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**FINE ARTS ORAL SESSIONS**

**Film Images**

**417 Clough, 11:00-11:40am**

**Session Chair: Bailey Romano**

**11:00**

**Inspiring Creativity through Community Outreach: Photography Club at The Neighborhood School**

Allison Dove, Shardé Chapman

Faculty Sponsor: Liz Daggett, Department of Art

The Neighborhood School is an elementary through middle school that serves students that are determined to be "the most likely to drop out of high school" in the Memphis area. It is located in the very impoverished Binghampton neighborhood. In order to bring a creative outlet to the underserved and at-risk students of TNS, CODA provided funding for an afterschool photography club where a group of students learned about photography, took photos on their own, and ultimately had an art show where they could invite family and friends to view the students' artwork. The idea for the program was to provide an opportunity for students to begin thinking creatively in general and also allow them to see that they can find creativity at home as they take photos in their homes and around their neighborhood. Otherwise for these students, this opportunity would not otherwise exist.

**11:20**

**The Ugly One**

Pieter Smith

**1:20**

**2:20**





aims to demonstrate that the relationship between humans and animals is not as limited as society traditionally defines it. Designing costumes to blur the supposedly problematic notion of love between humans and creatures in the play as well as creating an environmentally conscious set would successfully complicate the boundaries society so often creates. Ultimately falling short of an endorsement of bestiality, the play offers a green reinterpretation of human interaction with nature.

**3:20**

**Whitney Ranson: Artist Lecture**

Whitney Ranson

Faculty Sponsor: Erin Harmon, Department of Art

Growing up in a rural setting I learned early in life to appreciate nature and hold myself responsible for my personal impact on our planet. My current work reflects the respect for the world and its ecosystems that was instilled in me



**Philosophy**

**205 Kennedy, 11:00am-noon**

**Session Chair: Austin Freeman**

**11:00**

**Providing Justice and Peace: The International Criminal Tribunal for the Former Yugoslavia**

Jane Barrilleaux

Faculty Sponsor: Leigh Johnson, Department of Philosophy

Providing Justice and Peace: The International Criminal Tribunal for the Former Yugoslavia uses political philosophy to analyze the establishment of an international war crime tribunal after the Yugoslav War in 1991. The

**11:45**

**Little Freedoms**

Manali Kulkarni, Courtney Martin

Faculty Sponsor: Leigh Johnson, Department of Philosophy

For our existentialism class, we were given the option to create short videos that represented the ideas of existential philosophers we had studied. Courtney Martin and I took Merleau-Ponty's basic philosophy a



**Religious Studies and Philosophy**

**205 Kennedy, 1:00-2:00pm**

**Session Chair: Austin Freeman**

**1:00**

**Applying John Calvin**

Stephanie Gregory

**1:45**

**The Veil**

Walter Clapp





**Interdisciplinary Humanities: The Search for Individual Meaning**

**Frazier-Jelke C, 2:00-3:00pm**

**Session Chair: Elizabeth Tomlinson**

**2:00**

personal identity and shifting the focus to the gods as they begged for their help. Beggars are people that beg out of subsistence from humans. Suppliants beg more out of prayer to the gods. They do not beg humans.

**2:30**

**Judging Fiction as History: The Merits of Latin American Novelists' Depiction of Historical Events**

John Pevy

Faculty Sponsor: Willie Hiatt, Department of History

My research this semester examines Latin American fictional texts as historical documents. I argue that novels and short stories are important archival sources because they provide authors the freedom to explore important social, political, and cultural currents beyond historical context. These works help us understand the social classes of the authors, and their relationship to the topics they wrote about provides insightful commentary on how separate socioeconomic classes in Latin America view one another and interact across cultural boundaries. By examining works from the indiginismo period, a period of Latin American literature focusing on the plight of indigenous populations, the boom period, and those works dealing with political violence I have uncovered many nuanced ways to interpret historical content

**English & Gender and Sexuality Studies**

**208 Kennedy, 2:15-3:30pm**

**Session Chair: Anne Wilson**

**2:15**

**"An affair of sense": Godwin's Caleb Williams and the Burkean Sublime**

Andrew Miller

Faculty Sponsor: Michael Leslie, Department of English

The English political philosopher and novelist William Godwin's *Things as They Are; or, The Adventures of Caleb Williams* (1794) stands in a vexed relationship with the thought of statesman Edmund Burke both political (*Reflections on the Revolution in France* [1790]) and aesthetic (*A Philosophical Enquiry into the Origin of Our Ideas of the Sublime and Beautiful* [1757]). My interest is in how Godwin's novel holds and critiques the two as inextricable, thereby bringing to light the moral and political implications of Burke's theory of sublimity.

**2:30**

**History, Paratext, and Myth**

John Yackulics

Faculty Sponsor: Michael Leslie, Department of English

The importance of history to myth, and myth to history, is evident most particularly in Sir Walter Scott's novel *The Bride of Lammermoor* in the way that the different paratexts, or texts within the text of the novel, such as Scott's footnotes and the novel's prologue, flesh out a historical mythology of two families, in particular Lucy Ashton and Edgar Ravenswood. These paratexts, give history a new meaning within the novel. History in *The Bride of Lammermoor* is something that fetters the two main characters to a dismal and tragic fate, and the paratexts that operate within that novel flesh out that history by giving a historical air of authenticity to the novel itself. This presentation would focus on the creation of a Romantic historiography that Scott sets up within the novel, and what

**3:00**

**Cultural Imperialism in Peter Carey's "War Crimes"**

Noah Black

Faculty Sponsor: Jason Richards, Department of English

In the A



## **NATURAL SCIENCES ORAL SESSIONS**

### **St. Jude Summer Plus Program**

**Frazier-Jelke A, 1:00-2:00pm**

**Session Chair: Stephanie Milazzo**

**1:00**

### **Protein Phosphatase 2C $\beta$ 1 Regulates Human Pregnane X Receptor-Mediated CYP3A4 Gene Expression in HepG2 Liver Carcinoma Cells**

Alexander Tong; Satyanarayana Pondugula, Taosheng Chen, St. Jude Children's Research Hospital

