their cognitive strengths and limitations. These costly assessments appear to hold heuristic value for understanding a child's needs, yet the incremental validity (i.e., the extent to which these assessments add to our understanding above other measures and assessments) is unknown. The current study proposes to examine the incremental validity of neuropsychological assessment in a group of children who have been placed in the foster care system. Researchers will administer neuropsychological measures typically used in clinical practice and provide feedback to approximately 25 families. After six months, researchers will follow-up with these families to evaluate each child's current functioning in school and home settings. This information will be compared to a similar group who received only a general psychological evaluation. It is hypothesized that families who received a more thorough evaluation will indicate a better long-term understanding of their child's functioning and feel better equipped to handle difficult behaviors and educational needs.

The Evolution of Evil

Presenter: Tiffany Young

This presentation focuses on the evolution of the archetypal vampire, whose stories can be found throughout history in almost every region of the world. This paper traces the history and development of the vampire tradition, starting with folklore of the spirits and deities who took blood or life essence and progressing through society's development of technology and changes in societal outlooks and religion. Universal persistence and significance suggests there are deep roots in our psyche's evolution, as images of the vampire have changed from an evil creature to a romantic, sexy, and desirable supernatural being that enchants us and inflames our hunger for their dark sensual immortality and mortal transcendence.

A Gay Girl in Damascus

Presenters: Walter Bauer, Benjamin Bigham, Angela Wood

History is replete with examples of *nom de plume* authors, including Lewis Carroll, George Orwell, and George Eliot, to name a few. Eighteenth- and nineteenth-century English and French literature includes a multitude of gender-switching authors. In the early twentieth century, "ethnic transvestites" emerged. It entailed an author challenging the conventions of racial, gender, or sexual authority by assuming a new ethnic, gender, or sexual identity as a way to bolster narrative authority. Recently, Tom MacMasters was able to masquerade as a Sunni female lesbian blogger from Syria. In effect, he created a "sock puppet" intent on amplifying his own propaganda. He also created a Syrian-American woman in her mid-twenties who blogged about the Arab Spring, the LGBT community, "pinkwashing", her Sunni faith, and Orientalism. He used a lesbian Syrian woman to claim narrative authority. Using Amina, he attempted to speak to the West about the general consensus amongst Arabs concerning "pinkwashing", orientalism, LGBT rights, the Arab Spring, and internal events in Syria.

PPE Gene Family Members in Non-Mycobacterial Species

Presenter: Chelcy Brumlow*

Mycobacterium, genus of bacteria with over 80 species, some of which are environmental and some are infectious to humans and other animals. One major question in microbiology is how do pathogenic bacteria evolve? One part of the pathogenic evolution of Mycobacterium includes acquiring a gene family known as PE-PPE. This gene family is known to contribute to antigen variation through modifying cell-surface proteins allowing Mycobacterium species to evade a host's immune system for a prolonged period of time. However, the PE-PPE gene family has also been found in other, non-Mycobacterium genera in which the functions are not yet known. The presence of this gene family outside of Mycobacterium allows for pathogenic evolution of this species to be studied and the functions of this gene family to be questioned in other genera. Bioinformatics was used to test the hypothesis that during the pathogenic evolution of Mycobacteria, the PE-PPE gene family was acquired through genetic transfer mechanisms from non-Mycobacterium species in which it originated.

Description of the Cranial Anatomy of Gehyra mutilata Using High Resolution Micro-CT

Presenters: Zecariah Carroll, Tonya Parnell, Skylar Shrum, Lee Tracy*

Gehyra mutilata is one of the 38 species within the genus Gehyra, within the family Gekkonidae, that includes the most diverse radiation of geckos. This species, originally derived from the Philippines, is found in Southeast Asia and many insular areas in the Indian Ocean (including Madagascar) and the South Pacific Ocean. This species of geckos is commonly found in man-made structures within these regions. A detailed description of the cranial morphology and mandible of a specimen collected in Palau is presented here based on data collected using High Resolution X-ray Computed Tomography (HRXCT). The bones of the skull will be isolated using the 3D analysis software Amira in order to provide a detailed osteological description of the skull.

Sequence Comparisons of Aurora Kinase Homologs in Rhodobacter sphaeroides

Presenter: Zechariah Carroll*

The Aurora Kinases, a family of serine/threonine kinases, have been associated with a variety of essential cellular functions involving coordinated chromosomal segregation during nuclear division in eukaryotes. Several taxonomic lineages within Animalia and Plantae have been shown to have up to three homologs of the Aurora kinase family. Previous studies have shown that the C-terminus of Aurora kinase is highly conserved across Eukarya, while the N-terminus demonstrates species-specificity. The consensus sequence of the conserved C-terminus regions of the Aurora kinases within Eukarya was used to find homologs within the bacterial and archaeal genomes stored in the NCBI database. A total of 310 bacterial and 132 archaeal species were found to contain serine/threonine kinase genes with significant homology to Aurora kinase. Since many of these prokaryotic organisms, including *Rhodobacter sphaeroides*, possess multiple chromosomes, the Aurora kinase homolog is suspected to play a role in cell-cycle regulation. Two open-reading frames, RSP_3475 and RSP_3134, were identified in *R. sphaeroides'* genome, each identifying with human Aurora A and B, respectively. The goal of this study is to perform a gene knockout on these two *R. sphaeroides* genes in order to further understand their possible roles in prokaryotes.

The Narcissist and the Ruler

Presenter: Zakiya Carter

This presentation focuses on narcissism and politics. Specifically, I hypothesized that individuals with higher narcissism will be more likely to run for political office than those with lower narcissism. Using the data collected from a Fall 2013 survey of freshmen at SHSU, I examined whether narcissistic tendencies have an effect on a person's likelihood to run for political office. Unexpectedly, my results show that there is no statistically significant relationship between narcissism and an individual's likelihood to run for political office. Therefore, measuring a person's narcissistic tendencies does not help predict whether or not she or he will run for a political office.

Profiling Cyber-Criminals: Feasibility and Practicality

Presenter: Trey Cawley

The current study seeks to answer the question "can cyber-criminals be profiled?" Through a secondary analysis of previous literature, the researcher establishes the current thought on criminal profiling as applied to cyber-criminals. Also, through a survey method of ten InfraGard members, the actual usefulness to professionals of a profile is assessed along with their ideas of what types of offenses count as cyber-crimes. Through this mixed method of inquiry, the researcher will answer this question with the expected outcome being that cyber-criminals are roughly comparable to other categories of criminals, such as serial killers or stalkers. In other words, they have observable patterns of behavior that can be profiled and applied by professionals to help in their investigations and preventative measures that they implement. This study has serious implications for various professionals inside the cyber-security, homeland security, and information technology fields in that it hopes to spark interest in a psychological answer to what is seen as a primarily technological problem.

Antibiotics as Both Beneficial and Disruptive

Presenter: Oscar Chavez*

The use of antibiotics is still the primary method to treat and cure bacterial infections. The relatively inexpensive price of antibiotics has also encouraged their wide use in the medical field. But the indiscriminate use of antibiotics has resulted in the unintended rise of antibiotic-resistant bacteria. Animals are normally covered with large numbers of bacteria, many having beneficial effects for the host. This normal microbiome can also be affected by antibiotics. Using a model system, we will expose fish to antibiotic treatment. The microbiome from the skin will be extracted before, during, and after the treatment. We expect to see that while the total number of microbes recovers quickly during treatment, the composition of different bacterial species will be strongly altered. Using multiple antibiotics should lower the emergence of drug resistant bacteria, but also should disrupt the normal microbiome even more. Antibiotics play valuable roles in medicine, but have negative effects along with the benefits.

