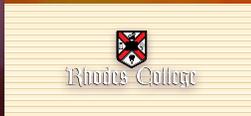




UNDERGRADUATE RESEARCH and CREATIVE ACTIVITY SYMPOSIUM 2011



APRIL 29, 2011

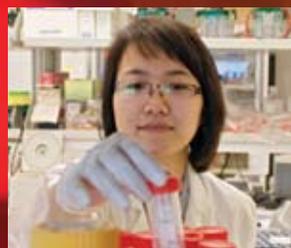
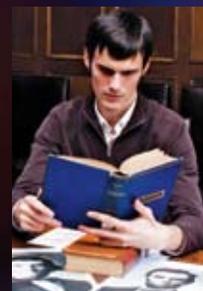


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Presentation Sessions & Locations

10:45 am

Highlights of the Rhodes Fellowships Program (-12:15pm), Blount Auditorium
[refreshments preceding session in Buckman Lobby]

1:00 pm

Connecting Communities through Music in the Delta (-1:40pm), Frazier Jelke C
Research in the Social Sciences (-1:45pm), Kennedy 208
Heroism and Virgil (-1:45pm), Palmer 207
Vietnam and Aftermath (-2:00pm), Palmer 208
Human Rights (-2:15pm), Palmer 205
St. Jude Summer Plus Fellowship (-2:15pm), Frazier Jelke B
Research in Economics(-2:30pm), Kennedy 205
Conservation and the Environment (-2:30pm), Frazier Jelke A
Ethnography at Home (-6:00pm), Kennedy 201

2:00 pm

King Biscuit Blues Fellowship (-2:40pm), Frazier Jelke C
Early American Literature (-2:45pm), Palmer 207
Research in Anthropology and Sociology (-4:30pm), Kennedy 208

2:15 pm

Art, Reconsidered (-3:15pm), Palmer 208

2:30 pm

Nationality and Gender Conflicts in Hispanic Literature (-3:30pm), Palmer 205
Quantitative and Computational Science (-4:30pm), Frazier Jelke B

2:45 pm

Genetics, Biochemistry and Molecular Biology (-4:00pm), Frazier Jelke A
Buckman Fellowship (-4:15pm), Kennedy 205

3:00 pm

Classical Literature (-3:45pm), Palmer 207
Historical and Cultural Iconography in Art and Theater (-5:00pm), Frazier Jelke C

3:30 pm

Critical Essay in the Humanities (-4:30pm), Palmer 208

3:45 pm

Hispanic Literature Under Dictatorships (-4:45pm), Palmer 205

4:00 pm

The Search for Values in Light of Western History and Religion (-4:45pm), Palmer 207

4:30 pm

Student Films: Sixteen New Ways of Viewing the World (-6:15pm), Frazier Jelke B
Poster Session & Concluding Reception (-6:15pm), Multi-sports forum of the Bryan Campus Life Center

Other Special Events

April 29th, 5:30pm – 8:30pm

Gallery Showing, "Unsheltered: Unseen"

409 S. Main, Memphis TN

Justin Deere

Unsheltered: Unseen is a project that aims to build the Memphis community while empowering it through artistic expression. Our goal is to help Memphians better understand the lives of those who are experiencing homelessness. We hope to also bridge the gap from someone who sees the world of homelessness to someone who only sees panhandlers. The project is simple: We offer disposable cameras to a minority crowd and ask participants to share their view and unique perspective of Memphis. We hope to expose unseen and obscure perspectives into a world many may have never seen before. In doing so, their images can be a catalyst for change and promote discussion on homelessness and panhandling in our community. If nothing else, we hope even partly that the project can re-humanize a population which has seemingly been marginalized down to a "homeless problem." We are showcasing artists' work for an opportunity to inform, diversify and build bridges in our Memphis. This gallery showcase exposed the photos to approximately 350 people and raised nearly 800 dollars towards homelessness and hunger ministries in the Memphis community.

April 30th, noon

Unveiling, "Public Sculpture on the Greenline"

Vollintine & Evergreen Greenline at N. Parkway between Stonewall St. and N. Watkins St.

Megan Barzizza, Hannah Bromfield, Jess Burnam, Andrew Caldwell, Laurie Clotworthy, Ryan Conley, Rachel Connell, Justin Deere, Megg Doolin, Katie Flynt, Della Hebert, Sarah Pate, Johnathan Payne, Natalie Rolwes, Graham Smart, Jacob Smith, Charlotte Watson, George Williford
Professor Ben Butler's class "Art 166: Public Art" will unveil their sculpture on the west end of the Vollintine & Evergreen Greenline. An unveiling party, hosted by Rhodes CODA program will accompany it and the neighborhood's "Walk the Line" ice cream event.

Acknowledgements

**This event made possible by Rhodes College and the efforts of the
2011 URCAS Planning Committee**

Bette Ackerman, Assoc. Prof.
Gordon Bigelow, Assoc. Prof.
Nikki Cannon-Rech, Infrm. Servs. Librarian
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Jeff Sable, Asst. Prof.
Roberto de la Salud Bea, Asst. Prof.
Robert Seals, Asst. Director, Campus Safety
Karen Thomas, Dept. Assistant, Biology
Katie White, Asst. Prof.
Catesby Yant, Instructor
Ann Viano*, Assoc. Prof.
*chair, URCAS planning committee

 **HIGHLIGHTS OF THE RHODES FELLOWSHIPS PROGRAM**

Blount Auditorium, 10:45am – 12:15pm

Session Chair: Scott Garner, Director of Fellowships

Internship

Quality Control of Ghost River Brewery's Beer

Catherine Bordelon; Chuck Skypeck, and Jimmy Randall, Ghost River Brewery

Faculty Sponsor: Laura Luque de Johnson and Terry Hill, Department of Biology

Microbrewing, a method of small scale beer production, uses traditional brewing ingredients and procedures. Ghost River Brewery, a Memphis microbrewery, currently lacks a method of quality control of their beer. Because the beer is so quickly consumed, quality control has not been an issue. However, to bottle beer, quality control procedures must be established to ensure a consistent and safe product. Our initial step was to determine if the beer product was contaminated and to identify potential sources of contaminants. Samples of the brewery's beer were obtained at different stages of the brewing process and tested for the presence of contaminating bacteria using selective media for common beer contaminants. In addition, samples of the water, air, the stone aerator, and zwickels (sampling faucets) were tested on unselective media and selective media. Bacteria found growing on the selective media were further characterized for genus identification. Our analysis found that the beer is clear of contaminants. However, there are common beer contaminants in the air and zwickels of the brewery. Establishing a quality control will provide the Ghost River Brewery a standardized protocol to generate a consistent product that will retain its flavor and will be safe to the public.

Student Research

Medulloblastoma Subtypes and Spatial Localization

Amber Owens, Rhodes College; Robert Ogg, Matthew Scoggins, Melissa Jones, Department of Radiological Sciences, St. Jude Children's Research Hospital

Faculty Sponsor: Jeffrey Sable, Department of Psychology

Medulloblastomas are the most common form of childhood brain cancers and occur in the cerebellum. There are many subtypes of medulloblastomas, with a lot of variation dependent on the cellular origin of the tumor cells. The greatest pathway contributing to medulloblastomas is the Sonic Hedgehog pathway constituting 25% of medulloblastomas. Treatment of medulloblastomas is currently standardized and does not vary according to subtype. Interestingly, recent studies have shown that the various subtypes are so significantly different they could warrant different diseases. In addition to considering the genetic and histological differences in medulloblastoma subtypes, our recent work has focused on the spatial localization of various subtypes in attempt to determine whether certain subtypes are not actually arising from the cerebellum but instead infiltrate the cerebellum after developing in the fourth ventricle and ependymal cells. The extreme points of the tumor and center of the tumor are compared to landmark points within a normalized brain. Preliminary results show that there may in fact be spatial differences in the subtypes that may lead to considering a different treatment plan for subtype groups.

Study Abroad

El Pibe de Oro: Diego Maradona's status as an idol and what this reveals about the cultural values of Argentina

Andy McGeoch

Faculty Sponsor: Steve Ceccoli, Department of International Studies

In Argentina, Diego Maradona is treated as a living god. This presentation introduces Argentinean soccer icon Diego Maradona and what his character continues to reveal about Argentinean cultural values. The presentation will explain how Maradona achieved and maintains his status as an idol despite his many imperfections. This backdrop provides a context for how he exemplifies both the incredibly beautiful and the confoundingly unattractive sides of Argentina's culture. In the process of looking at this culture, I attempt to elucidate the meaning of the term "pibe" and how this relates to the continuing impact of Maradona on his country. In sum, I argue that a better understanding of the character of Diego Maradona can lead to a better understanding of Argentina as a whole.

Civic Engagement / Service

The Ruka: Rhodes' First Intentional Community

Jami King, Maggie Rector, Leigh DeVries, Shelby Kramer, Sarah Dockery, Catherine Appleton

Faculty Sponsor: Bernadette McNary-Zak, Department of Religious Studies

This presentation will explore the history of intentional communities and its impact on the founding and execution of Rhodes' first intentional community, The Ruka. We will discuss the way in which this fellowship opportunity provided through the college has allowed for the members to engage in service-learning on a daily basis and come to recognize the intersection of academic pursuit and community engagement. This initiative extends to a focus on household sustainability. At its most basic, the Ruka exists as six individuals living intentionally with the common goals of engaging with one another, the effort to sustain our planet, and service to the greater Memphis community. Our service is focused at Caritas Village, a local community center and coffee shop in the Binghamton neighborhood. Our presentation aims to situate the community within its historical context and explore the inspirations behind the project and its day-to-day execution in the lives of Rhodes students.