Faculty Sponsor: Darlene Loprete, Department of Chemistry

The human pregnane X receptor (hPXR) regulates the expression of cytochrome P450 3A4 (CYP3A4), which plays vital roles in hepatic drug metabolism and is known to have considerably reduced expression levels in proliferating hepatocytes. Signaling molecules such as kinases and phosphatases contribute to the regulation of hPXR. We have recently shown that cyclin-dependent kinase 2 (Cdk2) negatively regulates hPXR-mediated CYP3A4 gene expression. Cdk2 can be dephosphorylated and inactivated by protein phosphatase type 2C beta isoform long (PP2C $\beta$ 1), a unique phosphatase that was originally cloned from human liver. In this study, we sought to determine whether PP2C $\beta$ 1 is involved in regulating the activity of hPXR, and whether PP2C $\beta$ 1 affects Cdk2 regulation of the hPXR activity in HepG2 liver carcinoma cells. In transactivation assays, transiently coexpressed PP2C $\beta$ 1 significantly enhanced the hPXR-mediated CYP3A4 promoter activity. In addition, PP2C $\beta$ 1 notably relieved the inhibitory effect of Cdk2 on hPXR transactivation activity. Furthermore, shRNA-mediated downregulation of endogenous PP2C $\beta$ 1 remarkably attenuated the hPXR transcriptional activity. Neither overexpression nor downregulation of PP2C $\beta$ 1 affected the expression levels of hPXR. Our results show for the first time that PP2C $\beta$ 1 is essential for the activity of hPXR, and can positively regulate the activity of hPXR by counteracting the inhibitory effect of Cdk2.



access, navigation, and display of the spatially organized data. Using Google Earth in the project gives greater control to the user accessing the data, allowing him or her to choose which extent to view and which data to display. The final product displays data in an economical and more diverse way than what is possible with a series of individual maps.

**1:30**

**A Novel, NIRS Based Approach to Chytrid (*Batrachochytrium dendrobatidis*) Detection in the Toad *Anaxyrus fowleri***

Daniel Eastlack, Andy Kouba, Memphis Zoo; Carrie Vance, Mississippi State University

Faculty Sponsor: Jon Davis, Department of Biology

Amphibian populations are declining globally due to, in part, the rapid spread of the pathogenic chytrid fungus, *Batrachochytrium dendrobatidis* (Bd). The goals of our study were to determine if Bd is present in Fowler's toad (*Anaxyrus fowleri*) populations around Memphis, TN and to use the toads as a model species to develop a novel, and rapid method of Bd screening based on Near Infrared Reflectance Spectroscopy (NIRS) both in-situ and ex-situ. We used Taqman quantitative PCR to confirm Bd infection at 7 of 11 study locations in 11 of 159 sampled individuals; however, populations are thriving at these sites without evidence of widespread mortality, perhaps indicating Bd resistance in *A. fowleri*. Our library size of *A. fowleri* Bd-positive NIRS spectra is very small (n=2), yet these spectra are visibly discernable from Bd-negative spectra and may provide an NIRS-based diagnostic method for determination of Bd-status in *A. fowleri*.

**1:45**

**Behavioral Modifications Following Tail Loss in Lizards**

Julia Goss

Faculty Sponsor: Jon Davis, Department of Biology

Tail autonomy is an effective predator avoidance strategy used by lizards; however, it results in subsequent costs including loss of energy reserves, reduced locomotor ability, and altered behaviors and social status. Notably, tail loss can negatively affect lizards' foraging behavior and reproductive success. We conducted prey detection trials to test the hypothesis that increased prey detection behavior is a mechanism by which lizards replace energy stores lost due to tail autonomy. We scored the intensity of prey detection behavior of 10 lizards towards three stimuli: (1) control = deionized water, (2) nonsense control = 1:500 dilution of hand soap, and (3) prey = cricket scent before tail loss and at 50% and 95% regrowth. In addition, we also tested the hypothesis that social status of males decreases following tail autonomy. We randomly paired 1 female with 1 male, videorecorded each 20 minute behavioral trial, and later analyzed the video to score the females' spatial proximity and social behaviors towards each male. Results of this study will help clarify the trade-offs between tail autonomy and subsequent predatory and social behaviors in lizards.

**2:00**

**Stop and Smell the Roses: How Olfactory Enrichment Affects the Behavior of Captive Jaguars (*Panthera onca*) at the Memphis Zoo**

Stephanie N. Cassel, Allison Graham; Andy Kouba, Morgan Powers, Memphis Zoo

Faculty Sponsor: Sarah Boyle, Department of Biology

Jaguars (*Panthera onca*) require enrichment to promote active behavior in order to maintain fitness while in captivity. The purpose of our study was to evaluate changes in behavioral and spatial activity with the introduction of novel scents for two captive female jaguars displayed at the Memphis Zoo in the fall of 2009, as well as to evaluate the effect of enrichment upon a single female jaguar in the spring of 2010. During 60-minute control and enrichment periods, jaguars were monitored through 5-minute interval group scans, recording behavior and location for 8 weeks. Following exposure to olfactory enrichment, a continuous behavior scan was also conducted on behaviors associated with enrichment (sniffing, rubbing, licking and scratching). The jaguars spent more time



**2:15**

**Development of Non-Invasive Reproductive Monitoring Techniques for Endangered Amur Leopards**

Allison Graham; Michael Drake, Andy Kouba, Erin Willis, Memphis Zoo

Faculty Sponsor: Jon Davis, Department of Biology

An understanding of the reproductive biology of critically endangered snow and Amur leopards can aid in conservation efforts. The first objective of this study was to optimize fecal steroid hormone extraction procedures using snow leopards as a model. We compared combinations of different fecal steroid hormone extraction procedures to determine which method extracted the greatest amount of steroids. For fecal androgens, a 6.8-fold increase in concentration was found when samples were extracted with methanol and vortexed for 20 minutes compared to other extraction methods. This method also yielded a greater amount of estrogens. Our next objective was then to determine appropriate antibodies for enzyme immunoassays, as well as reproductive seasonality in the closely related Amur leopard. Results indicated broad scale testosterone and progestin antibodies and an estrogen metabolite (estrone glucuronide) antibody could be used to measure fecal steroid hormones in Amur leopards. In male Amur leopards, preliminary results indicate that the average level of testosterone for the transitional month of September was lower than the average level for fall months. For females, differences in estrogens indicate that summer is suppressing ovarian function. Results from these studies will characterize the seasonal reproductive profiles and assist with the conservation of these leopards.

**Quantitative and Computational Science**

**Frazier-Jelke A, 2:15-3:45pm**

**Session Chair: Stephanie Milazzo**

**2:15**

**Radiation Safety in Medicine**

Chase Sliger; Bill Maguire, Methodist University Hospital

Faculty Sponsor: Ann Viano, Department of Physics

Health physics is an important part of ensuring patient and employee safety during medical procedures involving radiation. Two important areas are in the design of shielding for PET/CT scan rooms and determining the amount of radiation patients receive as part of therapy. Calculations were performed to determine the required thickness of lead needed to properly shield hospital staff and patients and family in the surrounding area for the installation of new equipment at Methodist University Hospital. A second project computed the dosage of I-131 patients received for either hyperthyroidism or thyroid cancer and a determination as to whether or not release from the hospital was safe. Both projects illustrate the use of physics for medical safety in routine hospital procedures.