Seeing Red: Effect of Color on Attractiveness Ratings and Memory

Presenters: Tara Cobler & Rhett Cooper

The color red has had many different meanings and contexts throughout history. A few psychological studies have found that men rate female faces on red backgrounds as more attractive than faces on other colored background, and that the more attractive a face is, the more memorable it is. The present study investigated whether women would also rate men on red backgrounds more attractive than men on other colored backgrounds, and if faces on red backgrounds would be remembered better than faces on other background colors. The results, implications, and potential applications of this study will be discussed to shed light on how color affects attractiveness, perception, and memory.

What Emphasis Does a Foreign Language have on Federal Criminal Justice Seekers?

Presenter: Stefany Cornejo

Everyone knows a second language is always a competitive edge for any career and especially for federal career seekers. However, what does learning learn a second language entail? What importance does it have for a federal criminal justice professional? What is the career outlook? My research analyzes how a second language contributes skills and qualifications that are in high demand for current and future federal criminal justice professionals. Since the tragic events of September 11, 2001, there has been a spike in the need for foreign language and culture skills for those in careers combating crime. Thus, linguists, translators, and interpreters are in high demand. Moreover, cross-cultural expertise in the field is developing unprecedented opportunities for cooperation in our global age. Foreign language departments train students to critically analyze language and culture; both skills are crucial for the challenges that future criminal justice professionals are likely to encounter. The federal criminal justice field is searching for individuals that can process and interpret vital data to overcome such challenges. There are many federal careers that are specifically looking for culture and language skills.

Characterizations of Antimicrobial Resistance Phenotypes in Salmonella enterica Human Isolates

Presenter: Dawn Fisher*

Salmonella enterica is gram negative bacteria that causes 42,000 cases of salmonellosis every year in the United States. Salmonellosis causes diarrhea, fever, abdominal cramps, and some cases can end in death. Severe salmonellosis is treated with antimicrobial agents; with the rise of antimicrobial resistance, this treatment is becoming problematic. To assess the level of antimicrobial resistance, 96 *Salmonella enterica serovar Typhimurium* and 50 serovar Heidelberg human clinical isolates obtained from Texas Department of Health, were tested for antibiotic resistance by disk diffusion method. The classes of antibiotics tested were cell wall inhibitors, protein synthesis inhibitors, DNA synthesis inhibitor, and folic acid synthesis inhibitor. *S. enterica serovar Typhimurium* was resistant to 4.097% of cell wall inhibitor, 6.944% of protein synthesis inhibitor, 0% of DNA synthesis inhibitor, and 1.806% of folic acid synthesis inhibitor. *S. enterica serovar* Heidelberg was resistant to 5.6% of cell wall synthesis inhibitor, 9.067% of protein synthesis inhibitor, 0% of DNA synthesis inhibitor, and 1.733% of folic acid synthesis inhibitor. While the overall level of resistance was low for both serovars, long-term surveillance is needed to determine if the resistance trends are on the rise.

Developing a New Vaccine Using Zombie Bacteria

Presenter: Corbett French

Ever since the invention of the microscope in the late 1500s and the later discovery of bacteria by Anton van Leeuwenhoek (1632-1723), we have been learning more about the importance and dangers of microorganisms. Vaccinations proved to be a meaningful method to combat our loses to illnesses such as smallpox. Though there are historical records of attempts to vaccinate with varying success from China and India, it was not until the 1700s that people began to understand how these illnesses worked and learned that they could use dead, weakened, or closely related strains of bacteria as vaccines to trigger the immune system. I seek to create a new vaccine against the bacteria *Edwardsiella ictaluri* which is not virulent to humans but is fatal to fish and disrupts fish farming operations. Using a model organism fish in the lab called *Gambusia affinis* (western mosquito fish), we have determined that fish can have a partial acquired immunity. We did this by infecting the fish, treating them with antibiotics to kill the bacteria, resting them, and re-infecting the treated fish as well as fish that had not been treated. The treated fish survived longer. I wish to create a vaccine wherin instead of weakening or killing the bacteria, I will zombify them. Exposing the bacteria to 15,000 kJ/cm-squared UV radiation will render the bacteria incapable of replicating, though they remain alive. I hypothesize that if we expose the fish to the zombified, yet still alive bacteria, they should create an immune response without overtaking killing the fish. Later, infecting the fish with real bacteria, we should observe a longer time period before the death of the fish.

Social Physique Anxiety: Does Personality Play a Bigger Role Than We Think?

Presenter: Jessica Graham*

College students are trying to find their direction in their transition to adulthood, and one way that they do this is through changing physical characteristics. Sometimes this attempt at control can turn into an addiction. This study will primarily investigate a positive relationship between Social Physique Anxiety and the frequency of compulsive exercise. It will also address exploratory research questions, including particular personality traits, such as neuroticism or extroversion that are more prone to these compulsions. It is expected that calorie restriction will be positively correlated with Social Physique Anxiety. This study takes Social Physique Anxiety from an addiction perspective. Those who are neurotic and extroverts tend to be more prone to addictions and their social interactions (Griffiths, Gjertsen, Krossbakken, & Kvam, 2013). Data will be collected through objective Actical data and subjective self-report measures from physically active college students. Through the use of food diaries, the Harris-Benedict and calories consumed will be monitored. The predicted outcome of this study is that Social Physique Anxiety will be positively correlated with the frequency of compulsive exercise and calorie restriction. In addition, extroversion will be the strongest personality trait to be correlated with Social Physique Anxiety.

Atlas Day Gecko

Presenter: Scarlett Gutierrez, Jacy Harrison, & Kala Williams*

Quedenfeldia trachyblepharus also known as the Atlas Day is endemic in the southwestern part of Morocco, where it spends most of its time in the Taukbal Massif and the surrounding mountainous areas. It is joined in this area by the only other species in its genus, Quednefeldtia Moerens. The Atlas Day Gecko is a nearly threatened species in this area, though there does not seem to be any major threats as of right now. In this species, it has been observed that the male and female counterparts look very different; the females are dark in color and tend to have stripes on their backs, while the males are usually paler and have either red or brown spots that show up along their necks and down their sides. This species is known to be diurnal and spends its days in the rocks looking for insects to prey on using observation or its chemical senses. There are very few known details about the anatomical description of skull morphology. We provide a description of the skull based on a specimen that was scanned using high resolution computed tomography (CT). The program Amira was used to isolate each bone so that a description of the skull as a whole could be made. This will give us more insight on how this animal may eat and other clues as to how this species lives.

Skull-ornamentation Among Cross Geckos (Gekkota: Squamata: Reptilia)

Presenter: Kortney Hanson

The generalization that gecko lizards have smooth cranial bones has been widely accepted, but a recent revision of the skull of the Gekkota (Daza, 2008) indicates that geckos present an assortment of ornamentation patterns. In this project, systematic surface observations of the individual bones that make up the gecko skull are taken. So far, we have detected at least four different types of patterns, and the preliminary results indicate that although there are a large number of genera with smooth skull bones, such as *Eublepharis macularius*, there are numerous lizards with a pitted or bumpy surface, in this case the *Chondrodactylus angulifer*. We are evaluating these dermal ornamentations by looking at High-Resolution X-ray Computed Tomography and museum skeletons. Of the 118 genera described, we have observations for over 65% of them. The next step in this project will be to map all the information gathered into a phylogeny to better understand the distribution of these cranial features across geckos.