Creative Activity

The Making of Lester Middle School Photography Club

Kelly Parry

Faculty Sponsor: Liz Daggett, Department of Art

This semester, a photography club at Lester Middle School was started with the help of some motivated volunteers and the generous support of CODA. Everything from the application process to the field trip destinations to the celebratory end of semester plans were created from scratch with the help of teachers at Lester and students from Rhodes. Students at Lester learned about how cameras worked, how to take better pictures, and how to respect their surroundings through developing the eye of a photographer. They were able to take trips and see parts of Memphis that, while only miles away, would never have been seen otherwise by many of the children. Lessons in responsibility were learned when the cameras were taken home and lessons of acceptance were learned thought the semester as the students in the photo club became friends across social lines. Hopefully, this program can be used as a model that could be implemented at other schools should the funding exist. This presentation will take listeners through the process of creating the program and will share photos from the members of the Lester Middle School Photography Club.

FINE ARTS ORAL SESSIONS

Connecting Communities Through Music in the Delta

Frazier Jelke C, 1:00pm – 1:40pm

Session Chair: Stephanie Milazzo

1:00



Guitar Club

Daniel Gilham

Faculty Sponsor: John Bass, Department of Music

We are nearing the end of our second full semester of teaching guitar to students at Cypress Middle School. Working in conjunction with John Bass, Director of the Mike Curb Institute, a number of Rhodes students and an '10 alumni, Parker Davis, have added a musical offering to the already bustling learning corridor between Rhodes and a number of affiliated schools in the area. Our program involves instruction on basic music theory and reading, guitar chords, and single note melodies. By providing a bi-weekly after-school activity for young students, we hope to foster a love and appreciation for music while stimulating the analytic and artistic skills necessary for musical performance, comprehension, and expression. Beyond guitar instruction, our partnership with Cypress Middle has involved a number of field trips to expose the students to professional musicians, the most recent of which being a performance by a jazz and chamber group, the Inventions Trio. Guitar club has been an excellent opportunity to



serve a nearby school through mentoring talented students in music, an oft-neglected area of study. As a college committed to holistic learning, guitar club is a manifestation of our school's educational philosophy in the community.

1:20

"All Shook Up": Elvis's Impact on Memphis Music and Audubon Park

Nicole Baker, Josie Holland

Faculty Sponsor: John Bass, Department of Music

Since the early 1900s, Memphis's diverse population has cultivated an array of musical genres and traditions, including blues, jazz, gospel, rock and soul, and country music. Several leading musicians in these and other genres have recorded their music in Memphis starting in the mid-20th century. Once Elvis Presley hit the scene in the 1950s, his fame brought new attention to music in Memphis. Focus is often directed at Elvis's rise to fame and the ups and downs of his musical career, while Memphis functions as a setting for his narrative. The focus of our research is the impact of Elvis's career on music in Memphis. How were other genres and musicians affected by his fame? In parallel, we also explore the impact of Elvis's presence within the neighborhood of his first house in Memphis. While he only lived in Audubon Park for about a year, how did other members of this community respond to Elvis, his fame, and his fans?



The King Biscuit Blues Fellowship

Frazier Jelke C, 2:00pm – 2:40pm

Session Chair: Joshua Fuchs

2:00-2:40

Living the Blues: A Performance and Presentation by the King Biscuit Fellows

Tanner Evins, Anson Jeng, Emily Main, Alex Piazza, Michael Todd, Ben Walsh

Faculty Sponsor: John Bass, Department of Music

This presentation features a discussion of blues music and showcases the musical talents and upbringings of the King Biscuit Fellows. The fellows traveled to the Arkansas Blues & Heritage Festival in Helena in October 2010 to discuss and perform blues music. A recapitulation of that presentation is presented here. There is special emphasis on the musical interests and tastes of the individual fellows. Each fellow has a presentation and performance reflecting said interests while also discussing and incorporating blues elements relevant to the performance. Topics explored are: New Orleans music, presented by Alex Piazza; jazz and blues, presented by Tanner Evins; blues in metal music, presented by Michael Todd; women and the blues, presented by Emily Main; and blues and rock & roll, presented by Ben Walsh. Respective tunes for these topics are "Limehouse Blues," "Misty," "When the Levee Breaks," "St. Louis Blues," and "Burnin' Love."

Historical and Cultural Iconography in Art and Theatre

Frazier Jelke C, 3:00pm – 5:00pm

Session Chair: Nick Badger

3:00

Re-examining the Iconography of The Alfred Jewel

Emily Wehby

Faculty Sponsor: Victor Coonin, Department of Art

The Alfred Jewel is one of the most famous yet controversial objects from 9th-century England. Now in the Ashmolean Museum, Oxford, this decorated gold object of unknown purpose was made during the reign of King Alfred. The central figure, in enamel under rock crystal, has been variously identified as Christ, Alfred, or a personification of sight. However, by investigating the Jewel's iconography in the context of High Crosses and



illuminated manuscripts, a new case is made for the identification as Christ. In addition, by examining primary sources and similar artifacts, its purpose can be determined as a pointer for reading manuscripts.

3:20

Skeletons in the Closet: Andy Warhol's Self-Portraits

Jacob Smith

Faculty Sponsor: David McCarthy, Department of Art

In considering the prolific output of Andy Warhol, one of America's most popular and celebrated artists, much attention has been given to his portraits of the rich, the famous, the beautiful, and the dead. But a fascinating subcategory of these artworks is the self-portrait, the hundreds of images Warhol made of himself. Whether streaked with camouflage paint or disguised in drag, Warhol's self-portraits amount to a critical examination of the visual construction of gendered identity and of the motivations of the preeminent Pop artist himself. Taking into account issues of the closet, queering, and the body, I argue that acknowledging Warhol's identity as a homosexual is essential to a complete understanding of the artist and his work. Warhol's sexual identity did not only inform his practice; it is inconceivable without the perspective that his life as a gay man in mid-century America provided him. His self-portraits, in which Warhol reflects directly on his own identity through visual form, offer the clearest and most conclusive evidence of his willful, insightful subversion.

3:40

Gender and Domesticity in Roy Lichtenstein's Girls Series

Olivia Wood

Faculty Sponsor: David McCarthy, Department of Art

In 1961, the Pop artist Roy Lichtenstein began his famous Girls series. This series continued until 1966 and became an iconic component of his work. They featured his signature style associated with commercial art and Pop art, including Ben Day dots, stenciling, and simplicity in subject, color, and line. The Girls series also acted as an outlet for the artist during the tumultuous years of his separation and divorce from his first wife Isabel. In this paper I explore Lichtenstein's Girls series through the framework of the interpretation introduced by scholar Bradford Collins in his essay, "Modern Romance: Lichtenstein's Comic Book Paintings". Collins introduces a biographical context, including Lichtenstein's marital problems, as a way of understanding his paintings. Lichtenstein's personal life is essential to understanding the Girls series and also serves as a way to understand the paintings in a cultural context. In his series, Lichtenstein draws from mass culture such as comic books and popular cinema his portrayal of women. By using the gendered iconography of the 1950's, Lichtenstein explored mainstream American stereotypes of beauty, commented on the conventions of domesticity, and worked within the traditional subject matter of Western painting.

4:00

Bridging the Gap: How the Works of John Cage, Robert Rauschenberg, and Andy Warhol Developed the Pop Sensibility

Amy Bower

Faculty Sponsor: David McCarthy, Department of Art

What is Pop Art? It was the use of commercial art as subject matter. It was Industrialism. It was the American Dream. For Andy Warhol, it was John Cage. In a 1963 Art News interview with Gene R. Swenson, Andy Warhol stated, "It's funny the way things change. I think John Cage has been very influential..." This simple statement from the famous discussion defining "What is Pop?" provided a basis for finding and understanding the Warholian aesthetic of the 1960s. In his works, celebrated Pop artist Warhol utilized new mediums, design, and theory in a controversial approach to production that helped to revolutionize the world of art. These advancements can be linked with contemporary composer and thinker John Cage, in accordance with the works of Robert Rauschenberg. Each unified many of the principles that were crucial to the development of the Pop sensibility, notably the separation of the artist's hand, utilization of the banal, simplified coloration, repetition, and seriality. Through Cage's conversations redefining his judgments of aesthetics, as well as his musical and visual compositions, audiences can draw parallels to Warhol's innovative production techniques as they emerged in visual response to the high modernist perspectives of the previous generation.

4:20



Aurgonautica: An Inside look at the Chatterbox Audio Theatre process

Thomas Harless

Faculty Sponsor: Liz Daggett, Department of Art

I will be presenting on Chatterbox's recent production of Aurgonautica. I assistant directed the show, which was staged live in the McCoy Theatre. The show was a dramatic retelling of the story of Jason and the Argonauts. I will present on my involvement with Chatterbox and work with the show, from auditions to post production work.

4:40

The Big Kids: Public Sculpture on the Greenline

Megan Barzizza, Hannah Bromfield, Jess Burnam, Andrew Caldwell, Laurie Clotworthy, Ryan Conley, Rachel Connell, Justin Deere, Megg Doolin, Katie Flynt, Della Hebert, Sarah Pate, Johnathan Payne, Natalie Rolwes, Graham Smart, Jacob Smith, Charlotte Watson, George Williford

Faculty Sponsor: Ben Butler, Department of Art

Students in Professor Butler's Public Art course have created a permanent public sculpture for the nearby V&E Greenline. Each student developed a proposal in response to the site, and the winning proposal chosen by the Greenline committee was fabricated by the entire class. The process, from initial sketch, through model making, material testing, fabrication and installation, has been documented. Members of the class will present their "making of" video as a preview to the unveiling of the sculpture on April 30th.

Student Films: Sixteen New Ways of Viewing the World

Frazier-Jelke B, 4:45pm - 6:15pm

Session Chair: Liz Daggett

Amy Aughinbaugh, Kalen Axam, David Becker, Jessica Cowan, Leila Farahani, Anna Gladfelter, Sydney Howard, Shyretha Johnson, Sarah Lavatai, Mallory Morphy, Fernando Perez Serrano, Nguyen Huong Pham, Adam Rivkin, Emma Fiandt, Elliott "EJ" Juchheim, Ben Morris

Faculty Sponsor: Liz Daggett, Department of Art

Grab some fresh popcorn and be ready to see sixteen short student films in an hour and a half! In ART 166/366 Digital Art: Moving Images, students learn how to make animated, narrative, experimental, and documentary films, and then are asked to make a more in-depth final project of their choosing, dealing with all of the aesthetic, logistical, technical, ethical, and philosophical issues that then arise. These final projects – a mix of animated, music video, experimental, narrative, and documentary films – will amaze, shock, and entertain you.