**2:30**

**Gamma-Euler-Satake Characteristics on Orbifolds**

Ryan Carroll

Faculty Sponsor: Christopher Seaton, Department of Mathematics and Computer Science

The Euler characteristic of a geometric object such as a sphere or torus (doughnut) is a number calculated via a concept known as triangulation and is associated to that specific space. For example, the Euler characteristic of a

**2:45**

**Studying the Effectiveness of Various Input Methods when Interacting with a Large-Screened Computer from a Distance.**





Undergraduate Research and Creative Activity Symposium

activity of oxytocin and vasopressin influence areas of the brain associated with the dopamine reward pathway, making social behavior and affiliation with one's partner rewarding. Additionally, these hormones, especially oxytocin, help solidify social memories of one's partner. The combined effect of oxytocin and vasopressin facilitate the formation of strong social attachment between two individuals and often leads to, if not sexual monogamy, then at least monogamous social affiliation.

**Anthropology & Sociology Research I**

**212 Buckman, 11:00am-12:15pm**

**Session Chair: Elizabeth Hook**

**11:00**

**If it Flies it Dies: An Ethnography of Ducks Unlimited**

Andrew Hammond

Faculty Sponsor: Thomas McGowan, Department of Anthropology & Sociology

The purpose of this project is to help explain how a successful environmental conservation organization can thrive despite the fact that most of its members hunt the very animals they pledge to protect. I have conducted an

conducted with 16 college-aged American females who participate in America's Japanese subculture. Half of these women have been to Japan, half have not. The interviews show the complexity of culture and the need to go beyond traditional Marxist theory to study cross cultural, capitalist consumption.

**11:45**

**Mapping the Beat: Gender and Race in the Memphis Police Department**

Armanda Venezia

Faculty Sponsor: Thomas McGowan, Department of Anthropology & Sociology

This research focuses on the impact of race and gender on policing style and views of authority in the Memphis Police Department. The research consists of an ethnographic study of the daily activities of MPD patrol officers. The ethnography involved ride-alongs with officers on duty, which provided an environment for participant-observation and a chance to become fully engaged in the field. Through a review of relevant literature, the theoretical framework of constructionism emerged as the most fitting conceptualization for this study. Additional areas of inquiry include racial profiling, police brutality, the negative reputation of police, and the presence of corrupt cops in the media. This study shows that most officers view both crime and policing style as complex constructs influenced by a variety of social-structural, institutional and environmental factors.

**12:00**

**A Depilation Nation: The Politics of Body Hair**

Molly Bombardi-Mount

Faculty Sponsor: Thomas McGowan, Department of Anthropology & Sociology

The general purpose of this research is to study the way individual behavior can empower the self and simultaneously undermine or destabilize oppressive social norms. Specifically, this study explores the narratives of females who have disavowed the feminine identity-marker of hairlessness and how their actions are experienced as a form of embodied empowerment that challenges the feminine beauty ideal fixed by the dominant discourse. Personal stories gathered through dialogic interviews show how females, oppressed by a domineering system that expresses disgust for female body hair, have redefined feminine beauty and are destabilizing the current concept of the feminine mystique. My interpretive analysis of the narratives explores how these females have come to perceive the limitations, exclusions and anxieties engendered by the feminine beautification system in America. My research illuminates certain patterns of the socialization of females that are generated by specific social, political, and

theoretical alternative to Gan's economically restricted view of Pentecostalism. Following Durkheim, Pentecostalism is viewed as a positively functional social institution that provides order and meaning to its members.

**1:15**

**An Exploration of the Memphis Holistic Health Community: Holistic Health Inspiring Holistic Lifestyles**

Kimberly Brodziak

Faculty Sponsor: Thomas McGowan, Department of Anthropology & Sociology

The purpose of this research is to understand the phenomenological meaning of holistic health among holistic health practitioners in Memphis. In-depth interviews were conducted with ten holistic health practitioners to gather first-person narrative descriptions of their experiences with holistic health. Interview subjects were selected using a snowball sampling method. An inductive, qualitative interpretive approach was used to identify how the meaning of health is represented in the personal and professional experiences, and lifestyles, of the interview subjects. A phenomenological theoretical framework is used to frame the interpretation of narratives and identify common themes across the subjects' descriptions of embodied experiences that disclose the meaning of holistic health. This includes narrative descriptions of embodied experiences leading to the decision to study holistic health, become a professional holistic healer, and choose a holistic lifestyle. This research shows how individual experiences can inform the emergence of a holistic self and professional identity that deviates from several dominant cultural assumptions.

**1:30**

**An Ethnographic Study of Nurse-Patient Relations in a Clinical Setting**

Kathryn Sella

Faculty Sponsor: Thomas McGowan, Department of Anthropology & Sociology

This ethnographic study explores the clinical setting and provider-patient interaction at Methodist University Hospital's Outpatient Cardiovascular Center. Ethnographic description of the clinical setting and participant-observation are used to study the clinic's culture and the types of interaction engaged in between staff and patients. Special attention is placed on the interaction between nurses and patients and the importance of cross-cultural understanding and its role in structuring nurse-patient relationships. The concept of cultural competence is used to frame interpretations of field observations regarding nurse-patient interaction. A key finding of this study is the way language and concrete examples are used by staff to communicate important information regarding self-care to





**Research in Economics**

**110 Buckman, 1:00-2:45pm**

**Session Chair: Meredith Hicks**

**1:00**

**The Effectiveness of the Ballot Box**

Allyson Pellissier

Faculty Sponsor: Teresa Gramm, Department of Economics & Business

The main purpose of this investigation lies in examining the creation and sustenance of these legal parameters through congressional voting behavior. In political science, there exist two roles that legislators fulfill: trustee and representative. In the first role, the jurisdiction entrusts its legislators with using their expertise to determine the best policy. In the second, it expects its legislators to represent accurately its expressed policy preferences (as revealed through elections and polls). In economics, this distinction exists but takes on a different mold. The literature in economics uses market terminology, with political candidates being the demanders of votes and constituents being the suppliers; on the other hand, when considering policy, legislators are the suppliers and constituents are the demanders. This study analyzes the three proposed motivations behind legislative voting: personal ideology, logrolling, and representation of the prevailing jurisdictional ideology. The existing literature reaches disparate conclusions about which factor serves as the prevailing influence in voting on proposed legislation. In reality, legislators likely draw from all three sources of motivation for different votes. This investigation will test these three prompting influences using data drawn from roll call votes in the past decade. To test these different possible influences, it uses economic regression models, as well as mathematical clustering techniques. This project also analyzes the effectiveness of the political market. That is, it seeks to answer definitively the question of whether the current election system effectively punishes legislators when they shirk. Moreover, it distinguishes between shirking in the form of absenteeism and shirking in the form of voting against jurisdictions' ideologies.