In-vivo Construction of recA Mutant in Rhodobacter sphaeroides

Presenter: Michelle Harrel*

The recA gene encodes for the RecA enzyme, a DNA-dependent ATPase, which is vital for homologous recombination during the cell cycle. RecA also assists in the mediation of the SOS response by inducing autoproteolysis of the LexA repressor, and regulates error-prone DNA synthesis that bypasses DNA lesions. Since the function of RecA is linked to important cellular function, it is hypothesized that RecA plays a critical role for the survival of *Rhodobacter sphaeroides*. To test this hypothesis, an *in-vitro* recA deletion was constructed and the resulting plasmid was used to replace the wild-type recA gene in *R. sphaeroides*. To perform the in-frame deletion, two pairs of PCR primers were designed to produce two PCR products containing corresponding 3 and 5 flanking segments of the recA gene. A recA deletion allele was constructed through the fusion of these complementary fragments using a subsequent round of PCR, which utilizes primers with overhang regions. The fusion product was then cloned into the suicide vector (pLO1). The recombinant plasmid was mobilized from *E. coli* donor cells to *R. sphaeroides* cells using a standard bacterial conjugation method. The resulting exconjugants were grown in liquid culture and plated on LB agar containing 15% sucrose, which selects for a double crossover event that allows for the replacement of the wild-type recA gene by the deletion allele. The gene replacement was confirmed using PCR and subsequently DNA sequencing. Since the recA gene and its homologs are conserved across all bacterial species, impairing the homologous recombination function in *R. sphaeroides* would allow this bacterium to be used as a key biotechnological tool for maintaining the heterologous genes in *R. sphaeroides*.

A Description of the Cranial Anatomy of the Tibet Bent-Toed Gecko, Cyrtodactylus tibetanus (Gekkonidae: Gekkota), Using High Resolution Micro-CT

Presenters: Kaylin Henson, Courtney Miller, & Sarah Mohammed

The genus Cyrtodactylus is comprised of 174 Asian-Pacific gecko species and are commonly known as bent-toed geckos or bow-fingered geckos. This genus is very diverse, and new species within this clade are continually being discovered. Their vernacular name makes reference to their slender curved toes instead of dilated digits like in many other pad-bearing geckos. The Tibet bent-toed gecko (*Cyrtodactylus tibetanus*) was originally described within the genus Alsophylax by George Albert Boulenger in 1905, a Belgian-British zoologist. We reveal the first 3-dimensional model of its skull and a preliminary anatomical description using High Resolution X-ray Computed Tomography (HRXCT) of a specimen collected from the Autonomous Region, China, 41.6 km west of Nang Xian on the Lhasa-Mainling Road.

Straight From the Peanut Gallery: Consolidation and Concentration in the U.S. Peanut Industry

Presenters: Honora Jackson Roe, Kathryn Weber*

U.S. agriculture experienced revolutionary changes in the 20th century. Many scholars refer to this transformation as the industrialization of agriculture. Innovation and the application of new technology propelled U.S. agriculture from the classic pastoral model to an industrial model. As a result, consolidation (the merger of two or more firms) and concentration (the number of firms in a market and their respective market shares) occurred in multiple sectors. Though numerous articles reference measurable changes among the various agriculture commodity sectors, little information exists for the U.S. peanut industry. Therefore, the purpose of this study was to determine if consolidation and concentration had occurred in the U.S. peanut industry and if so, what their implications were. Concentration was calculated using the four firm concentration ratio and the Herfindahl-Hirschman Index. These calculations demonstrated that among the production, shelling, and manufacturing sectors of the peanut industry, shelling and manufacturing were concentrated with both expressing an oligopolistic market structure. Consequently, these two sectors possess greater market power compared to the production sector and, therefore, more control over pricing. This has the potential to put producers at a marketing disadvantage.

MicroCT of Uroplatus phantasticus Brain

Presenter: Devon Kooi

Endocasts are commonly used to model the brain of small animals in which dissections would damage the tissue. An alternative method of modeling is to use a CT scan to model the tissue in situ with no damage. A *Uroplatus phantasticus* skull was differentially stained using modified techniques. A modification of the standard microCT method was used to gather data. The images were produced were compiled using Amira software to create 3D models of the brain tissue *in situ*.

A Description of the Cranial Anatomy of Kuroiwa's Ground Gecko, Goniurosaurus kuroiwae (Eublepharidae: Gekkota), Using High Resolution Micro-CT

Presenters: Michelle Labbe, Danielle Moore, Christopher Wilson*

The gecko genus Goniurosaurus contains 14 species, and as a genus, has an Asiatic distribution ranging from China and Japan south to Vietnam. Kuroiwa's Ground Gecko, *Goniurosaurus kuroiwae*, is an IUCN Red List endangered species restricted to several islands of the central part of the Ryukyu Archipelago of Japan. Reference to the osteology of this genus is rare in literature and has only been studied in the context of eublepharid relationships, as the result of archaeological surveys on Yoronjima Island. Therefore, a complete morphological description of the cranial elements is necessary. Here, we provide a detailed cranial osteology description for G. kuroiwae based on High Resolution X-ray Computed Tomography (HRXCT) imagery from one specimen from Okinawajima Island.

Restoring the Natural Balance of Bacteria to Prevent Drug Resistance

Presenter: Brandon Langle

The use of antibiotics in humans disturbs the commensal and symbiotic organisms in the gut, often killing many types of these beneficial bacteria. The use of probiotic supplements in the human gastrointestinal tract after use of antibiotics could replace many of the killed bacteria and return normalcy to the microbiome. The mucosal layers of fish skins on *Gambusia affinis* are similar in many ways to the gut of humans, so they may be used as a model microbiome for the human gut microbiome to study the effects of antibiotic exposure and the application of probiotics. After exposing mosquito fish to rifampicin in artificial pond water for three days, probiotic culture grown in broth inoculated from non-antibiotic exposed fish skin was applied to the tanks of the recovering fish. Fish skin microbiome samples were taken from fish throughout the experiment to plate on rifampicin nutrient agar plates and nutrient agar plates, and the biochemical capabilities of the microbiomes were also assessed with API-20E test strips. The probiotic will be assessed for its ability to decrease the prevalence of antibiotic resistance, return preexisting biochemical capabilities to the microbiome, and return normal concentrations of bacteria onto the fish skin.

Use of synthetic and garlic sulfur donors to treat cyanide intoxication

Presenters: Justin Lucio, Marla Shifflet, & Elexis Stephens

The reaction of a sulfur donor (SD) and cyanide (CN) to produce the less toxic thiocyanate (SCN) is one of the major mechanisms the body uses to eliminate CN. A current CN poisoning antidote kit uses sodium thiosulfate (TS) as a SD to form SCN. However, this method provides little protection due to the high rhodanese dependence and low mitochondrial membrane permeability to reach endogenous rhodanese, and low SCN formation efficacy by TS. Thus, three new SDs were tested and compared to TS for *in vitro* efficacy, drug formulation, and *in vivo* efficacy. All three SDs exhibited excellent in vitro efficacy of converting CN into SCN, demonstrating a significantly higher efficacy than TS. The *in vitro* efficacy of the SDs was tested using serial plate dilution and spectrophotometric methods. Additionally, since the SDs are highly lipophilic they required specific formulations in order to reduce the injection volume for the *in vivo* efficacy studies. Using a number of different FDA approved surfactant and co-solvent combinations, optimal formulations were developed in order to dissolve the required amount of SDs. Finally, the SDs were tested for their *in vivo* efficacy compared to TS. CN was injected subcutaneously into CD1 white mice at different doses to identify its LD50; a second LD50 was determined by injecting mice with CN prior to the test SD administration intramuscularly. The average potency ratio (APR) was calculated by dividing the LD50 of CN with a test SD by the LD50 of CN alone. The APR for each of the SDs was over three, meaning that they all provide at least three times LD50 therapeutic antidotal protection against CN. The therapeutic protections with the test SDs are significantly higher, over two times higher than with TS.

Does Urbanization Explain Preferential Use of Alarm Calls by Carolina Wrens, Thryothorus ludovicianus?