HUMANITIES ORAL SESSIONS

Human Rights

Palmer 205, 1:00pm – 2:15pm

Session Chair: Sarah Endres

1:00

Human versus Civil Rights: Exploring the Right to Marry in the LGBT Community

Rush Brady

Faculty Sponsor: Leigh Johnson, Department of Philosophy

This documentary film, created in Dr. Leigh Johnson's Philosophy 401 class Humanism and Human Rights, explores the right to marriage in the lesbian, gay, bisexual, and transgendered community and, with the implications of church and religion, in the religious community. Within the film, I hope to accomplish two main goals: first, to identify the main arguments both for and against specifically gay marriage, and second, to more clearly present the case of marriage as either a human or civil right. My film is composed of interview footage, primarily from talks with students and faculty from Rhodes, from individuals at the Memphis Gay and Lesbian Community Center, and from the larger Memphis community as well.

1:15

Inalienable Human Rights and the Destitute of Memphis

Cole Bradley, Ryley Erhardt

Faculty Sponsor: Leigh Johnson, Department of Philosophy

"In the Universal Declaration of Human Rights, the United Nations has stated in clear and simple terms the rights which belong equally to every person. These Rights Belong to you" (UDHR, preamble). As a charter member and one of five permanent members of the United Nations, the United States proudly endorses the Universal Declaration of Human Rights, and entitles its full citizenry to the fundamental and inalienable rights outlined therein. Yet how is it that in a nation so firmly grounded in equality for all, we permit violations of our some of our fellow citizens' most basic human rights? According to the Universal Declaration of Human Rights, human rights are inherent and free. Then why is it that America's most impoverished class also suffers from more human rights violations than any other American? Many bums remain forever outsiders to our society, spited constantly by their own reflection. Article 3 guarantees security of person and Article 5 prohibits inhuman or degrading treatment. Our mission is to document basic human rights violations regarding the impoverished of Memphis. Specifically, we will examine the degree to which the city of Memphis protects rights of the impoverished and whether or not society treats them humanely.

1:30

A Human Rights Lens on the Ethics of Physician-Assisted Suicide

Shannon Fuller, Liz Fieser, Stephen Spainhour

Faculty Sponsor: Leigh Johnson, Department of Philosophy

In the case of terminal illness, is the denial of access to physician-assisted suicide a human rights violation? Or does the practice of physician-assisted suicide conflict with human rights discourse? For our Philosophy 401 course: Humanism and Human Rights, we have created a documentary film that explores the issue of "right to death" versus "right to life." Our purpose in creating this film is not necessarily to say what is morally justifiable and what is not, but rather to provoke thought and discussion, in addition to guiding the viewer through the philosophical arguments surrounding the topic. We will close the 10-minute film presentation with a Q&A session.

1:45

Racism in Memphis Schools: The History, Philosophy and Current Events

Manali Kulkarni, Courtney Martin, Sarah Dockery

Faculty Sponsor: Leigh Johnson, Department of Philosophy

Our documentary for our Human Rights class, about racism in the current Memphis School system, expresses racism and discrimination as a violation of basic human rights. It is divided into three parts. Part one is on the Philosophy of Education, which lays out the basic philosophies of Plato, Immanuel Kant, John Dewey, and Jane Addams. The purpose of this section on the philosophy of education is to provide a continuum and overarching understanding of the theories behind the motives of educating all students and the role that various races and ethnicities play in education system. Part two, on the History of Discrimination in Public School Systems, explains the history behind the racism in the Public School system as a whole. It explains the continuum of history from Thomas Jefferson's idea of starting a public school system to the groundbreaking case of *Brown v. Board*. Part three is titled Education and Racism: Memphis School Systems, which focuses on racism in the educational system of the city of Memphis by employing our perception of impoverished educational systems as furthering racial discrimination. In conclusion, we include interviews with various community members, from the Mayor to Rhodes students, regarding racism in Memphis schools today.

2:00

HIV/AIDS, Human Rights, and Access to Justice

Stephen D. Spainhour

Faculty Sponsor: Leigh Johnson, Department of Philosophy

The incidence and spread of HIV/AIDS are disproportionately high among groups who already suffer from a lack of human rights protection, and experience discrimination. This includes groups that have been marginalized collectively, culturally and economically. Having HIV/AIDS often leads to shame, isolation and denial, and fear of what may happen deters individuals from being tested, naturally catalyzing the epidemic. According to the U.S. Centers for Disease Control and Prevention (CDC), it is estimated that one in every five people living with HIV have not had their infection diagnosed, much less reported. Systemic abuses of the right to be free from prejudice, the right to avoidance and prevention, treatment and care, the right to physical and mental veracity, and the right to freely receive and impart information not only aggravate the increase of HIV/AIDS, but also promote a perambulation whereby people suspected of being infected with HIV are subject to further human rights abuses. The goal of this paper is to thoughtfully point out discrepancies between the way current HIV/AIDS patients are treated in our society and the language utilized in the Universal Declaration of Human Rights.

Heroism and Virgil

Palmer 207, 1:00pm – 1:45pm

Session Chair: Matt Miller

1:00

Divinity Underscores the Height of Human Achievement

Allison Greene

Faculty Sponsor: Gail Murray, Department of History

The history of the Trojan people, beginning with Troy's disintegration in the *Iliad* and continuing in Virgil's *Aeneid*, illumines two types of Trojan heroism. In the Greek epic there exists a frenzied, ambivalent Zeus, while in the Roman epic, which pays homage to Augustus, Jupiter exists moderately and detachedly. Zeus' continual, ambivalent interference causes frenzy amongst both armies, but it specifically underscores the Trojan heroes' inability to overcome divine whim. Despite their valor, the Trojan warriors are unable to cope against the ultimately antagonistic Zeus, emphasizing the limits of mortality. Conversely, Jupiter's detachment from Aeneas' struggle against Juno accentuates Aeneas' strength despite his mortality. In the Roman epic, his ability to retrieve his destiny despite Juno's wrath and little help from Jupiter depicts a different sort of hero. Aeneas as an allegory of Augustus unveils a motive for Virgil's uncharacteristic portrayal of mortality and a less impetuous chief deity. By removing

most divine interference on behalf of Aeneas, Virgil depicts him (and therefore Augustus) as a leader with powers surpassing those of previous Trojan heroes, like Hector.

1:15

Classical Values in an Unlikely Hero

Hunter Hallman

Faculty Sponsor: Gail Murray, Department of History

Virgil's epic, the Aeneid, explores the classically Roman values of loyalty, selflessness, bravery, and piety. These are hardly original attributions to a hero – however, Aeneas is not just an idol. He is the embodiment of the foundation of the entire Roman line, right down to Augustus himself, leader of the newly formed Roman Empire. With this new reign comes a new breed of hero – Aeneas is not like his predecessors in other epics, those who destroy for the sake of destruction: Virgil sets him distinctly apart with the depth of which he feels, and the terrible sacrifices he makes for a race of people to come after him. This paper explores how Virgil interprets classical Roman values through the medium of characterization of Aeneas. It will analyze the extent to which this interpretation of Aeneas represents Virgil's reflection of these values onto Augustus himself. It also examines the use of rhetoric, dialogue, and narration that Virgil uses to invoke empathy with his audience and to justify Aeneas to the Romans as their patriarch, and Augustus as their leader.

1:30

Redefining the Roman Hero in Virgil's Aeneid

Samantha Smith

Faculty Sponsor: Gail Murray, Department of History

This paper proposes an argument constructed from textual analysis and a synthesis of scholarly articles addressing Virgil's depiction of Turnus and Aeneas in the Aeneid. This paper posits that Virgil's emphasis on Turnus' selfishness, rage, and bloodlust contrasted with his depiction of Aeneas' selflessness, self-control, and piety stems from the author's comprehension of the changing definition of hero by the Roman populous. These different characteristics serve not only to partition Virgil's two warring characters but also to portray the conflict between Turnus and Aeneas as an ideological battle between heroes who embody two divergent ideals of the Roman hero. Finally, this paper reinforces the argument proposed by scholars who suggest that Aeneas' victory over Turnus reveals Virgil's proposal of a replacement of the old heroes with a newly redefined Roman hero ready to reflect the values of a similarly redefined Roman Empire.

Vietnam and Aftermath

Palmer 208, 1:00pm – 2:00pm

Session Chair: Drew Wagstaff

1:00

“Validating Public Dissent: Senator Fulbright and the Vietnam Hearings”

Caroline Colpoys

Faculty Sponsor: Robert Saxe, Department of History

The struggle for power between Congress and the President regarding foreign affairs came to a head during the Vietnam War. On one hand, the Congress had given President Johnson power under the Gulf of Tonkin resolution to “take all necessary measures to repel any armed attack against the forces of the United States and to prevent further aggression”. However, as of 1966, with public support of the war waning and violence escalating, the United States Congress began to re-evaluate their “blank check” of aggression for Johnson. From January 28 to February 18 Senator J. William Fulbright and the U.S. Senate Committee on Foreign Relations orchestrated a series of hearings televised nationally that questioned the United States involvement in the Vietnam War. While the hearings did not alter President Johnson's strategy nor offer an applicable alternative, they educated the American public on Vietnam policy debate, increased the influence of public opinion, and through the leadership of Senator J. William Fulbright legitimized opposition to the war as reputable.