**1:15**

**Public or Private? The Effects of a Private, Public, and Catholic Education on Financial Aid and College Performance**

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nonobese women, obese women may devote more time and effort to labor market activity, increasing their expected wage due to work effort. If we ignore marriage transitions in estimating an obesity wage gap, our results may actually understate the true obesity wage gap.

**Ethnography at Home**

**214 Buckman, 1:15-4:00pm**

**Session Chair: Neha Mehta**

**1:15**

**Flexibility and Functionalism: A Westernized Study of the Yogi Lifestyle**

Brittany Gray

Faculty Sponsor: Susan Kus, Department of Anthropology & Sociology

Ethnography is the method of research using participant-observation as a main avenue of studying separate cultures than one's own. The ethnographic method is a two-part approach, the first part utilizes participation within the cultural scene being studied; secondly, observation is used to gain an objective perspective. I have employed the ethnographic method as a foundation for my studies of yoga in order to gain a more in depth knowledge, appreciation, and understanding of the Yogian culture. My studies were conducted at the Midtown Yoga studio, located in Midtown Memphis, Tennessee. Yoga entails many levels of practice, and as a student anthropologist it is vital to not only to study various levels but to focus oneself according to the allotment of time. Throughout the duration of my practices at Midtown Yoga I attended a separate session for each differing day until I settled into a personal rhythm with fellow yogis and the facility itself. This specific focus has allowed more time to observe a set group of yogis, although there were constant variability. I have learned that yoga is more than an hour long



**3:00**

**Between Bites: An Anthropological Look into the Social Community of Dino's Grill**

Daniel Wolfe

Faculty Sponsor: Susan Kus, Department of Anthropology & Sociology

Research is a crucial part in understanding the various educational studies in the world today. Within the field of

**3:45**

**Exotic Aerobics: Stripping Away the Misconceptions**

Brianna Levy

Faculty Sponsor: Susan Kus, Department of Anthropology & Sociology

Among women, there is a culture, only understood by women, that bonds us in unexpected ways. Gender roles peg women as sexual beings, while calling on women to be quiet and shy. It is fair to say that across the world, women of extreme sexual confidence are looked down upon. Eccentric Studios is an aerobics studio that seeks to break women from social constraints and allow them to come into their own. The studio promotes self-confidence, comfort in one's own skin, and personal sexiness. This is done through classes like Strip-to-Fit, Pole Dancing: Levels 1-3, Hot Body Boot Camp, and a few others. This semester, using the ethnographic method of participant observation, which calls for research to be done within the field by learning a culture in order to understand it, I immersed myself in the culture that surrounds Eccentric Studios. While taking classes and interacting with the instructors and patrons of Eccentric Studios, I attempted to gain an understanding of how these women combat the ideas that others may have about them for being a part of such an institution. Beyond that I discovered that it is more than just a facility that provides a fun way to get in shape and gain confidence. It is also a facility that provides a space for women to come together and support each other, building a community with an unexpected—and not necessarily politically correct—common link.

**Buckman Scholars Presentations**

**110 Buckman, 3:00-3:30pm**

**Session Chair: Elizabeth Hook**

**3:00**

**Life Through a Provencal Lens: A Novel Perspective**

Olivia DeLozier

Faculty Sponsor: Steve Ceccoli, Department of International Studies

Studying in Aix-en-Provence while deeply submerged in French culture and language is a dramatically life-changing experience. The experience demonstrated the importance of building relationships and communication

**POSTER SESSION I (poster numbers precede titles)**

**Multisports forum, Bryan Campus Life Center, 11:00am–1:00pm**

**Fine Arts**

**#7 Harp Ensemble Outreach**

Amber Owens, Julz Anderson, Leerin Campbell, Kelly Dodson, Mae Gillespie, Annabelle Young, Ye Zheng

Faculty Sponsor: Gina Neupert, Department of Music

The Harp Ensemble developed an outreach program that has enabled the group to play for various members in the community that would not normally be exposed to harp music. The focus of the harp ensemble was to touch the lives and provide a release from daily stress and worries for patients of St. Jude, nursing home patients, and young students alike. Through this the harp ensemble has encouraged music education in the community as well as fostered a link to Rhodes College. The production of a CD of the harp ensemble allowed for the music to be distributed in the community so that the music could touch the lives of many for a much longer time in the future. The work of the harp ensemble is being continued through all participants on a regular basis as the members strive to help others in the community in all ways as well as encourage students to take an interest in music.

**Social Sciences**

**#8 The Effects of Campus Engagement on Career Attitude**

Dat Nguyen

Faculty Sponsor: Dee Birnbaum, Department of Economics and Business

Many researchers have examined the effects of student engagement (campus engagement) on academic achievement, career development, and job placement upon graduation. Unfortunately, limited research has been done on the relationship between student engagement and attitude toward one's career. The purpose of this paper is to take the literature a step forward by exploring the different measures (cognitive and emotional) of campus engagement and how they are related to student attitude toward his or her internship/externship. The sample consisted of 49 nur.54 T7\*95(9g)-10(n)6rf Many r8(o)-5(r)2(r)-32 Tdo 4odrvh(al))-(n)6(d)-(r)-3nd14(o)6<0048000-3(ad)-4(o)6<0048



**#10 An Examination of Student Satisfaction, Color Blind Racial Attitudes and White Privilege Attitudes: The Impact of Race/Ethnicity**





## **Environmental Science & Geographic Information System (GIS)**

### **#19 Spatial Patterns and Behavioral Activity Budgets of Grey Wolves (*Canis lupus*) at the Memphis Zoo**

Stephanie N. Cassel, Andy Kouba, Memphis Zoo

Faculty Sponsor: Sarah Boyle, Department of Biology

Grey Wolves (*Canis lupus*) are experiencing widespread habitat destruction and have been negatively impacted by human interactions in the wild. Limited research has been done on wolf habitat use in captivity. With the opening of Teton Trek at the Memphis Zoo, four grey wolves were introduced into a new public exhibit. The objectives of this study were to create activity budgets of the four wolves and to analyze the spatial use of the exhibit through Geographic Information Systems (GIS) mapping. Data were collected from October 2009 through February 2010. Using 5-minute interval group sampling, we recorded the behavior and geographic location of each individual in sight. These data were then analyzed to determine overall activity budgets for the wolves, and to identify areas of concentration within the exhibit using GIS. Through geospatial analysis, we concluded that the wolves maximized full use of their enclosure. We also found that the wolves spent the majority of time sleeping, resting, traveling, and interacting with visitors through staring or head movement. We compared these results with previously published literature on wolves in captive environments. Through this study, we hope to promote conservation through a better understanding of captive wolf behavior.