Presenter: Michelle Mullan*

Habitat loss, anthropogenic noise, and other human effects have placed selection pressures on auditory signaling of animals. Many studies have examined geographic variations of bird songs between urban and rural environments. However, few studies have examined the effects of urbanization on avian alarm calling. Preferential use of alarm calls by Carolina Wrens, *Thryothorus ludovicianus*, has been observed in urban and rural locations of Huntsville, Texas. Those inhabiting urban areas tend to use cheer calls, while those of the rural biological field station of Sam Houston State University tend to use ti-dink calls. We hypothesized that habitat plays a role in their preferential use of alarm calls. Therefore, we predicted Carolina Wrens of other urban environments would use cheer calls and those of rural environments would use ti-dink calls. To test this, we surveyed urban and rural locations of Huntsville as well as three surrounding cities and documented the approximate locations using Google Maps. The results indicated that a geographic variation exists in the alarm calling of Carolina Wren, but the hypothesis was not supported. While cheers were slightly more prevalent in urban areas and ti-dinks slightly more prevalent in rural areas, there was no statistical support of the data.

Identification of a P53-like Protein in Chlamydomonas reinhardtii

Presenter: Bridget Munezero*

Chlamydomonas reinhardtii programmed cell death (PCD) is a fundamental process that is defined by the genetically controlled breakdown of a cell, typically in response to stress. Apoptosis is a well-studied form of PCD and is specific to metazoans. Organisms other than metazoans, including unicellular eukaryotes and prokaryotes, have also been observed to show hallmarks of PCD in response to stress. However, the extent to which these pathways are conserved between unicellular organisms and metazoans has yet to be elucidated. In metazoans, a protein called p53 has a central role in the execution of apoptosis as well as in cell cycle regulation. We tested the hypothesis that Chlamydomonas reinhardtti also contains a p53-like protein. Western blotting was performed using six different anti-mammalian p53 antibodies to determine whether or not any of the p53 antibodies cross-reacts with a Chlamydomonas protein. Three of the six antibodies (Ab-1, Ab-3, and Ab-6) cross-reacted with a Chlamydomonas protein of approximately 53 kD in size. All of the anti-p53 monoclonal peptide antibodies were generated using separate, highly conserved domains of mammalian p53, suggesting the positive result in Chlamydomonas is specific. In addition, Western blotting of 5-20% sucrose gradient fractions of Chlamydomonas protein revealed that p53 settles toward the bottom of the sucrose gradient, suggesting it is part of a larger protein complex. This is consistent with the known tetramerization of p53 in mammalian systems. Immunoprecipitation experiments are currently underway to isolate the 53 kD Chlamydomonas protein. This will be followed by SDS-PAGE and mass spectrometry to determine the amino acid sequence of the protein and test for homology to mammalian p53.

Replicon Typing of Salmonella enterica serovar Typhimurium Human Clinical Isolates

Presenter: Afifa Perkins

Bacterial plasmids are extrachromosomal DNA that carry genes that are inessential to the life of the bacteria, but that can often provide an advantage to its survival and to its ability to cause disease. Plasmids can be classified and thus identified by their replicon type. Many different plasmid replicons exist and can be screened for, but of high interest are Inc A/C and Inc FIB plasmids due to the antimicrobial resistance genes and virulence factor genes they respectively carry. *Salmonella enterica* is a pathogen associated with a large number of food-borne illnesses and often carries large transmissible plasmids encoding antimicrobial resistance and virulence genes. In this experiment, 96 human isolates of *S. enterica serovar Typhimurium* were acquired from the Texas Department of Health and were screened via PCR for 18 replicon types (B/O, FIC, A/C, P, T, K/B, W, FIIA, FIA, FIB, Y, I1, Frep, X, HI1, N, HI2, and L/M). Results were analyzed using agarose gel electrophoresis. Inc A/C, P, and Frep were detected in low amounts. Inc FIA, X, and HI1 were also detected, in slightly higher amounts. These results indicate that a variety of plasmids were found in *Salmonella enterica serovar Typhimurium* from human sources in Texas. Future work would include characterizing plasmids antimicrobial resistance or virulence gene content.

Molecular Community Analysis of the Microbiome

Presenter: John Pinard*

Microbial communities infest every tissue of animals. Either in mutualism or parasitism, microbiota are a part of natural bodily functions. Digestion, metabolism, and immunity are some of the highest sects of study for bacterial research. Generating a complete understanding of all the bacteria present on an animal, how stable the community is over time, and how the community responds to disturbances may lead to new therapies and diagnostics. My study will get a genetic fingerprint of the dermal microbiome of *Gambusia affinis* using a fast and culture-independent method. With my study, I will use Ribosomal Intergenic Spacer Analysis (RISA) to identify the unique banding pattern of the DNA between the 16S and 23S sequences (this region is variable amongst bacteria) of the microbial community on the dermal tissue of *Gambusia affinis*. The advantages of doing RISA is that it is an independnt culture and intricate differences can be seen among the whole bacterial community. RISA does not give exact identification of individual species but gives a pattern that represents the entire community composition. In turn, RISA can provide a faster more effective way of evaluating bacterial communities to advance veterinary and human medicine.

Variation in the Mandible of Zygapsis (Squamata: Amphisbanidae)

Presenter: Lori Ramagali*

in this study, we examined two species of legless lizards using high resolution X-ray computed tomography (HRXCT) to determine if there was variation in boney anatomy of the lower jaw. The two species are *Zygaspis niger* and *Zygaspis quadrifrons*, squamate reptiles that are part of the family Amphisbanidae. These southern Africa species are very small (skull 4 to 5 mm) and delicate, making the use of a nondestructive method like HRXCT ideal. We examined two specimens of each species, with the analysis limited to elements on the right side for standardization. Our goal was to determine what characters varied in the four bones of the mandible: the compound, dentary, angular and coronoid. Preliminary results suggest several characters with interspecific variation, such as overall element shape and the number of mental foramina in the dentary. In addition, there is a significant difference in anatomical size and number of teeth present.

Ecomorphology in the Spaerodactyl Geckos

Presenter: Veronica Rodriguez*

Sphaerodactyl geckos are a group of diurnal animals that dwell in the leaf-litter. They are present in a Circum-Caribbean distribution and include the smallest amniotes known. Sizes range in the group from 16 to 65 mm Snout-Vent Length. The group is very specious (166 spp.), comprising of more than 10% of the gecko species of the world. They are classified in five genera: Chatogekko, Coleodactylus, Lepidoblepharis, Gonatodes, Pseudogonatodes, and Sphaerodactylus. The morphological diversity of the group has been described before in terms of integumentary differences (scale counts) and coloration, but the overall body form has been assumed constant. Based on previous observations and osteological descriptions, we suspect that there is a great variation in the head shape, especially in the snout. In order to test these observations, we performed measurements on the skulls of these geckos (skull length, snout width and length, and snout area) using the computer program ImageJ 1.47v. We used digital X-Rays from XX of specimens, including representatives from every genus. We discovered that there are some morphological differences in the snout variation. This being said, we questioned if these differences can be due to their geographical distribution or size. Our results indicate that their snout morphological disparity might be due to adjustments in their niches, and in the big picture we have discovered at least two big patterns, one where species are have broad and short snouts and another where their snouts are long and slender. We hope to continue working on this project and gather more data from all known species to understand better the morphological variation in these geckos.