1:15

The Press at War: Media Coverage of the War in Vietnam

Ian Engdahl

Faculty Sponsor: Robert Saxe, Department of History

In the conventional wisdom that has emerged regarding the Vietnam War, the media are often portrayed as having played a pivotal role in channeling public opinion against the war, irreparably damaging the American military mission. This research analyzes the nature of media coverage of the Vietnam War, as well as the ethical and logistical constraints facing journalists covering the war. This research reveals a marked increase in critical media coverage of the war in 1968, yet an analysis of public opinion polling reveals that this shift in media coverage paralleled but did not provoke the change in public opinion of the war. This analysis reveals that the media coverage of the Vietnam War was a necessary—but not sufficient—cause of the U.S. withdrawal. That is, but for the groundbreaking and skeptical journalism of a few great reporters that revealed some of the war's greatest costs, support for the war would likely have been more sustainable. It was not, however, the media alone that lost the war.

1:30

Bombs at Home: Intersections of the Civil Rights Movement and the Vietnam War

Kimberly Harn

Faculty Sponsor: Robert Saxe, Department of History

My paper explores the nexus of race, domestic and foreign relations at the juncture of two of the most dynamic historical developments of mid-century America – the Vietnam War and the Civil Rights Movement. Analyzing the antiwar responses of an individual civil rights leader, Dr. Martin Luther King Jr., and a civil rights organization, SNCC (Student Non-Violent Coordinating Committee), in addition to other voices of dissent, it will be argued that civil rights movement provided a unique interpretive framework for the Vietnam conflict. Traditional narratives have often dismissed civil rights activists' opposition to the war as a product of radicalism. In these interpretations, opposing the war ultimately detracted from the cause of racial justice. My paper will argue, in contrast, that opposition to Vietnam grew directly from activists' organizing experiences; the linking of domestic and foreign issues arose organically from their activism. Thus, the landscape of the civil rights movement and the direct organizing experiences in this struggle for racial justice proved to be the most decisive factor shaping civil rights activists' opposition to the Vietnam War.

1:45

“There’s the way it ought to be, and there’s the way it is,” : Race Conflicts Explored and Perpetuated Through Vietnam War Films

John Pevy

Faculty Sponsor: Robert Saxe, Department of History

Following the end of the Vietnam War, the American people sought a variety of avenues to help explain the atrocities they had witnessed. One of the most highly lauded of these vehicles for explaining the war was through film. However, oftentimes these cinematic representations of the war fall short of fully elucidating the myriad of complexities present during the episode. Examining the attempts by filmmakers to confront racial tensions and identity within the American troops and comparing that with the portrayal of the Vietnamese within the films *Full Metal Jacket*, *Platoon*, *Good Morning Vietnam*, *The Deer Hunter*, *Apocalypse Now*, and *Hamburger Hill* illustrates how these Hollywood depictions of the Vietnam War are plagued by an American-centric lens, crippling them from fully comprehending the conflict.

Early American Literature

Palmer 207, 2:00pm – 2:45pm

Session Chair: Katy Johnson

2:00

"A Tribe of Ugly Phantoms": Edgar Huntly and the Search for American Identity among the Grotesque

Hunter Kuhlmann

Faculty Sponsor: Jason Richards, Department of English

In his 1799 novel *Edgar Huntly*, Charles Brockden Brown explores the seemingly antithetical relationship between two vastly different conceptions of American identity emerging in the Early National Period: the dominant Enlightenment narrative of a free, democratic society, and the competing characterization of America as a troubled land haunted by the specters of genocide, class division, and human irrationality. As the naively optimistic *Edgar Huntly* journeys deeper into the labyrinthine wilderness battling cougars and Native Americans, Brown creates character doublings that erase any clear line between “civilized” and “savage”, demonstrating the irreducible hybridity central to the American experience. Brown projects the fractured alienation he perceives within the psyche upon the landscape and texture of the novel itself, locating the American experience within the liminal realm of the grotesque. Ultimately Brown uses the paradoxical aspects of the grotesques inhabiting his gothic darkness to create a profound statement about the transcendent nature of both the new American literature and the American identity, an identity that absorbs both the positive and negative narratives surrounding its genesis and becomes something infinitely more complex, heterogeneous, and limitless.

2:15

Edgar Huntly and the American Literary Revolution

Andrew Millen

Faculty Sponsor: Jason Richards, Department of English

Arriving just a few years after the end of the American Revolution, Charles Brockden Brown’s *Edgar Huntly, Or, Memoirs of a Sleep-Walker* (1799) was dually important. Thematically dark, paranoid, and self-questioning, the novel is a grim reflection of a young country struggling to cope with its emerging postcolonial identity. More significant than its subject matter, however, is the novel’s impact on the discursive development of the American literary voice. Authors like Brown were responding to a cultural desire for uniquely American literature and the establishment of a national canon; *Edgar Huntly* answers this call by transposing the popular European genre of Gothic onto the American terrain. Like his country, Brown throws off the weight of European tradition and creates a new style of Gothic that utilizes features and experiences that are exclusively American, replacing Old World ghosts with savage Indians and ancient castles with vast, untamed wilderness, and taking a turn inward, exploring the dark mystery of the psyche. Brown’s novel and its psychological approach to exploring the American struggle would become both a landmark of American literature and a standard for the American Gothic.

2:30

Postcolonial Anxiety: Fearing Freedom in *Charlotte Temple* and *The Coquette*

Katja Zurcher

Faculty Sponsor: Jason Richards, Department of English

In the early American novel, personal conflict reflects both national conflict as well as the postcolonial anxieties of the emerging nation. The atmosphere of the new republic was fraught with concerns over the potential dangers of too much democratic freedom, and this anxiety is registered in two popular early American novels: Susanna Rowson’s *Charlotte Temple* (1791) and Hannah Webster Foster’s *The Coquette* (1797). Characterized by similar plots, rhetoric, and themes, the two novels are an outward expression of the nation’s restlessness over the freedom of its own people. Resisting the pressures placed on them by a patriarchal society, the novels’ heroines attempt to exert their own agency outside of their expected gender roles. However, when they stray from the strict social code, they are forced into isolation and left to die, which suggests that too much freedom is dangerous.

Art, Reconsidered

Palmer 208, 2:15pm – 3:15pm

Session Chair: EJ Juchheim

2:15

Visual Language and Understanding: The Problem with Non-Representational Art

Allen Pierce

Faculty Sponsor: Leigh Johnson, Department of Philosophy

In the last hundred years, patronage of the visual arts by the average man and woman has plummeted, and art has moved from the home, workplace and public forum into the museum and gallery and locked itself in. Meanwhile, philosophers of art have by and large focused on either the intention of the artist or the emotional reaction of the viewer, neglecting the entire system of communication that lies between them, buried in the artwork itself. For this reason I think it important that we reexamine art using the tools of semiotics in order to better understand the language of visual art and reevaluate the art world's current tack. I will apply the ordinary language principles developed for verbal language by Wittgenstein et. al. to the visual language by which the artist communicates with the viewer. In so doing I hope to illuminate the way in which many non-representational artists beginning with Duchamp have been producing work with little or no semiotic value and are, in a way, speaking a visual language intelligible only to themselves. Furthermore, I will discuss the role of the aesthetician and critic in at once perpetuating and insularizing these artists' work.

2:30



Music as a Reflection of Identity: The Effects of Reform Judaism on Southern Jewish Identity

Bailey Romano

Faculty Sponsor: Tracy Lemos, Department of Religious Studies

Despite vast knowledge pertaining to the relationship connecting instrumental liturgical music and Reform Judaism in the United States, scholars have not argued enough for the correlation linking Jewish liturgical music and the formation of Jewish identity in America. The formation and continuation of Jewish identity is in a perpetual state of redefinition. Although identity is constantly evolving, music can be used as a lens through which identity can be better understood. What is more, music plays a role in reinforcing and established identity. Because of this, music can be used as a lens revealing changes in identity over time. In particular, the music of Southern Reform Jewish congregations can provide a way of observing the difficulties of establishing and continuing a religious identity through the transition from Orthodoxy to Reform. Through an analysis of Temple Israel in Memphis, TN, and its transition from Orthodoxy to Reform, I demonstrate the ways in which liturgical music reflects the formation and continual reinterpretation of Jewish identity. The argument presented in my paper is significant because of its contribution to scholarly research on Jewish identity and its relationship to liturgical music and Reform Judaism.

2:45

The Presence of Dionysus in Early Christian Art

Victoria Adcock

Faculty Sponsor: Ariel Lopez, Search Program

In the Late Antique Period, circa 200 to 700 AD, the Roman Empire experienced significant changes, most importantly the legalization and imperial endorsement of Christianity, which eventually led to the Christianization of the Empire and the end of official paganism. Throughout this period, however, images of the pagan gods, particularly Dionysus, continue to appear on works of art, supposedly commissioned or created by these early Christians. The images of Dionysus are particularly puzzling, as many aspects of the god's "particularly the drunkenness and sexual excess" would have been frowned upon by the early Christians, who were encouraged to practice moderation and to refrain from sex. It is puzzling, therefore, that they would choose to have depictions of this god in their homes and public buildings, a question which this project aims to explain. This project explores the nature of the god himself and his cultic worship, examines the presence of pagan gods in general and Dionysus specifically in Christian art.

3:00

Colonial Representations, Post-Colonial Aspirations: French Cultural Policy during the Final Decade of the Tunisian Protectorate, 1946-1956

Daniel Williford

Faculty Sponsor: Jeffrey Jackson, Department of History

In the Tunisian Protectorate, the phrase “cultural activities” referred to events such as artistic expositions, academic conferences, and literary competitions organized by a variety of associations which received backing from the French colonial administration. By examining in detail these cultural activities, sponsored primarily by the Bureau of Public Instruction in the decade before independence, I will argue that through such events the government of the Resident General sought to propagate and promote a particular image of French culture among Tunisian elites with the intention of securing a dominant position for French art, language and literature in a post-colonial Tunisia. This image, which presented French culture as both unified and diverse, continuous and dynamic, universal and superior emerged principally as a response to the new political realities created by the growing strength of Tunisian nationalism. In addition, assuring this privileged position for French civilization in areas where direct political control was being curtailed or abandoned altogether was a process directly related to Frenchmen’s negotiation of their own cultural identity in relation the rest of the world during the post-WWII era.