### **#20 I Speak for the Bamboo: An Evaluation of Red Panda (*Ailurus fulgens*) Habitat and Human Impact**

Stephanie N. Cassel, Allison W. Graham

Faculty Sponsor: Sarah Boyle, Department of Biology

Red Pandas (*Ailurus fulgens*) inhabit a small geographic range within parts of Nepal, India, Bhutan, Myanmar and

result of climate change but rather poor planning in water conservation. While Memphis is not in immediate danger, droughts are known to have severely damaged unsuspecting cities as well as extremely prepared one. We will analyze through historical records what happened in the Atlanta drought, why they had to declare a water emergency, and how they plan to prevent it in the future. The results from these studies will then be applied and compared to the current water storage methods in Memphis. The effectiveness and appropriateness of Memphis' primary source of drinking water, the aquifer, will be discussed. We are examining whether Memphis would have stored an adequate amount of drinking water to avoid declaring a water emergency if it was faced with severe drought conditions. We believe that if Memphis were faced with a drought, similar to the one in Atlanta, the city will have stored a sufficient amount of drinking water to avoid declaring a water emergency.

### **#29 Using GIS to Model the Consequences of Global Climate Change**

Andrew Foss-Grant

Faculty Sponsor: Sarah Boyle, Department of Biology

Global climate change has already modified a large number of Earth's ecosystems, and its effect is projected to increase over the next century. Geographic Information Systems (GIS) provides an ideal way to track climatic variations and predict future consequences of this change. In this poster I focus on climate change over the next century in three key regions of the globe: undeveloped, developing, and developed. Specifically, I examine predicted climate models from the Intergovernmental Panel on Climate Change (IPCC) in Africa, China and India, and the United States. I compare these data with agricultural, demographic, and economic data from the different regions. The results indicate that Africa will likely encounter problems as low agricultural output and small economies conflict with increased drought and decreased precipitation. In developing nations, rapidly increasing populations are likely to conflict with decreasing water availability and shifts in the growing climate for crops. Finally, the United States, though economically suited to cope with changing climate, is predicted to face severe decreases in runoff as well as increased extreme weather, greatly affecting agricultural activity. Global climate change is predicted to affect all areas of the globe, but the determining factor as to how much it will affect human activity seems to be more closely tied to the economic status of the region.

### **#30 Behavioral Observations of Wild Orphaned Grizzly Bears in a New Captive Environment**

Lauren Lieb, Kelly Patton; Andy Kouba, Memphis Zoo

Faculty Sponsor: Sarah Boyle, Department of Biology

We aimed to provide a better understanding of how wild grizzly bear cubs (*Ursus arctos*) adjust to a captive environment. Three bear cubs were orphaned in the wild in July 2009, and subsequently were brought into captivity. The cubs first entered their outdoor exhibit at the Memphis Zoo on September 28, 2009. We documented their initial response to the exhibit, and collected behavioral data for six months. The bears exhibited a range of behaviors, but the greatest proportion of time was spent resting, swimming, and digging. They used all areas of the exhibit, including a sand pit, den, stream, and pool. The cubs also interacted with the public through a glass viewing area, and used enrichment items. No agonistic behaviors were noted. We conclude that the bears exhibited a range of behaviors and used multiple areas of their exhibit, but we suggest that behavioral monitoring continues as the cubs mature.

### **#31 Assessing Potential Conservation Threats to the Leatherback Sea Turtle (*Dermochelys coriacea*) in the Designated Critical Habitat of St. Croix**

Cybil Covic, Julia Goss

Faculty Sponsor: Sarah Boyle, Department of Biology

The majority of sea turtle species around the world are categorized as endangered by the International Union for Conservation of Nature (IUCN), and all five species of sea turtles inhabiting the Atlantic Ocean and Gulf of Mexico are listed as endangered. Their critical habitats have the potential to be threatened by multiple factors including: vessel traffic, increased human population density, anthropogenic effects such as global climate change and pollution, and state and federal regulations. We assessed the level of risks in the Leatherback sea turtle's (*Dermochelys coriacea*) critical habitat around St. Croix, U.S. Virgin Islands. We used a Geographic Information System (GIS) to overlay the critical habitat designated by the National Oceanic and Atmospheric Administration (NOAA) for the turtles, the industrial and recreational build-up on the island, human presence via proximity of roads to the shoreline and beach access. By examining the overlap of these potential threats to the Leatherback species

within its immediate critical habitat, we determined areas within and outside the designated critical habitat where more attention should be focused by turtle conservation groups and government agencies.

### **#32 Human-Elephant Conflict in Namibia**

Blaire O'Neal, Adam Alsamadisi

Faculty Sponsor: Sarah Boyle, Department of Biology

In Namibia, human population growth, land use changes, elephant mobility, and political and media manipulation have caused human-elephant conflict. Two factors that dictate where human and elephant populations live are proximity to water sources and avoidance of habitat disturbances, such as wildfires. For this GIS project, we combined field data on the distribution of elephant and human populations to determine the locations of conflicts. In addition, we researched the availability and distribution of water and the related carrying capacity of the land in Namibia. We hypothesize that (1) human-elephant conflicts are more frequent around water sources and less frequent around areas of wildfire disturbances, and (2) human populations are located on lands that have a higher carrying capacity, displacing the elephant population to areas with fewer resources.

### **#33 Ecosystem Analysis of Rhodes College Campus**

Carsen Bahn

Faculty Sponsor: Rosanna Cappellato, Department of Biology

During the spring 2010 a GIS-based Urban Ecosystem Analysis was conducted on Rhodes College campus. Using

**#36 The Edge-Effect s Influence on Soil Quality in Overton Park, Memphis, TN**

Charlie Ferebee, Tiara Brice

Faculty Sponsor: Rosanna Cappellato, Department of Biology

The objectives of this project were to determine whether the edge-effect influences soil quality in a forest ecosystem, and if so, to what degree. We will collect a total of 54 samples from three locations in Overton Park. We hypothesize that the edge-effect will influence soil quality because they are subjected to a different microclimate than the interior. We predict that soil nutrients and pH will be lower closer to the edge than closer to the interior of the forest. The results from this project will help us better understand the true effects that edge-effects has on soil quality, as well as vegetation distribution and composition of the forest in Overton Park, Memphis, TN.

**#37 Comparing the Effects of Acid Rain on pH, Dissolved Oxygen and Carbon Dioxide**

**q-642 18(s)33(il)70(5)-5()-5147 yth647, cr**





#### **#44 Environmental and Societal Effects of Logging in California**

Tory Adcock, Carrie Saracini

Faculty Sponsor: Jennifer Houghton, Department of Biology

The logging industry in California is primarily responsible for deforestation in that state. This deforestation has numerous consequences for the residents of California and others. In researching this project, runoff data from deforested areas were compared to data in areas of similar elevation and rainfall that have not been logged. This project also determined that deforestation has other negative impacts besides a possible increase in storm flow. Logging has been linked to soil erosion, which combined with flooding, can cause pollution to be spread. Deforestation has also been linked to global climate change, due to a decrease in repositories for CO<sub>2</sub>. Furthermore, the degradation of forests and the encroachment of humans into animal habitats can lead to the spread of infectious diseases and the introduction of new diseases to humans. Perhaps the most immediate danger of deforestation, though, is the increase in landslides in California, which leads to loss of property and life. Soil erosion also leads to increased pollution in soil and water. Our goal is to determine the impact of logging on the land and people of California.