Chia: Ancient Crop, Modern Commodity

Presenter: Paul Ruiz-Requena

Native to the agricultural regions of Central Mexico, chia is a plant that produces highly nutritious, eatable seeds that can be prepared for consumption in a variety of ways. Chia seeds were an important cultural and dietary element of life, harvested and consumed by the indigenous populations of Central Mexico and beyond. After the European colonization and the transformation of the American landscape by the European powers, the production of chia and other ancestral grains was forced to compete with newly introduced species whose production eventually replaced them. Recent interest in Pre-Colombian diets as a way to finding healthier food sources has led to a growing commercial interest in chia seeds, with major producers of chia emerging in both the United States and Australia. Just as the banana was once considered an exotic food until its mass production in the early 1900s, chia seeds have gone from a locally grown commodity to a global export in the last thirty years. However, little research has gone into detailing the history of this interesting crop and the impact its rediscovery by Western markets has had not only in the rural communities where it is grown, but in the countries where it is now consumed.

Phylogenetic Investigation of Diversity in the Tropical Clade of Orobanchaceae

Presenter: Skylar Shrum*

While most of the species diversity in the parasitic plant family Orobanchaceae occurs in temperate regions, diversity in the well-supported clade of tropical Orobanchaceae remains largely unexplored. With the exception of Buchnera (with 100 species), most genera of the tropical clade consist of few poorly characterized and rarely collected species. In this study, we greatly expand phylogenetic sampling of species and genera in the tropical clade over previous studies, through field collection of species from the paleo- and neotropics. For the first time, material from the genera Buttonia, Cycniopis, Gerardiina, Ghikea, Micrargeriella and Pseudosopubia are included in systematic analysis of the tropical clade. Further, species sampling of important genera Buchnera, Cycnium, Melasma, Sopubia, and Striga, has been greatly expanded. DNA sequences of the following loci were obtained from circa 150 ingroup and outgroup species: the nuclear Internal Transcribed Spacer (ITS), and chloroplast loci matk, rbcL, rpl16, and rps2. Phylogenetic analysis was used to explore 1) monophyly and relationships among major genera, 2) proposed tribal level taxonomies, and 3) evolution of holo- and hemiparasitism in this clade.

Characterization of Antimicrobial Resistance Genes in Salmonella enterica serovar Typhimurium Human Isolates

Presenter: Lauren Smith*

Salmonella enterica is a significant cause of food-borne disease with an estimated 1.2 million cases in the U.S. annually. Of these estimated cases, only about 3.5% are confirmed in a diagnostic laboratory and reported to the U.S. Center for Disease Control. Of those reported cases, *S. enterica serovars Typhimurium*, Enteritidis, and Newport are responsible for nearly half of the infections. In this study, ninety human clinical isolates of *S. enterica serovar Typhimurium* obtained from the Texas Department of Health were analyzed by PCR for the presence of nineteen antibiotic resistance genes. Over 10% of the isolates were found to have more than 26.3% of the resistance genes present. 87.8% of the isolates tested were found to have at least one antibiotic resistance gene and 33.3% were found to contain two or more genes for resistance. Of the ninety isolates tested for resistance genes, 15.6% had four or more genes for resistance, but no individual isolate contained more than 31.6% of the resistance genes. To determine if genetic antibiotic resistance is on the rise, further studies will be needed to track trends in human clinical infections of S. enterica.

Use of Radiography to Determine the Surface Area of Frontal Sinuses in Human Populations Leading to Possible Gender Identification

Presenter: Kaeleigh Stengle*

The unique development of the frontal sinus in the frontal bone of the skull within human populations has allowed for law enforcement to make positive identification of individuals based on comparisons of antemortem and postmortem X-Rays of the individual's frontal sinuses. However, since antemortem X-Rays are not always available, this research aims to determine whether or not the surface area of X-Rayed frontal sinus can help to positively identify the gender of an unknown individual. In cases in which only partially skeletonized remains are discovered, lacking the presence of long bones, pelvis, or a complete skull, using the frontal sinus to determine gender could greatly aid in identifying the unknown individual.

Curation of a Small Animal Assemblage from Botswana

Presenter: Babbie Suarez*

My project focuses on the curation of a large collection of small animal bones and fossils from the Ngamiland Province, Botswana. The material was collected from the Koanaka Hills cave locality in 2008 and 2009, from both fossil deposits and modern barn owl accumulations from multiple caves. The assemblage consists largely of cranial bones, jaws, isolated teeth and postcranial bones of rodents, shrews, bats, amphibians and reptiles. There are thousands of specimens in the collection which presents a challenge in finding the best way to curate the material so that current and future researchers can most easily access the material and its associated information, such as element, taxon, and provenience. The material will be identified by taxon and elements before being placed in storage vials. Once the collection is completely organized it will be moved to the Sam Houston State University Natural History Collection for permanent storage.

What Three Million People?

Presenter: Sydney Tetens

The United States of America is within a progressive age of racial equality and the advancement of citizen's rights. For Latin American immigrants arriving, this land provides greater opportunities for any who put forth the effort. However within the contemporary histories of the United States, citizens' reactions and experiences of their immigration are often divided. The purpose of this poster is to illustrate and discuss Americans' image of more than three million Latin American immigrants who have arrived to procure greater living opportunities in the United States. This image is often diverse in intentions and perspectives, thus the poster will contain caricatures, political cartoons, and other depictions to allegorize the impression of the image of Latin American immigrants. It will also contain titles to laws and regulations the American government has built in response to the public's reaction to the influx of immigrants. Observers will enjoy the opportunity to delve into a discussion of a historic and present-day topic that has and will influence the future of the United States of America.

An Assessment of Effective Classroom Presentation Methods

Presenter: Darion Walton

This research looks at the work of Robert Pike, a contributor to The ASTD [*American Society for Training and Development*] Handbook for Workplace Learning Professionals. One of the main purposes of any training program is for participants to leave feeling better about themselves, impressed with what they now know that they didn't know before, and what they now can do that they couldn't do before.

Transfer of Training: The Effects of Training in the Workplace

Presenter: Varion Walton

Proper training is one of the largest concerns for businesses. In essence, transfer of training in the workplace is affected by several variables, such as the content and design of the training program, the characteristics of the trainee, and the social system, environment and transfer climate variables. Just as there are variables that negatively affect the transfer of training, there are several variables that play a positive role in the transfer process. Two variables that we are encouraged to do include providing a supportive transfer climate and including participants in the planning process. Even though there are many more types, this presentation will discuss eight different types of transfer: positive, negative, near, far, forward-reaching, backward-reaching, high-road, and low- road. As trainers, we must recognize the variables that have a negative effect on training and improve upon them early in the training process in order to prevent problems further down the line. When we resolve the negative issues, only then will the transfer of training properly occur.

Presentation Co-Author Acknowledgments

Phoradendron leucarpum: Development of Microsatellite Markers for Assessment of Population Genetic Structure

Co-Authored by: Chris Cadena

Influence of Ambient Temperature on Exercise Performance in Young Horses

Co-Authored by: M. J. Anderson, K. W. Walter, and Dr. J. L. Lucia

Antibiotic Exposure Strongly Changes the Normal Microbiota of an Animal

Co-Authored by: Annie B Leonard, Embriette Hyde, Joseph Petrosino, & Dr. Todd P. Primm

Intrageneric Variation of the Inner Ear of Zygaspis (Squamata: Amphisbaenidae) based on High-Resolution X-ray Computed Tomography

Co-Authored by: Justen Adams & Dr. Patrick Lewis

That One Night in Time

Co-Authored by: Patrick A. Evans, Allen Hughes, Anthony Ward, Monty Sloan, Michael Mora, and Michael Stewart

Modern Day Slavery

Co-Authored by: Dr. Maria Botero Jamarillo

B56Î± and B56Î² Function and Specificity

Co-Authored by: Stacey Batres

Developing a Novel Method for Identifying 2-aminothiazoline-4-carboxylic Acid Using Surface Enhanced Raman Spectroscopy