Nationality and Gender Conflicts in Hispanic Literature

Palmer 205, 2:30pm – 3:30pm

Session Chair: Anne Harper

2:30

Los inmigrantes bolivianos en Argentina: Influencias culturales sobre la experiencia

Rachel Robinson

Faculty Sponsor: Eric Henager, Department of Modern Languages

Mi trabajo se va a enfocar en la inmigración des Bolivia a Argentina desde 1990. En particular, mi investigación explora la inmigración en Argentina en su contexto cultural, y los efectos en la experiencia argentina de los inmigrantes bolivianos. Primero, el trabajo introduce el tema de varios momentos importantes en la historia de la inmigración argentina. En este sentido, explora las influencias migratorias desde el tiempo colonial en Argentina y los productos culturales, como los de literatura como la mas famosa Civilizacion y Barbarie de D. F. Sarmiento. Finalmente mi trabajo analiza la yuxtaposición de estas referencias culturales y la comunidad de bolivianos en Argentina.

My paper will focus on immigration from Bolivia to to Argentina since 1990. In particular, the investigation will explore the cultural context of immigration to Argentina and its effects on the Argentine experience of the Bolivian immigrants. First, the paper introduces the theme of various important periods in the history Argentine immigration. In that sense, it explores the influences on immigration sine the colonial period of Argentine history and its cultural products. Then, it will create a juxtaposition of these cultural references and the Bolivian community in Argentina.

2:45

El papel del género en Primera Memoria por Ana Maria Matute

Kathryn Vernon

Faculty Sponsor: Eric Henager, Department of Modern Languages

Mi presentación refleja mi investigación sobre el papel del género en la novela Primera memoria por Ana Maria Matute. Primera memoria usa una narradora femenina, Matia, para contar la historia de la vida de una joven durante la Guerra Civil Española. La voz narrativa provee una perspectiva fresca y única contrastada con las imágenes de guerra, asociadas consistentemente en la novela con lo masculino. Los aspectos masculinos todavía aparecen en la novela, pero los recibimos por medio de la conciencia de una niña en vez de la de una figura masculina. La estrategia de contextualizar la guerra en la vida y mente de un personaje femenino causa que el lector cuestione las preconcepciones de género. Aunque el cuento tome lugar en una isla mediterránea y no en la Península donde se libra la mayor parte de las batalla, Matia todavía se encuentra rodeada por la hostilidad y por conflictos entre

partidarios opuestos. A pesar de su confusión e ingenuidad, Matia tiene que luchar para entender las relaciones que mantiene con individuos ambos presentes y ausentes. Mientras nos cuenta estos pasos de su vida, Matia empieza a entender la complejidad de la maduración, incluso la dificultad de ser leal, independiente, y confiable.

My URCAS presentation reflects my investigation into the role of gender in Ana Maria Matute's novel *Primera memoria*. This novel uses a female narrator, Matia, to tell the story of the life of a young girl during the Spanish Civil War. This provides a fresh and unique perspective by going against the expectations of a war novel, focused on masculinity. The masculine aspects still appear in the novel, however we receive them through the thoughts of a young girl instead of a male figure. Matute's decision to present the war through the life and mind of a feminine character causes the reader to question his or her preconceptions about gender and the capacities of both men and women. Even though the story takes place on an island off of Spain, Matia still finds herself surrounded by hostility and opposing parties. Under all this confusion and naïveté, Matia must fight to understand the relationships she holds with individuals both present and absent in her life on the island. While she leads us through the development of her life, Matia begins to understand the complexity of growing up, including the struggles with loyalty, independence, and trust.

3:00

Sender's Commentary on Spanish Culture through the Lens of Nancy

Kristin Wilkinson

Faculty Sponsor: Eric Henager, Department of Modern Languages

En la novela, *La Tesis de Nancy*, Ramón J. Sender escribe sobre una joven estadounidense, Nancy, quien va a Andalucía para estudiar durante un año. Por los ojos de Nancy, el lector recibe una crítica del país, la gente y sus costumbres. Ella conoce a mucha gente que influye su forma de pensar sobre la realidad española, aunque la mentalidad de Nancy va deformando esa realidad a cada paso. Mi estudio se enfoca en esa deformación de la realidad española por medio de la perspectiva de Nancy. Al mismo tiempo la novela desarrolla una crítica de la cultura académica de los EEUU. Con su personaje central, Sender elabora una reflexión no sólo sobre su patria sino sobre los contextos académicos estadounidenses en los que muchos exiliados españoles se encontraban en la época contemporánea a la publicación de la novela.

In the novel, *La Tesis de Nancy*, Ramón J. Sender writes about a young American, Nancy, who goes to Andalucía to study for a year. Through Nancy's eyes, the reader receives a critique of the country, the people, and the customs. She meets many people who influence her form of thinking about Spanish reality, even though Nancy's mentality distorts this reality at every turn. My study focuses in this distortion of the Spanish reality through Nancy's perspective. At the same time the novel develops a critique of the United States' academic culture. With his central character, Sender develops a reflection not only about his homeland but about the United States' academic contexts in which many Spanish exiles were during the contemporary epoch at the novel's publication.

3:15

The Use of Magical Realism in Europe in Strange Pilgrims

Katherine Williford

Faculty Sponsor: Eric Henager, Department of Modern Languages

En la colección de cuentos, *Doce cuentos peregrinos*, Gabriel García Márquez ubica a personajes latinoamericanos en contextos europeos. En varios de los cuentos emplea técnicas narrativas que manifiestan ciertas continuidades con su narrativa anterior. Otros elementos de los cuentos se pueden ver como rupturas con tendencias anteriores de García Márquez. En el presente estudio, analizo el uso de elementos como lo irreal que recuerdan la narrativa anterior y al mismo tiempo estudio técnicas que son novedades en la obra del escritor colombiano, como el empleo de niños protagonistas y de latinoamericanos exiliados. En particular la ponencia se enfoca en los factores del ambiente europeo que le son nocivos o fatales al latinoamericano. Para elaborar este análisis, me acudo con frecuencia a textos anteriores como *Cien años de soledad* y *Crónica de una muerte anunciada*.

In his collection of short stories, *Strange Pilgrims*, Gabriel Garcia Marquez puts Latin American characters in a European context. In many of these stories, he uses narrative techniques that are familiar to readers of Garcia Marquez. But other elements are new to his writing. In this essay, I analyze the use of elements like the unreal that are used in most of his works, and at the same time study techniques that are new to the Colombian writer, such as

the use of children as protagonists and latin americans in exile. In particular, I focus on the European environment as potentially detrimental to Latin Americans in exile. To elaborate on this analysis, I will also reference works such as 100 Years of Solitude and Chronicle of a Death Foretold.

Classical Literature

Palmer 207, 3:00pm – 3:45pm

Session Chair: Mary Honeychurch

3:00

On the God of Socrates: A Pagan Apology

Jill Crenshaw

Faculty Sponsor: Joseph Jansen, Department of Greek & Roman Studies

This paper argues that Apuleius' *On the God of Socrates*, a Platonic writing concerning the nature of demons, is often interpreted as a work of pagan apologia. While some scholars have entertained the notion that Apuleius was familiar with Christianity, I go much further, contending that *On the God of Socrates* responds directly to the arguments of second century Christian apologists, who sought to undermine pagan spirituality. In particular, the paper highlights the points of contact between Apuleius and the theological arguments of Justin Martyr by exploring Apuleius' other works and social relations. Apuleius' *On the God of Socrates* holds many similarities to the works of Justin Martyr and other apologists.

3:15

Augustus and Livy's Romulus

Sarah Rogers

Faculty Sponsor: Susan Satterfield, Department of Greek & Roman Studies

This thesis will explore Livy's version of the story of Romulus, especially with respect to Augustus. Romulus was the founder and first king of Rome and was highly admired by Augustus, who considered himself a second Romulus. Livy, a historian writing during the rule of Augustus, recorded our fullest extant version of the Romulus legend. I aim to show that through his Romulus story, Livy was presenting to Augustus praise for actions already taken and advice for his rule, as well as a warning for the future. Livy states that his history is meant to provide his readers exempla (examples) of how to live. Since one of his most important readers would have been Augustus, I argue that Livy used the Romulus legend to provide commentary on Augustus and his rule. Furthermore, Livy offers alternate versions of some stories which allow us to question the role of Augustus in Rome. Most of all, Livy offers a warning to Augustus and anyone with power not to make enemies, for if you do, the senators may tear you apart when a cloud descends.

3:30

The Objectivity of Celsus' De Medicina: An impartial outsider's unbiased treatment of biased sources

Jason Ballard

Faculty Sponsor: David Sick, Department of Greek & Roman Studies

The *De Medicina* by Cornelius Celsus remains the largest source of knowledge on the medical practice in the early Roman Empire. The medical field contemporary to Celsus was characterized by a heated debate concerning the proper roles of practical experience and philosophical theory in the training and practice of physicians. Conflicting beliefs divided authorities into three opposing schools of thought. As theories polarized, loyalty to a particular school strengthened, and members became reluctant to accept views that did not fit within their existing doctrine. Considering the biases and allegiances that shaped the beliefs of nearly all of his sources, one would expect to find throughout the *De Medicina* a consistently biased treatment of medical practice that would indicate an allegiance to the doctrine of a particular school. This study analyzes the primary tenets of each school's doctrine and the methodology proposed in the *De Medicina* to show that Celsus moves between the theories of all three schools with virtually no bias or signs of allegiance. In addition, modern opinion of what factors led to the division of theory and

references to Celsus by contemporary authors are examined to argue that his objectivity arose from his lack of professional medical training.