#### **#45 Determining Ammonia Levels in Memphis**

Megan Cleary, Lib Davis

**#47 The Social Impacts of Draining Wetlands**

Matthew Isom

Faculty Sponsor: Jennifer Houghton, Department of Biology

Wetland losses have many impacts on the environment and the human societies around them. The aim of this project is to focus on the social aspects of draining wetlands, and to weigh the costs and benefits thereof. The data will be drawn from studies of the Everglades, an area extensively researched. It is expected that the costs will

### **#51 Water use Amongst Rhodes Students**

Ethan Stegich, Jake Minaldi

Faculty Sponsor: Jennifer Houghton, Department of Biology

In past years with changing climates it has become evident that in order to maintain the amount of water we have Rhodes College may need to make changes with water use. In order to do this we surveyed the Rhodes student population and used them as a model in order to see whether the student's water consumption. By evaluating the survey results we will be able to create a pattern on the consumption of Rhodes students to see how water consumption can be reduced and to see where students can be more efficient at Rhodes College. We surveyed a group of Rhodes students asking them the following questions: How often they go to the restroom a day, How many time they shower per day and how long, If they take baths or not , If they leave the water running while they brush their teeth, and how many times they do their laundry per week. With this information we were able to break down where most of the Rhodes water consumption comes from and we were able to form a pattern telling us whether water consumption by Rhodes students was greater on campus or off campus.

### **#52 Accuracy of Chlordane Extraction in Organic-rich Versus Organic-depleted Soils**

Jennifer Whatley

Faculty Sponsor: Jennifer Houghton, Department of Biology

The ch \_ a

**#55 HOPE VI: Hope or Homelessness?**



**#62 Memphis City Council**

Suzanne Zelenka

Faculty Sponsor: Arielle Goldberg, Department of Political Science

The racial tension in Memphis, and the separation of the two Super Districts, 8 and 9, have greatly shaped the way



**#25 Catalytically Inactive Caspase-8 Role in Tumor Cell Migration and Metastasis**

Maggie Meehan; Tal Tietz, J.M. Lahti, St. Jude Children's Research Hospital

Faculty Sponsor: Mary Miller, Department of Biology

Neuroblastoma is the most common extra cranial solid tumor in children, and Caspase-8 is frequently inactivated



**POSTER SESSION II (poster numbers precede titles)**

**Multisports forum, Bryan Campus Life Center, 4:00-5:30pm**

**Chemistry & Biochemistry and Molecular Biology**

**#7 A Comparison of Complete Basis Set Extrapolated CCSD(T) and DFT Methods for the Interaction Energies of Various Benzene and Borazine Dimers: The Role of Boronated Molecules in Cancer Treatment**

Liz Jeans

Faculty Sponsor: Mauricio Cafiero, Department of Chemistry

Recent work in our group has focused on ring-ring interactions in biological systems. We have shown that these interactions, which can include dispersion, induction, and other electrostatic forces, can be crucial to protein-ligand binding and nucleic acid-ligand binding. In the current work, we are studying boronated molecules, such as borazine and diborazine, to analyze their possible pharmacological applications. We have set up all possible t-shaped and sandwich complexes of combinations of benzene, borazine, diborazine (the boronated analogue of naphthalene), and naphthalene. The structures of the complexes were optimized using second order Moller Plessett Perturbation Theory (MP2) and the HCTH DFT Functional. Counterpoise-corrected interaction energies were calculated using, MP2, MP3, MP4, QCISD, CCSD(T), B3LYP, SVWN, and TPSS. The calculations were run using the 6-31+g\* and 6-311+g\* basis sets; we also used the correlation consistent basis sets to extrapolate a large-set-limit CCSD(T) interaction energy. Results showed, in general, that mixed pairs of boronated and non-boronated molecules, in both sandwich and t-shaped interactions, had the strongest binding energies. Of all the DFT methods, only the SVWN method showed the correct interactions both quantitatively and qualitatively. Pure non-boronated sandwich and t-shaped complexes are shown to have the weakest interactions. As boronated molecules see increased use in the medical field (such as in cancer therapy), we also show some preliminary work on boronated molecules in bio-molecular applications, such as Boron Neutron Capture Therapy. In BNCT, boron shows preferential uptake into the cell. We have set up t-shaped and sandwich complexes of octonal (representing the phospholipids in the cell membrane) with borazine and benzene dimers. As well, we have set up t-shaped and sandwich complexes of water (representing the plasma surrounding the cell) with borazine and benzene dimers. By calculating the interaction energies in these complexes, we can analyze BNCT and boron's preferential uptake into the cell during this process.

**#8 Ab Initio and DFT Calculations of Ligand-Nucleic Acid Binding Models**

Michelle Shroyer

Faculty Sponsor: Mauricio Cafiero, Department of Chemistry

Flat planar molecules called intercalants can bind to DNA. This binding can cause the DNA to deform or unwind, disrupting normal cellular function. This phenomenon called intercalation is responsible for carcinogenesis and also explains the action of some chemotherapeutic drugs. We have calculated structures and interaction energies for a model intercalant bound to nucleic acid base dimers (Ten total dimers including all possible pairings of Adenine, Guanine, Thymine, and Cytosine) in order to gain insight into the mode of action of intercalants. We optimized structures into sandwich structures and more deformed structures using B3lyp/6-31G. The counterpoise corrected interaction energies or calculated using mp2/6-31+g\* as well as mp2, b3lyp, and svwn using the 6-311+g\* basis set. Our preliminary results show that most DNA want to deform into a more T-shaped structure rather than a stacked sandwich structure implying how much DNA would want to unwind rather than just spread apart.