Co-Authored by: Emily Miller, Deepthika De Silva, & Dr. David Thompson

In vivo Construction of recA Mutant in Rhodobacter sphaeroides 2.4.1

Co-Authored by: Michelle Harrel, Raeanna Thompson, and Daniela Ortiz

Expression of B56 in the embryonic gut of Xenopus Laevis

Co-Authored by: *Dr.* Joni Seeling

The Incremental Validity of Neuropsychological Testing for Foster Children

Co-Authored by: Dr. Adam Schmidt

Poster Presentations

PPE Gene Family Members in Non-Mycobacterial Species

Co-Authored by: Dr. Todd P. Primm

Description of the Cranial Anatomy of Gehyra mutilata Using High Resolution Micro-CT

Co-Authored by: Dr. Monte Theiss and Juan Daza

Sequence Comparisons of Aurora Kinase Homologs in Rhodobacter sphaeroides

Co-Authored by: Damilola Omotajo, Hyuk Cho, and Dr. Madhusudan Choudhary

Antibiotics as Both Beneficial and Disruptive

Co-Authored by: Dr. Primm and Jeanette Carlson

Characterizations of Antimicrobial Resistance Phenotypes in Salmonella enterica Human Isolates

Co-Authored by: Lauren R. Smith, Daniel P. Haarman, and Dr. Aaron M. Lynne

Social Physique Anxiety: Does Personality Play a Bigger Role Than We Think?

Co-Authored by: Stephanie Spies-Upton, Craig Henderson, Jessica D. Graham, and Scholar Colbourn

In-vivo Construction of recA Mutant in Rhodobacter sphaeroides

Co-Authored by: Travis Tate, Raeanna Thompson, Daniela Ortiz, and Dr. Madhusudan Choudhary

A Description of the Cranial Anatomy of Kuroiwa's Ground Gecko, Goniurosaurus kuroiwae (Eublepharidae: Gekkota), Using High Resolution Micro-CT

Co-Authored by: Dr. Monte Thies and Juan Daza

Use of Synthetic and Garlic Sulfur Donors to Treat Cyanide Intoxication

Co-Authored by: Dawn Fisher and Stephen Lee

Does Urbanization Explain Preferential Use of Alarm Calls by Carolina Wrens, Thryothorus ludovicianus?

Co-Authored by: Dr. Diane L.H. Neudorf

Identification of a P53-like Protein in Chlamydomonas reinhardtii

Co-Authored by: Terah Hardcastle, Sarah Moseley, and Dr. Anne R.Gaillard

Molecular Community Analysis of the Microbiome

Co-Authored by: Skylar Shrum, Lee Tracy, and Zak Carroll

Variation in the Mandible of Zygapsis (Squamata: Amphisbanidae)

Co-Authored by: Dr. Patrick Lewis

Ecomorphology in the Spaerodactyl Geckos

Co-Authored by: Dr. Patrick Lewis and Juan D. Daza

Phylogenetic Investigation of Diversity in the Tropical Clade of Orobanchaceae

Co-Authored by: David Hammack

Characterization of Antimicrobial Resistance Genes in Salmonella enterica serovar Typhimurium Human Isolates

Co-Authored by: Dawn M. Fisher, Daniel P. Haarmann, and Dr. Aaron M. Lynne

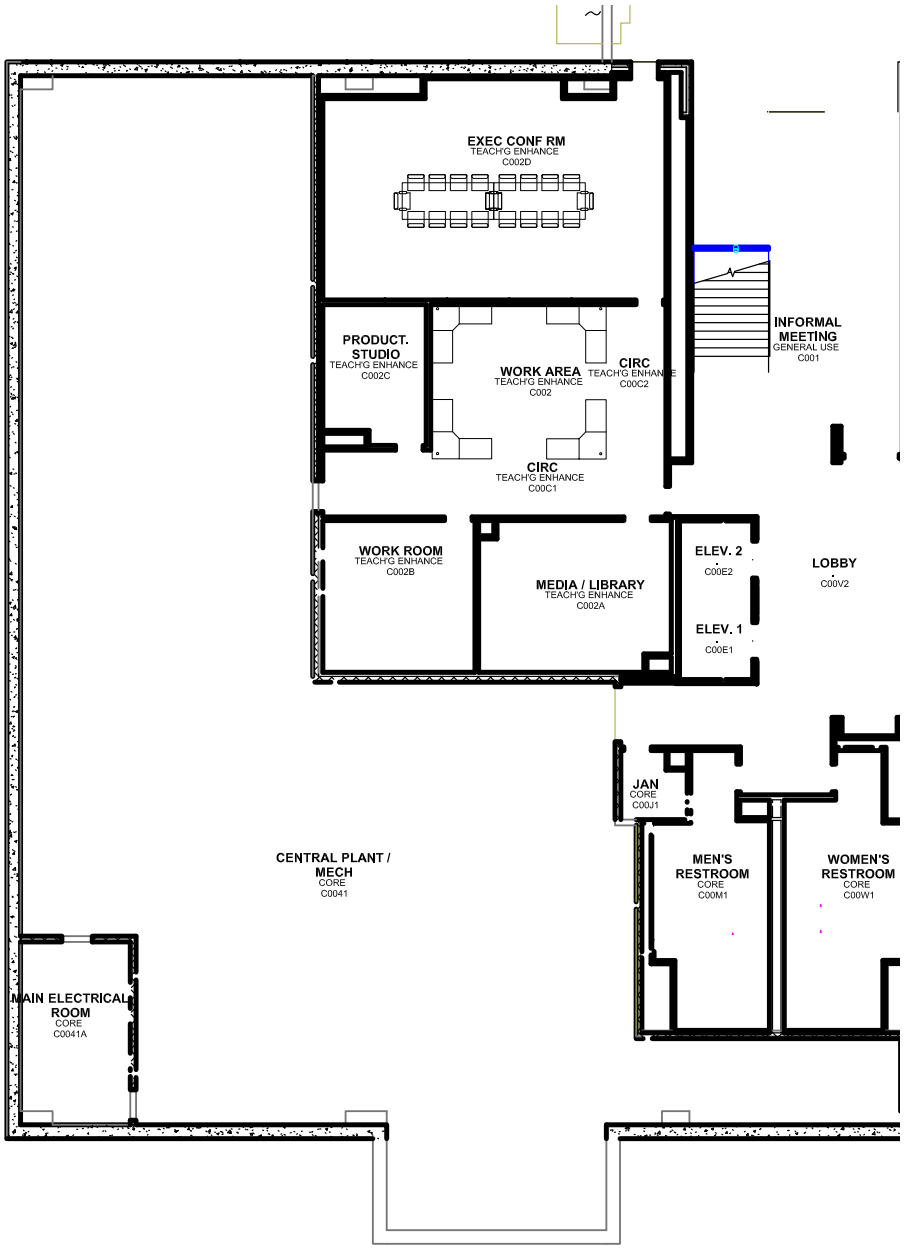
Use of Radiography to Determine the Surface Area of Frontal Sinuses in Human Populations Leading to Possible Gender Identification.