Critical Essays in the Humanities

Palmer 208, 3:30pm – 4:30pm

Session Chair: Bradley Arnold

3:30

Blood's Memory: Congenital Fatalism in William Faulkner's *Light in August*

Jeremy Culver

Faculty Sponsor: Marshall Boswell, Department of English

In *Light in August*, William Faulkner examines the rigidly defined societal identities of the post-war South through the metaphysical struggles of those who cannot fit neatly into its structure. The region's racial heritage constitutes the fundamental element of its internal division. Whites and blacks are split by a congenital division of status with priority and privilege entrenched firmly as the domain of the former race. Complications to this arrangement arise with the introductions of Joe Christmas, a man of uncertain blood who belongs to neither category, and Lena Grove, a young woman who seemingly defies the existence of any environmental pressure. Though their fates differ, the experiences of both reveal a fatalistic sentiment that underpins the novel. Internalizing this sentiment leads to self-destruction, while rejecting it causes isolation. Faulkner's South exists as a self-fulfilling paradox that conditions free will to choose predestined events. Societal progress can only be made through a conscious rejection of the precepts that maintain the paradox.

3:45

"To stand upon my kingdom once again": The Ethics of Fiscal Monarchy in *Richard II*

Andrew Miller

Faculty Sponsor: Scott Newstok, Department of English

Shakespeare's *Richard II* is a mirror for the landed magistrate. It is preoccupied with the connections between monarchs and their physical (and figurative) realm, thereby meditating upon the pull of a royal "land ethic." Richard's mystical invocations on the Welsh coast and Bolingbroke's pledge to reclaim his inherited "own" gesture towards a larger tension: between possessing the realm of England (in both the abstract and the concrete) and the ethical limitations and obligations of both would-be kings. Working off of Kantorowicz's seminal explication of the political theology of the king's "two bodies" while also drawing upon land and property law, this paper reads these anxious moments in terms of the "substance" of kingship. ("Substance," etymologically, in its under-standing basis.) The ethical crux of kingship lies in pitting the creaturely constraints of the body natural against the fiscal obligations of the body politic to the kingdom itself. In his self-deposition, Richard orders Bolingbroke to "seize the crown" – the moment is topological in function, topological in foundation, and ethical in ramification.

4:00

Challenging Goliath: Michael Collins' and Mohandas Gandhi's Resistance to British Imperialism

Mark Kelsey

Faculty Sponsor: Lynn Zastoupil, Department of History

Great Britain had amassed the most substantial Empire in history, but following the Great War, the Empire's authority was challenged by an internal enemy in rebellion against Imperial Rule. From 1916 to 1922, Mohandas Gandhi, a British educated barrister, and Michael Collins, a London clerk born in West Cork Ireland, confronted the entitlement of imperialism. Gandhi used a philosophical approach based in faith with the mission of true swaraj to take back the reins of India from the corrupting influences of modern civilization. Michael Collins reinvented Ireland's approach to rebellion by introducing a new type of warfare that would push England's resolve to its limits. Although Gandhi and Collins differed in perspective, method, and personality they demonstrated a devotion to the conviction of the idea of independence both in title and in identity for their respective homes and in doing so, created an atmosphere of uncertainty for the United Kingdom. Two men, through completely different methods, had

antagonized Britain's hubris of moral and cultural superiority. By pushing the English outside of the parameters that they were accustomed to, Gandhi and Collins effectively lit the fuse that would end imperialism.

4:15

The Construction of Female Ideologies in the Carthusian Order

Jen Kotrady

Faculty Sponsor: Bernadette McNary-Zak, Department of Religious Studies

The Carthusian Order is one of the most physically austere and contemplative monastic practices. The Order claims inspiration from the Desert Fathers and formulates its Statutes based on the laws established by the Church fathers. This inspiration suggests the Carthusian susceptibility to the female ideological construction, as presented by Elizabeth Clark in "Ideology, History, and the Construction of 'Woman' in Late Ancient Christianity." Clark notes that the Early Christian view of women comprises of the Church Fathers' sexist beliefs, and serves as a crucial methodology for understanding the misogynist aspects of the Carthusian Order. The connections between the Church and Desert Fathers' thought establish the sexism present in the origins of the Carthusian Order. Furthermore, it is imperative to understand how these ideological constructions affect the lives of the female Carthusians today, who live under stringent male supervision. The overarching issue concerns the female Carthusian's ability to uphold the utmost contemplative life, given the sexist foundations of the Order. The Carthusian Order is susceptible to forming female ideologies based on its insight from the Desert and Church Fathers, the overarching demeaning view of women in Catholicism, and how the nuns of today live in comparison with the brothers and fathers.

Hispanic Literature Under Dictatorships

Palmer 205, 3:45pm – 4:45pm

Session Chair: Morgan Smathers

3:45

Reality and Fiction in Liliana Heker's *El fin de la historia*

Katie Barham

Faculty Sponsor: Eric Henager, Department of Modern Languages

En los años después de la inestabilidad política en Sudamérica durante las décadas 1960, 1970 y 1980, los desaparecidos, presos políticos y las familias de personas asesinadas aún están buscando la justicia y la verdad. Diariamente salen informes sobre lo que realmente ocurrió en este tiempo de horror. Ha habido una cantidad impresionante de literatura sobre la época, tratando de aclarar la verdad oscura. Las mismas víctimas escriben una gran cantidad de esta literatura testimonial. Sin embargo, en *El fin de la historia* de Liliana Heker, los lectores se enfrentan con un problema: ¿Qué ocurre cuando la persona que escribe sobre la experiencia de ser preso político *no* fue un preso político? En esta ponencia exploro los métodos utilizados en la novela para crear una experiencia ficticia para reemplazar una experiencia verdadera. En la ponencia considero la técnica de yuxtaponer elementos de ficción con referencias históricas y lo que aquella estrategia permite en términos de representación de una época específica.

In the years following the South American political unrest of the 1960s, 1970s, and 1980s, the disappeared persons, political prisoners, and families of those murdered are still looking for truth and justice. Every day, new information is being revealed about what really happened during this horrific period. There have been a number of texts about the era, put forth in an effort to make its still cloudy truth more transparent. The victims themselves have written a great amount of this testimonial literature. However, in Liliana Heker's *El fin de la historia*, readers are faced with a problematic question: What happens when the person writing about the experience of being a political prisoner was never a political prisoner? I will attempt to explore the methods in the work used to create a fictional experience that replaces a realistic but less symbolic one. Further, I will consider how the work mixes truth and fiction, and how an understanding of the conflict between these two could aid in a more complete understanding of the period.

4:00

El dictador demonio contra el femenino: ¿Quién es el ganador para Mario Vargas Llosa?

Anna Luisa Johnson

Faculty Sponsor: Eric Henager, Department of Modern Languages

Para mí y para Mario Vargas Llosa, las tentaciones de Trujillo, el dictador ideal, son casi irresistibles. En *La fiesta del chivo*, Vargas Llosa, representante del Boom en la literatura latinoamericana, ha adaptado su estilo al realismo ficticio. Con hechos reales tomados del dictador Trujillo mezclados con personajes ficticios como la protagonista contradictoria, Vargas Llosa crea un ambiente que demuestra bien el demonio que dominó la República Dominicana por más de treinta años. Con un par de innovaciones narrativas y algunos elementos cuasi-fantásticos, Vargas Llosa delinea múltiples niveles de la maldad para pintar la figura del dictador capaz de violar a una niña inocente como a la sociedad dominicana en general. Con la bestia masculina que Vargas Llosa describe de una manera vívida, el autor ilustra la maldad de nuestra sociedad que produjo el chivo Trujillo. Lo que mantiene el tema oscuro de la maldad de nuestra sociedad son la retórica y el estilo único del autor. En mi ponencia, trazo las estrategias que Vargas Llosa emplea para elaborar su tema del demonio y para desarrollar la protagonista, Urania, como una especie de “hombre honorario”, y para concluir, cómo Vargas Llosa presenta una esperanza melancólica en la lucha contra la maldad.

For me and Mario Vargas Llosa, the temptations of Trujillo, the ideal dictator, are almost irresistible. In *The Feast of the Goat*, Vargas Llosa, representative of the Boom in Latin American literature, has adapted his style to realistic fiction. With real events taken from the dictator Trujillo mixed with fictional characters such as the contradictory protagonist, Vargas Llosa creates an environment that effectively demonstrates the demon who ruled the Dominican Republic for over thirty years. With a pair of narrative innovations and quasi-fantastical elements, Vargas Llosa delineates multiple levels of evil to paint the dictator capable of raping an innocent girl as well the Dominican society in general. With the male beast Vargas Llosa describes in a vivid manner, the author illustrates the evil of our society that produced the goat Trujillo. What maintains this dark theme concerning evil in our society are the rhetoric and style of the author. In my paper, I analyze Vargas Llosa's strategies used to develop his theme of the devil and to develop the protagonist, Urania, as a type of "honorary man", and finally, how Vargas Llosa presents a melancholy form of hope in the fight against evil.

4:15

The Modern-Day Quijote and Imagination and the Hero

Stephanie Mingos

Faculty Sponsor: Eric Henager, Department of Modern Languages

Podría decirse que la figura más reconocible en la historia de la literatura española es Don Quijote. Reconocido por la preservación del honor y los valores aprendidos de sus libros queridos, Don Quijote ha servido como modelo literario para incontables personajes de intenciones heroicas. En *Soldados de Salamina*, Javier Cercas inicia una búsqueda para descubrir un héroe real, presente en el momento del asesinato fracasado de Sánchez Mazas durante la Guerra Civil Española. Durante su investigación, Cercas (o el personaje del mismo nombre) se desvía de su propósito de escribir un “relato real” y en el proceso, toma libertades creativas para continuar su proyecto de encontrar al héroe, un paso que pone en peligro la veracidad de su aventura. Su falta de inhibición al moverse entre la historia y la ficción y su inversión personal en su búsqueda crean un subtexto importante sobre la construcción del héroe y las motivaciones del escritor. Utilizando aspectos quijotescos y otras cualidades de héroes literarios, mi ponencia se centra en los componentes heroicos representados en *Soldados de Salamina*. Se indaga en cuestiones de imaginación y percepción que Cercas desarrolla como componentes esenciales de nociones españolas del héroe. La ponencia examina en particular los momentos de la novela que problematizan los vínculos entre héroes literarios y héroes históricos. Tomando en cuenta el peso que tiene la figura de Don Quijote en la cultura española, leo la novela de Cercas en parte como un comentario sobre el proceso por medio del cual el héroe literario puede deformar al héroe de verdad.