**#9 Fragment Based Design of Novel Cholesterol Moderating Drugs Using Ab Initio and DFT Methods**

Hunter Utkov, Allison Price

Faculty Sponsor: Mauricio Cafiero, Department of Chemistry

Statin Drugs mediate cholesterol levels by inhibiting the second step of the cholesterol biosynthesis pathway. In this rate-limiting step of the pathway, 3-hydroxy-3-methylglutaryl-coenzyme A (HMG-CoA) is reduced to mevalonic acid by the enzyme HMG-CoA reductase. The statin drug molecules displace the substrate HMG-CoA in the enzyme active site via competitive inhibition. We are investigating the weak binding forces involved in the binding of ligands to the enzyme HMG-CoA reductase in order to develop possible modifications to current statin drugs which may improve their ability to bind to the active site and inhibit the enzyme. We use correlated post-HF Ab

Initio as well as hybrid and local DFT methods to study important ring-ring type dispersion and induction interactions that are not currently exploited by statin drugs. We have shown that these interactions are important and contribute to binding with similar weight as hydrogen bonds and ion-dipole interactions. We have identified several functional groups and trends that seem to result in greatly increased binding of ligands to the enzyme. Using these trends we made four drug lead-candidates, optimized their structures in solution phase, docked them in the active site of the enzyme, and calculated interaction energies between the candidates and the active site using ONIOM. We believe that these novel drug molecules that take explicit advantage of these we-110(ms(512(s)14(W)-7(e ))T)-111(o(o)-5(f)8t(n)6

**#15 GDP-mannose Transporter Oligomer Formation in the Filamentous Fungus  
*Aspergillus nidulans***

Laura Johnson

Faculty Sponsor: Loretta Jackson-Hayes, Department of Chemistry

GDP-mannose transporters (Gmt) carry nucleotide sugars from the cytosol across the Golgi apparatus membrane in various eukaryotic organisms. Some fungal species like *Saccharomyces cerevisiae* express a single Gmt, while others including *A. nidulans* express two (GmtA and GmtB). GmtA and GmtB display a punctate pattern of distribution indicative of localization within the Golgi apparatus. Gmt in *S. cerevisiae* localizes to the Golgi as well, and proper localization is dependent on oligomerization. Here we report progress on determining if GmtA and GmtB form oligomers and the preferred combinations of GmtA and GmtB for Golgi localization. In addition, C- and N-terminal truncated versions of GmtA and GmtB were created in order to designate regions responsible for Golgi localization and possible oligomer formation.

**#16 COG Localization in *Aspergillus nidulans***

Kelsie Persaud, Sara Gremillion, Terry Hill, Darlene Loprete

Faculty Sponsor: Loretta Jackson-Hayes, Department of Chemistry

Fungi are a diverse group of organisms that play many roles in nature including decomposers, mutualists, and

## **Physics**

### **#12 Finding Paths with the Principle of Stationary Action**

Stan Badger

Faculty Sponsor: Shubho Banerjee, Department of Physics

The Principle of Stationary Action is a mechanical law that describes the possible paths that any projectile will take. In other words, when I apply this principle to a system—a 3-dimensional surface for example—I can obtain the equations of motion for that system. In plain English, if I am given a 3-dimensional surface and the starting and ending points for the projectile's motion, and I can use the principle of stationary action to determine equations that describe the possible paths that the object can take. For example, imagine a putting surface that is sloped or bumpy in some way. The surface has a specific starting point and ending point for the golf ball, but the actual path that the ball can take may be difficult to determine without the Principle of Stationary Action; with it, however, it is possible to figure out the path the ball will take, as well as the initial angle and initial velocity that should be applied. I have created a systematic way of determining the equations that describe a possible path on a surface, and I have explored several examples.

### **#13 Nuclear Structure of Palladium-101**

Nick Badger; A. Heinz, H. Ai, R. J. Casperson, B. Huber, J. D. LeBlanc, R. Luttke, E. A. McCutchan, J. Qian, B. Shoraka, J. K. Smith, J. R. Terry, J. L. Hugon, E. Williams

Faculty Sponsor: Deseree Meyer, Department of Physics

Palladium-101 lies in a region of atomic nuclei where the nucleus's structure can evolve from vibrational to rotational motion. In order to examine the nuclear structure of Palladium-101, an experiment was performed at the Wright Nuclear Structure Laboratory at Yale University using the ESTU-1 Tandem Van de Graaff Accelerator. A beam of 70 MeV Carbon-12 collided with Zirconium-92 nuclei to produce Palladium-101 and an additional three neutrons. Emitted gamma rays were detected by the SPEEDY array. By analyzing which gamma rays were detected at the same time as one another, we were able to confirm many nuclear energy levels and observe several new ones. Also, new connections between bands of energy levels have been discovered. The structure of Palladium-101 was then interpreted using the E-GOS (E-Gamma Over Spin) method, which is based only on experimental data. The E-GOS plot, created by graphing energies of gamma rays over spin versus spin, revealed a clear transition from vibrational structure to rotational structure.

## **Neuroscience**

### **#19 Localization of Neural Activation During Aggressive Behavior in the Brown Anole (*Anolis sagrei*)**

Emily Burford, Veronica Alix, Jason Ballard, Aaron Kala, David Siu

Faculty Sponsor: David Kabelik, Department of Biology

The neurotransmitters and neural pathways involved in the mechanisms of aggression are not yet understood. Dopamine and vasotocin (the nonmammalian homologue of vasopressin) are neurotransmitters associated with aggressive behaviors, however the method of their influence is not fully known. Anole lizards (E.g., the brown anole, *Anolis sagrei*) serve as excellent models for such behavioral neuroendocrinology studies as they often exhibit easily recognizable aggressive displays, and experience seasonal changes in hormones and behavioral activity levels that can be related to changes in the brain. Subjects of this species were allowed to interact in either a control encounter or an aggressive encounter, and their brains were harvested for analysis. By fluorescently tagging these neurotransmitters using immunocytochemistry techniques, we can examine neural activation during aggression, as indicated by colocalization with the immediate early gene product Fos. Further understanding the neurotransmitters employed in territorial and other forms of aggression and social interaction will provide insight into the complex mechanisms regulating behavioral expression. Considering that the neurotransmitter systems involved in such regulations and responses are conserved across terrestrial vertebrates, these studies will allow for a more complete understanding of aggression and related social interactions not specific to *Anolis* alone.