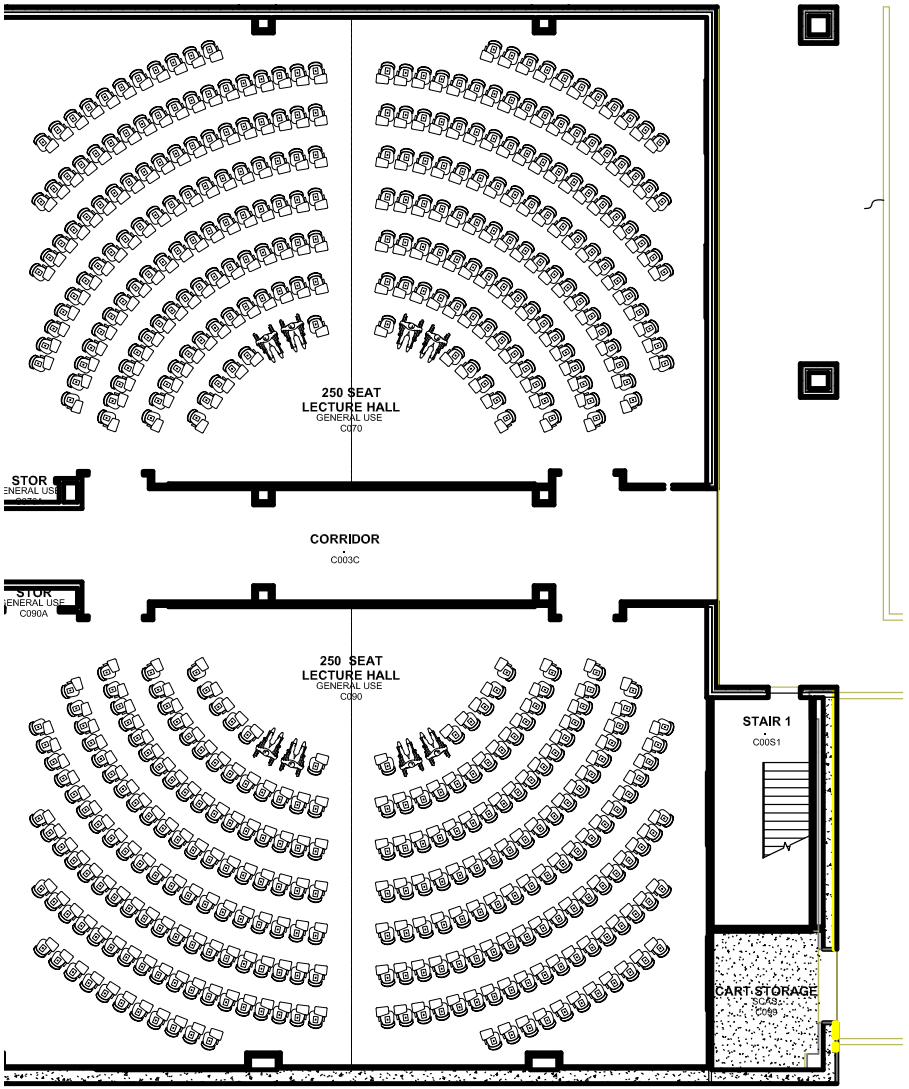
Co-Authored by: Jim Bagwell

Curation of a small animal assemblage from Botswana

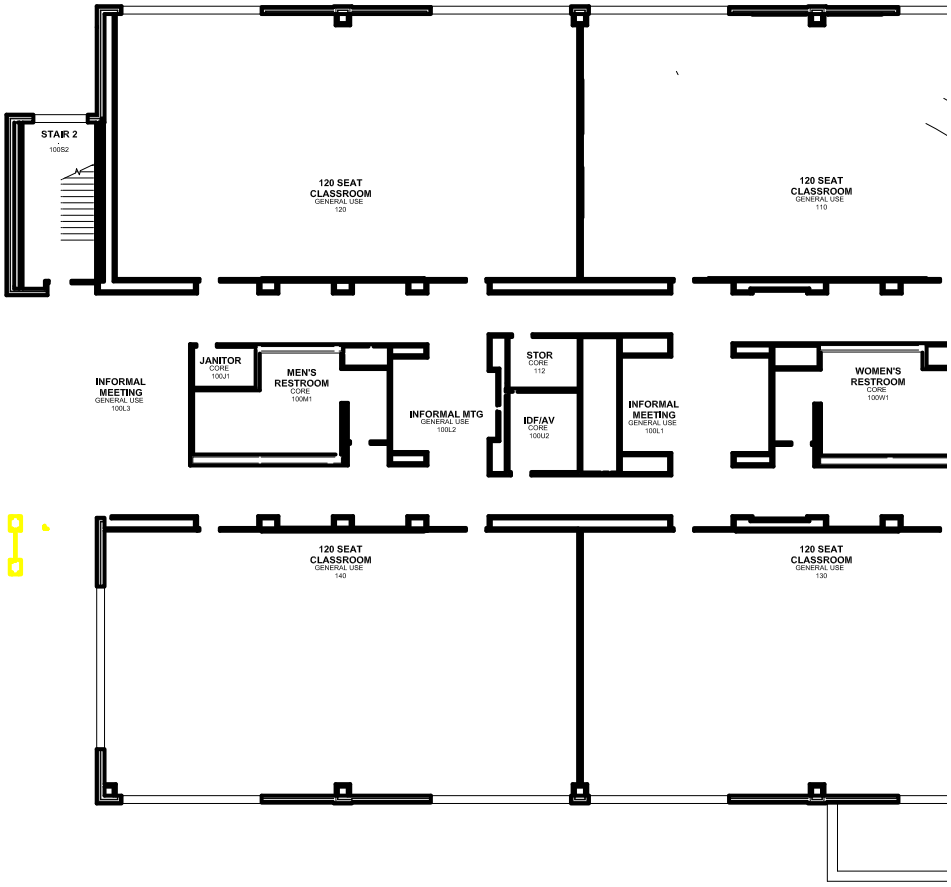
Co-Authored by: Michelle Labbe, Dr. Monte L. Thies, and Dr. Patrick J. Lewis

CHSS Concourse Floor





CHSS First Floor



CHSS Second Floor

Campus Map


SAM HOUSTON
MEMORIAL MUSEUM
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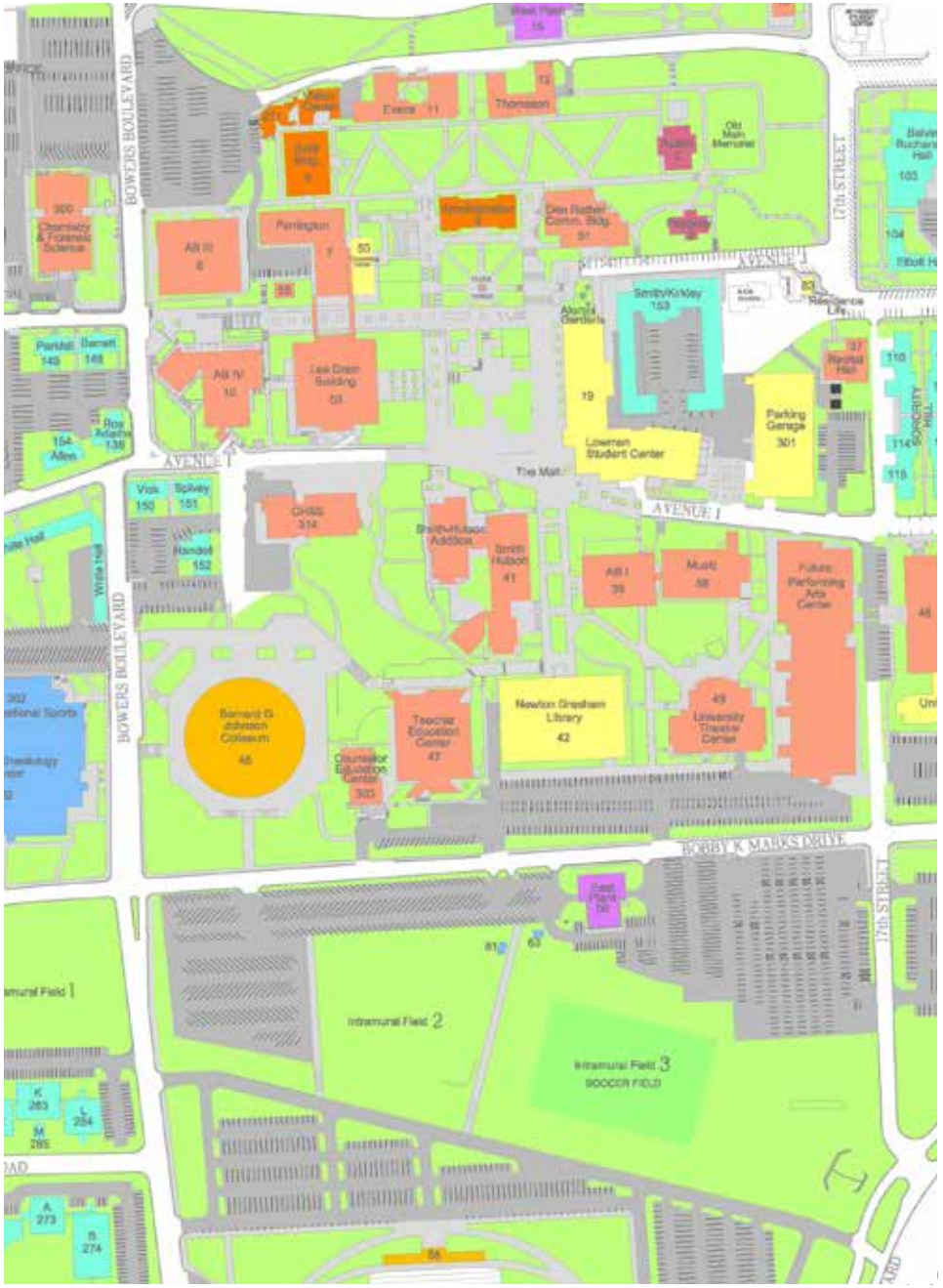
BOWERS BOULEVARD
13th STREET
17th STREET
AVENUE I
Lowman Student Center
Newton Gresham Library
Bernard G. Johnson Coliseum
Intramural Field 2
Intramural Field 3
SOCCER FIELD