It can be said that Don Quijote is the most recognizable figure in the history of Spanish literature. Recognized for the preservation of honor and values learned in his beloved books, Don Quijote has served as a literary model for innumerable characters with heroic intentions. In *Soldados de Salamina*, Javier Cercas initiates a search to discover the real hero, present at of the failed assassination of Sanchez Mazas during the Spanish Civil War. During his investigation, Cercas (or the character bearing his name) deviates from his purpose of writing a “real account” and in

the process, he takes creative liberties in order to continue his project to find the hero, a step that endangers the legitimacy of his adventure. His lack of inhibition to move between fiction and history and his personal investment in the search create an important subtext about the construction of the hero and the motivations of the author. Utilizing quijotesque aspects and other heroic qualities in literature, my proposal is centered on the heroic components represented in *Soldados de Salamina*. It investigates the imagination and perception that Cercas develops as essential components of Hispanic notions of the hero. The project examines in particular moments in the novel that problematize the ties between literary and historic heroes. Taking into account the weight that a figure like Don Quijote possesses in Hispanic culture, I read Cercas' novel in part to develop a commentary about the process through which a literary hero can distort a real hero.

4:30

Existentialism and personal identity: the function of political dictatorship in Alberto Fuguet's *Mala Onda*

William Polan

Faculty Sponsor: Eric Henager, Department of Modern Languages

Set to the backdrop of civil unrest during the Pinochet dictatorship, *Mala Onda* by Alberto Fuguet draws unique perspective to the conflict through protagonist Matias Vicuna. A high school student of upper-class origins, Matias, struggles to stay afloat amid personal, political, and family crises. In a coming of age novel, political instability and the Pinochet dictatorship weigh heavily on both the protagonist and the reader. Matias fights with existentialism as he searches for his identity and the meaning behind the struggles he endures. Utilizing first person narrative, themes of alienation, guilt and angst form a unique existential perspective. Through Fuguet's portrayal of both Matias Vicuna and the Pinochet dictatorship, arises an existential crisis of existence.

The Search for Values in Light of Western History and Religion

Palmer 207, 4:00pm – 4:45pm

Session Chair: Evan Nelsen

4:00

Shakespeare and Machiavelli: Power vs. Virtue

Maha Bano

Faculty Sponsor: Judith Haas, Department of English

4:15

Rousseau vs. Hobbes

Maria Raffanti

Faculty Sponsor: Daniel Cullen, Department of Political Science

4:30

Five Steps to Happiness: Self-Help from the History of Western Thought

Ian Engdahl

Faculty Sponsor: David Sick, Department of Greek & Roman Studies

SOCIAL SCIENCES ORAL SESSIONS

Research in Economics

Kennedy 205, 1:00pm – 2:30pm

Session Chair: Catherine Appleton

1:00

Modeling Career Salaries in Major League Baseball

Joel Berger

Faculty Sponsor: Nick McKinney, Department of Economics & Business

Using data collected from the Lahman Baseball Database, this study found that college attendance does not affect the total career salary of either batters or pitchers, the total salary earned in the first six years, or the arbitrations years, of batters and pitchers, and for the first half of both batters' and pitchers' careers. However, college attendance does prove significant and beneficial for pitchers in the second half of their careers. Results found that being an international player does prove beneficial, more total salary, for batters across their entire career and for both batters and pitchers during their arbitration years. The rookie age of a both batters and pitchers is only significant leading to a higher total salary during the arbitration years. The study builds models to map total salary for batters and pitchers using performance statistics.

1:15

The Change in Recycling Rates

Anne Buckthal

Faculty Sponsor: Nick McKinney, Department of Economics & Business

I am examining the change recycling rates in Massachusetts from 2003 to 2008 and the factors that affect the amount of recycled materials. The variables in my model include the tons of garbage disposed per year, the population of the city, the median household income by city, the percent of the population with a bachelor's degree by county, the type of recycling program, and whether or not the city has a Pay as You Throw (PAYT) trash collection system. The results show, contrary to previous research, that the type of recycling program, either curbside or drop-off, does not have a significant effect on the recycling rate, but a PAYT program has a positive and significant impact on the recycling rate. Also contrary to previous research, the level of education does not have a significant effect on the rate. Both the year and the median household income increase the recycling rate. My research shows that PAYT is now a significant factor in recycling rates, the amount of materials recycled increases per year and that education no longer plays an important role in recycling.

1:30

HOPE VI Relocation Efforts and Housing Prices

Jami King

Faculty Sponsor: Nick McKinney, Department of Economics & Business

The Housing for People Everywhere (HOPE) VI program provided multiple grants to the city of Memphis to revitalize dilapidated public housing projects and transform them into mixed-income communities. The result was the relocation of a large number of public housing residents. This study researches the effects on housing prices in Shelby County of the relocation of residents from Memphis public housing projects into Section 8 properties through the HOPE VI project. The Shelby County Assessor's Office collects data on house sales and specific characteristics of properties. Using Shelby County Assessor data, I constructed zip code analysis of county housing prices from 1980 to 2008, relying on hedonic pricing method variables, and time function variables to account for fluctuations in neighborhood prices. This study finds that the relocation of HOPE VI residents is inversely related to the housing prices within zip codes in Shelby County.

1:45

The Impact of Industries on Senate Voting

Kelley Ranager

Faculty Sponsor: Nick McKinney, Department of Economics & Business

In a representative democracy politicians are responsible for making decisions that will benefit their home states. Many papers try to identify factors, both political and economic, that play a role in the voting decisions of the senators. In this paper I will use data from each state's economy and senate votes to look at whether or not the structure of the market in each individual state affects the votes in the senate. With a probit model, I hope to estimate how each industry effects the likelihood that a senator will vote for or against a certain bill or amendment. Using percentages of real GDP, I will look how much each sector of industry attributes to a state's economy as a whole. With each individual vote, I look at sectors of the industry directly related to the subject matter of the vote, and model each vote based on those industries.

2:00

The Consolidation Question: How School District Factors Affect Students

Sarah Rogers

Faculty Sponsor: Marshall Gramm, Department of Economics & Business

The upcoming consolidation of Memphis City Schools and Shelby County Schools has been widely debated. The consolidation will greatly increase both the size and diversity of the Shelby County School District. This study aims to look at the possible effects of the merger. By using data from the 100 largest school systems in the United States, this paper examines the effect of the number of students in a school system, among other variables, on the system's average freshman graduation rate. The study also looks at the elimination of choice which occurs in a school consolidation by regressing the number of public and private school options near the school system on the graduation rate. The number of students in a system seems to have a slight negative effect on graduation rate, and the number of options in an area, which create competition, has a positive effect on graduation rate.

2:15

The Effect of Cremation on the Monument Industry

Jay Travis

Faculty Sponsor: Nick McKinney, Department of Economics & Business

Cremation rates have steadily been on the rise in the United States. Due to the increase in cremation I wanted to find out what are some of the variables involved influencing people to decide whether or not to be cremated. Having ownership of a small monument company back home, this topic and results can be very important and looked upon to help construct future plans and ideas for our business. The problem I am trying to solve is the effect of cremation rates on the monument industry. I will be using variables such as race, religion, federal regulations, and location to determine each of the variables effect on cremation. This will be my main regression, but I also look to take this regression and use it with some of our company's sales over the past decade and to see the correlation. After preliminary results, I found that religion plays a key role in the decision to be cremated. Federal regulations also play a role in a state's overall cremation rate. In conclusion, with the results from my regressions and case study with our own monument company, I hope to be able to prepare for the future of our company when and if cremation rates hurt our business.

Research in the Social Sciences
Kennedy 208, 1:00pm – 1:45pm
Session Chair: Joshua Anderson

1:00

Teaching and Learning Through the Arts: The Influence of the Arts in Non-Arts Classrooms

Charles Tyler Turner

Faculty Sponsor: Mark Smith, Department of Education

Rigorous disciplinary and academic standards are melded with a rich musical curriculum at the Soulsville Charter School in Memphis, TN. Sponsored in part by the Stax Museum of American Soul Music, all students in the school play an instrument and rehearse with an orchestra daily. This qualitative research study goes beyond the overt musical influences in the school and examines the role of the arts and creativity in non-arts classrooms (such as math and science). Following the qualitative research model, I entered the study with no hypothesis, but rather a question that I sought to answer through the observation of a specific educational setting. Thus, my research consisted of looking for examples of music, visual art, dance/movement, or theatrics in the sixth grade classrooms at Soulsville. My writing chronicles these observations and draws both specific and general conclusions about the impact of the arts. I make specific conclusions concerning affects on student behavior, academic performance, and motivation to learn at Soulsville. Understanding that qualitative research cannot be conclusively and broadly generalized, I also offer informed assertions about the influence the arts play in all classrooms.

1:15

Can Elvis Hinder Retrieval of Elton? How Phonological Priming and Semantic Competition Affect Proper Name Retrieval

Elizabeth A. Frame, Gregory M. Palm, Rachel Stowe

Faculty Sponsor: Katherine White, Department of Psychology

A tip-of-the-tongue (TOT) state occurs when a well-known word temporarily escapes retrieval, disrupting otherwise effortless speech production. The present research experimentally investigated the inability to retrieve a target name (e.g., Joe Montana) because an alternate name that is similar in sound and meaning (e.g., Joe Namath) comes to mind instead. Participants were presented with questions asking them to retrieve famous proper names from various semantic categories (e.g., actors, athletes, politicians). Upon indicating a TOT, participants were asked a question that included a different famous name (i.e., prime) that was either semantically related or unrelated to the target. In addition, primes shared first name with the target (e.g., Joe), shared first syllable with the target (e.g., Elvis for Elton), or did not share phonology with the target. Retrieval of target names was re-attempted. Results indicated that first-name primes in either the same or different semantic category facilitated TOT resolution, relative to an unrelated name. However, first-syllable primes facilitated TOT resolution when in a different semantic category and inhibited TOT resolution when in the same semantic category. These results demonstrate that semantic overlap induces competition only when there is incomplete phonological input, allowing an alternative name to prevent TOT resolution from occurring.