**#20 The Protective Effects of Exercise Against Chronic Restraint Stress-Induced Apoptosis in the Mouse Cortex and Hippocampus**

Sarah Allen, Anna Kolobova, Jessie Pearson

Faculty Sponsor: Kim Gerecke, Department of Psychology

Chronic restraint stress has been shown to cause deleterious effects on the hippocampus through chronic elevation of glucocorticoids. Excess levels of glucocorticoids leave neurons vulnerable to other toxic insults such as oxidative stress, which may lead to apoptosis (programmed cell death). This process has been implicated in all neurodegenerative events, including Parkinson's and Alzheimer's diseases. Exercise has been shown to protect against the harmful effects of oxidative stress and therefore decrease markers for apoptosis. In this experiment, we examined the protective effects of exercise against chronic restraint stress in the mouse hippocampus and cortex. Mice were divided into two housing groups: standard housing and exercise. Half of the animals in each housing group were chronically stressed for 2 hours per day for 14 consecutive days. Animals were sacrificed 1 hour and 24

**#29 Does Caffeine Improve Attention by Improving Filtering in the Brain?**

Perry Person, Sarah Eldridge, Kelly Coney

Faculty Sponsor: Jeffrey Sable, Department of Psychology

The belief that caffeine enhances attention seems to be a common one among college students. In order to test the

### **#24 Role of Numb in Granule Cell Migration during Cerebellar Development**

Evan Tyler; Jakub Famulski, David Solecki, St. Jude Children's Research Hospital

Faculty Sponsor: Kim Gerecke, Department of Psychology

The cerebellum has long served as a model for the study of neuronal migration, and defects in cerebellar migration have been linked to numerous medical conditions, including medulloblastomas. In the cerebellum, granule neurons migrate inward from the external granule layer (EGL) to form deeper cellular layers by attaching to and moving along glial processes. The PAR complex, consisting of Par6, Par3, aPKC, and other proteins, serves several functions in glial-guided migration. In fact, when the PAR complex is disrupted, migration is inhibited. Siah is an ubiquitin ligase that targets Par3 for degradation and, therefore, inhibits migration. Another target of Siah is Numb, a protein with some known roles in neurogenesis. Interestingly, Numb is thought to interact with Par3. We hypothesized that Numb and Siah would provide dynamic regulation of PAR complex stability. To explore this possibility, cerebella of P8 mice were transfected to over-express Siah or Siah and Numb. After 48 hours, slices of each cerebellum were examined to measure migration distances for individual granule neurons. Preliminary results indicate that the simultaneous over-expression of Numb with Siah at least partially rescues migration. This suggests that Numb is necessary for proper migration, but the mechanisms through which it functions remain unclear.

### **#25 Catalytically Inactive Caspase-8 Role in Tumor Cell Migration and Metastasis**

Maggie Meehan; Tal Tietz, J.M. Lahti, St. Jude Children's Research Hospital

Faculty Sponsor: Mary Miller, Department of Biology

Neuroblastoma is the most common extra cranial solid tumor in children, and Caspase-8 is frequently inactivated through DNA methylation or gene deletion in neuroblastoma tumor cells. Though Caspase-8 is a key protease in Fas induced apoptosis, its presence has been shown to aid in cell motility and metastasis in nonapoptotic cells by promoting cell motility through its recruitment to the focal adhesion complex, enhancing cleavage of focal adhesion substrates, and thus cell migration. This project aims to investigate the role of caspase-8 in the motility, adhesions, and metastasis of neuroblastoma tumor cells. Specifically it asks if Caspase-8 catalytic activity is necessary for its role in enhancing cell migration. Site directed mutagenesis was performed on regulatory site Y380 to produce Y380E and Y380F mutants. The mutant DNA was then cloned into retrovirus vectors, and the viruses expressing these mutants were produced and used to infect cell lines derived from neuroblastoma patients. The effects of the caspase-8 mutants on tumor cell proliferation, apoptosis, and metastasis were examined.

**#27 Defining the Role of Human Zinc-finger Antiviral Protein in Influenza Virus Infection**



**#38 The Effect of Salinity on Osmoregulation Demonstrated by Crayfish Activity**

Natalie Darar, Shruti Patil, Allie Dillon

Faculty Sponsor: David Kesler, Department of Biology

**#39 Effect of Pesticides on Stomal Apertures**

Mae Gillespie, Kathy Marr, Chris Perkins, Harrison Daniel

Faculty Sponsor: David Kesler, Department of Biology

**#40 Stomata Density s Dependence on Leaf Height in *Arabidopsis thaliana***

**#50 Effect of Metabolic Stressors on Crayfish Aggression**

Shyretha Johnson, Talor Paige, Kate Stewart, Xiao Wang  
Faculty Sponsor: David Kabelik, Department of Biology

**#51 Antagonistic Behavior of Two Crayfish in the Presence of Shelter**

Vy Nguyen, Huy Vi Spencer Friedrich  
Faculty Sponsor: David Kabelik, Department of Biology

**#52 Trends of Male Crayfish Aggression**

Ryan Conley, Rikeen Patel

## **Biology**

### **#58 Analysis of Seipin Expression in the Mouse and Construction of a Targeting Vector for the Generation of a Mouse Model of Spastic Paraplegia 17**

Khang Dang; Ioannis Dragatsis, University of Tennessee Health Science Center

Faculty Sponsor: Rosanna Cappellato, Department of Biology

The purpose of my research is to analyze the expression of seipin in the mouse and to work towards developing a mouse model for Spastic Paraplegia 17 (SPG17). Mutations in the BSCL-2 (Berardinelli-Seip congenital lipodystrophy type 2) gene in humans are associated with two devastating disorders: Congenital Generalized Lipodystrophy type 2 and Spastic Paraplegia 17. BSCL-2 is located in human chromosome 11, contains 11 exons, and encodes a 398 aminoacid protein, called seipin. Aminoacid substitutions that disrupt glycosylation of the seipin cause autosomal dominant Spastic Paraplegia. SPG17 (also called Silver Syndrome, Silver Spastic Paraplegia Syndrome, or Spastic Paraplegia with Amyotrophy of Hands and Feet) is characterized by muscle weakness and atrophy of the upper and lower limbs. In the mouse, the BSCL2 gene homolog is located in chromosome 19 and has 87% identity to the human gene. There is currently no animal model for SPG17 and no information of the pattern of expression of seipin in the mouse. I analyzed the amount of expression of seipin and its localization in different organs in mice. I accomplished this by performing RT-PCR in total RNA from several adult organs and tissues, and from embryos at different stages. I had begun to generate a targeting vector that carries one of the aminoacid substitutions associated with SPG-17. For this, I have PCR-amplified genomic sequences that encompass this region to generate the mutation with site-directed mutagenesis.

### **#59 G1 Cyclin Cln3 is Dependent Upon NPL3, a Gene Required for Nuclear Export of mRNA in *Saccharomyces cerevisiae***

Lindsey Bierle

Faculty Sponsor: Mary Miller, Department of Biology

stained with a ProQ Diamond phosphoprotein specific stain and a Krypton total protein stain. The data was subjected to a one way Analysis of Variance (ANOVA) followed by hierarchical clustering to identify proteins and phosphorylated proteins that were differentially expressed between the three strains. Results from the protein staining indicated that 212 proteins were differentially expressed between NOD and C57 (control) mice, and 118 phosphorylated proteins were differentially expressed between the NOD and C57 (control) mice.

### **#61 True Blood: Hematological Comparison Between Wild and Captive Reptiles**

Anna Johnson, Cybil Covic

Faculty Sponsor: Jon Davis, Department of Biology

Blood composition is crucial to proper immune function, energetics, and osmoregulation, among other processes.

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