URS History and Mission Statement

In 2008, the Honors Student Ambassadors began the Undergraduate Research Symposium (URS). The goal was two-fold: to share research with fellow students and to gain experience in preparation for future conferences. Today, the URS continues to provide a forum where all SHSU undergraduate students can present their research to others in a professional environment, while giving students the opportunity to gain expertise in their field and receiving feedback from other scholars and members of the academic community. The URS offers three $500 awards: The Assam Scholarship for Honors Research Award, The Honors College Award for Best Overall Oral-Media Presentation, and the Honors College Award for Best Overall Poster. The URS is supported by the faculty and staff of the Elliott T. Bowers Honors College.

About the Honors College

The Honors College at Sam Houston State University is for highly motivated and academically talented students. Within the Honors College, the university's best students are provided special course offerings, leading to an unusually broad educational experience; they are offered limited enrollment classes, closer contact with outstanding faculty, and expanded campus privileges, including advanced registration, residence halls with quiet hours, and the Honors Computer Lab and Study Lounge.

A unique learning community administered by nurturing faculty and staff, the Honors College provides guidance and support for serious students as they become well-rounded and truly educated individuals. As graduates with "High Honors," our students leave the university with impressive academic accomplishments and the preparation needed to enter graduate or professional schools as well as the workforce.
The Honors Ambassadors is an elite group of enthusiastic and involved Honors students who represent the highest ideals of the university. Through leadership and service, the Ambassadors sponsor special events, such as the Undergraduate Research Symposium, that support and enhance the Honors community at SHSU.

Honors Council

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Frank Fair	Philosophy
William Hyman	Health & Kinesiology
Patrick Lewis	Biological Sciences
Brian Loft	Mathematics
Holly Miller	Criminal Justice
Valerie Muehsam	Business
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Stacy Ulbig	Political Science
Pamela Zelbst	Management

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Shealynn Vogan	Undergraduate Student Assistant

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Trey Cawley	Samantha McKinley	Lea Sonby
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Katherine Hernandez	Sebastiaan Roling	

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The Honors Ambassadors thank you for coming and look forward to seeing you next year!

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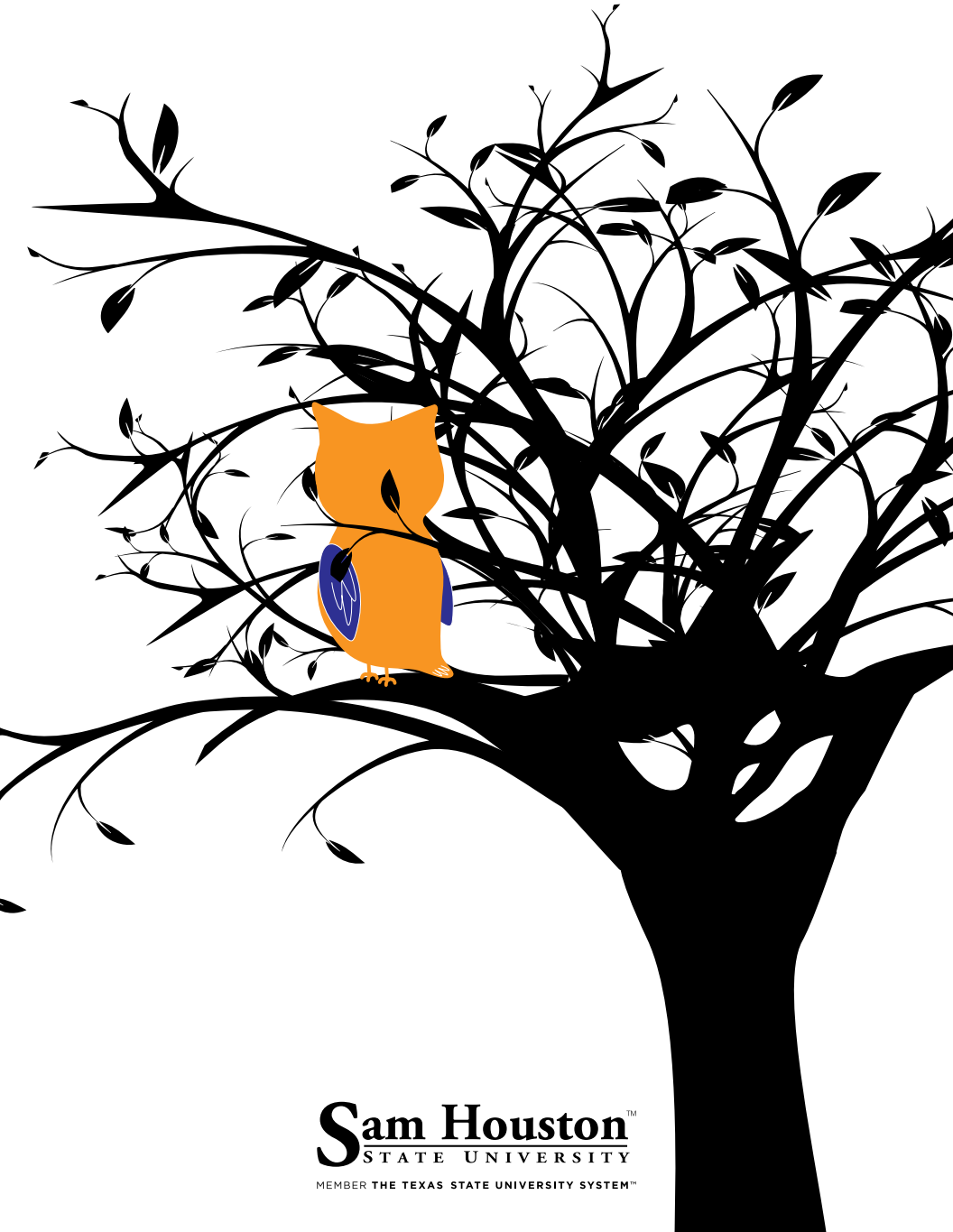

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