1:30

Interpretive Competence: Hermeneutical Lessons from Antoine de Saint-Exupéry and Thomas Merton

Colin McDonald, Charles Yarn

Faculty Sponsor: Thomas McGowan, Department of Anthropology & Sociology

Hermeneutics is the study of interpretation—the study of how humans interpret meaning based on their cultural foregrounding. This paper begins by conceptualizing interpretive competence in terms of Hans-Georg Gadamer's three-part typology of interpretive interaction. The defining features and requirements of interpretive competence are then explored in relation to Thomas Merton's work on the nature of violence and peacemaking. The central character of Antoine de Saint-Exupéry's *The Little Prince* is then presented as a paradigmatic case of interpretive competence. Finally, the practical relevance of interpretive competence is explored in reference to our experience as liberal arts college students at Rhodes College.

Ethnography at Home

Kennedy 201, 1:00pm – 6:00pm

Session Chair: Susan Kus

1:00

Scratching the Surface: An Ethnographic Study of a Memphis Vietnamese Nail Salon

TonAi Doan

Faculty Sponsor: Susan Kus, Department of Anthropology & Sociology

There has been a growing trend in recent years of Vietnamese Americans and other immigrants working within the nail industry. Working as a nail technician is not a glamorous job. It appears to many outside the industry to be a simple and straight forward job. It is a job that requires not only speed and precisions, but also patience and humility. Technicians sacrifice their personal space to work with people's hands and feet. Besides discussing the challenges nail technicians face on the job, this presentation also explores the complexities of conducting ethnographic research, specifically focusing on my experience as a Vietnamese American studying other Vietnamese Americans. While familiarity with language and culture gave me some advantages, it also presented a number of challenges. By becoming a participant observer in a nail salon this semester, I have come to understand the complexities and intricacies of a nail technician's job.

1:15

The Animals Behind the Animals: A Behind the Scenes Ethnography of the Memphis Zoo

Alex Lippincott

Faculty Sponsor: Susan Kus, Department of Anthropology & Sociology

The practice of ethnography serves to gather information about the vast cultural variety displayed by our species. This ethnographic study attempts to understand and explain the shared culture of those that work to maintain the Memphis Zoo and is based on the field work that I carried out on location over the course of this semester. In an attempt to highlight the "animals behind the animals," this ethnography exhibits those who work to maintain the exhibits and display those who create the displays. In particular, I discuss the intricacies and demands of tasks and schedules that govern the life of zoo employees. I seek to explain not only how one "keeps" a zoo, but also why.

1:30

Impediments to Speech: Learning English as a Second Language

Ashley Jones

Faculty Sponsor: Susan Kus, Department of Anthropology & Sociology

Ethnography is the heart of cultural anthropology, and participant-observation is the key to the ethnographic method. Participant-observation involves examining and interacting with those within a particular cultural scene. This semester I chose to observe an English as a Second Language class at Literacy Mid-South by situating myself as a student. My study raised several questions. How do stereotypes of non-native speakers compare to the realities of those actually learning English as a second language? What does a student hope to gain from his or her mastery of the language? Do accents matter? In researching these questions, I learned there is a language prejudice that plagues our society, and that grammar and vocabulary are not always the biggest challenges to learning English. I discovered that it takes more than just determination and dollars to learn and improve one's English in this society.

1:45

Animals Speak: An Ethnographic Study of a Memphis Animal Clinic

Jeanine Claiborne

Faculty Sponsor: Susan Kus, Department of Anthropology & Sociology

The ethnographic method is a way for researchers to enter an unfamiliar field or culture with the purpose of learning about it, discovering something that is unknown to them. One of the best ways to accomplish this is through participant observation, where the researcher not only watches what goes on but also gets involved in it as well. I used the ethnographic method as a way to acquire knowledge and understanding about the culture of an animal clinic here in Memphis in order to gain an appreciation for this culture. Not many people are aware of what goes on

inside of an animal clinic. Through my role as a volunteer, I was able to engage and participate in their culture and their way of life, and I began to become aware of some themes and patterns. One was the strength of communication that flowed between humans and animals. We know that animals cannot speak; however, it amazed me to see how strongly some pet owners spoke up and advocated the issues and conditions that complicated the life of their beloved pet. This communication also extends to the response of the doctor and staff when it came to treating these animals. My presentation attempts to help us appreciate the hows and whys of the “Dr. Dolittle” in pet owners and veterinarians.

2:00

Hanging out at the Edge: An Ethnographic Look at the Community Built Within a Local Coffee Shop

Jack Clark

Faculty Sponsor: Susan Kus, Department of Anthropology & Sociology

Ethnography is an anthropological method that can be used to gain an inside view of a cultural scene. This method involves actively participating within a location to eventually become familiar with the setting. It also involves observing and recording details that range from the interactions with people who frequent the site, down to the sensory elements including how the location smells, looks, and even how the atmosphere feels. For the past semester I have been practicing the method of ethnography at “The Edge Coffee House” in Midtown-Memphis, Tennessee. My presentation will discuss how through my experience I have realized that this establishment is more than a place to drink coffee; it is rather a home for community and a safe haven for many. I will also discuss how I have come to learn that elements of the practice of ethnography can be extended into my daily life: placing an emphasis on being aware of my surroundings and appreciating the positive benefits of asking, listening, feeling, and learning another way of life.

2:15

Saved by the Bell: A Look at the People Behind the Music

Carolyn Drobak

Faculty Sponsor: Susan Kus, Department of Anthropology & Sociology

The ethnographic method is an important method in anthropology that allows a researcher to become a part of the culture so that he/she can both understand and appreciate the culture more fully. The ethnographic method of participant observation allows the researcher to be both an active participant of the culture they study as well as an observer of the culture. I was fortunate enough to have the opportunity to use the ethnographic method at Evergreen Presbyterian Church in the Jubilate Handbell Choir. I joined the choir this semester as a novice handbell player. While initially I thought that the people in Jubilate would conform to a conventional profile, through my research I came to realize that there is not one standard description for a handbell player. The people in Jubilate come from all types of backgrounds and as a group are interested in a myriad of different things; the members are of many different age groups and are at different places in their lives. My study attempts to understand how despite diversity, the members of the choir meet the challenge of working harmoniously as one interdependent group striving for the same goal: “heavenly music.”

2:30

Stretching Perceptions: An Ethnographic Study of Give Yoga Memphis

Anne Farrar

Faculty Sponsor: Susan Kus, Department of Anthropology & Sociology

The ethnographic method is a critical methodology of anthropological studies. The use of participant observation allows the ethnographer to be immersed in the culture, and to focus on all the details, patterns, and social relationships of a culture. This semester, I chose to study Give Yoga Memphis in order to better understand the ethnographic method, as well as the Give Yoga lifestyle. I attended two to three classes per week. One class I attended regularly, but for the other classes, I tried to pick different instructors and practices. I wanted to see as many aspects of yoga as possible. After several classes of seeking to figure out positions and gritting my teeth through the more painful ones, I began to find a balance. Balance is key to mastering the positions and holds of yoga, as many people know. However, I learned that the yogi’s balance extends beyond the physical realm. My

study explores how the studio aims to teach individuals how to “live on a higher frequency,” that stretches beyond the body to encompass mind, relationship, and lifestyle, as well.

2:45

Conversation Never Stops, We’re Cuttin’ Up At The Barbershop: An Ethnographic Account of An African American Barbershop

Jordan Gilmore

Faculty Sponsor: Susan Kus, Department of Anthropology & Sociology

Many individuals in today’s society take great pride in their hair. When the time comes for individuals to have their hair professionally cut, styled, or even washed, they make their way to locations that cater to these desires. For some people, this location is the Barbershop. My ethnography, the act of observing a cultural scene and relaying information about the scene in a way that makes it familiar and understandable to those unfamiliar with it, was done on an African American barbershop here in Memphis. The purpose of my ethnography was to observe, and participate in, the cultural activity of the Barbershop to show that the culture within is so much more than what society constructs the institution of a Barbershop to be – simply a place to get a haircut. Through my ethnographic study, I expose the complex cultural scene of one African American Barbershop as a place of openness, which fosters social interaction and the comfortable exchange of opinions and beliefs. As a community space where a plethora of different people’s perspectives come into contact, the African American Barbershop is a cultural scene that is constantly adapting to and accepting of all types of individuals.

3:00

A Sprinkle of Culture: An Ethnographic Study of Muddy’s Bake Shop

Kara Holifield

Faculty Sponsor: Susan Kus, Department of Anthropology & Sociology

A social science researcher’s choice of methodology depends on her/his problem focus. In Anthropology, the ethnographic method involves participant observation in order to understand and describe alternative cultures. This semester, I observed a shop that is part of a growing trend of cupcake bakeries, Muddy’s Bake Shop. By interviewing and observing, I sought to understand why cupcake bakeries are a growing trend among times of increasing stress and chaos due to the recession. Also, I observed that people visit Muddy’s, instead of a corporate bakery down the street, because it makes good cupcakes at a low price and exudes a homey feeling. By posting personal pictures of friends, family, and customers, hanging homemade decorations, and selling clothing and treats bought from local entrepreneurs, going to Muddy’s is a unique and happy experience for most people entering the store. Observing at Muddy’s has convinced me that local businesses have something that corporate businesses do not: personality. This characteristic may explain why local businesses have survived corporate businesses expanding in all areas.

3:15

Puppy Parade! An Ethnographic Study of Avery Dog Park in Memphis, TN

Omar Khattak

Faculty Sponsor: Susan Kus, Department of Anthropology & Sociology

The ethnographic method is a powerful tool in attempting to understand a cultural scene that one is unfamiliar with. Engaging in participant observation, I have immersed myself in the field by becoming a member of the society of dog owners who regularly exercise their pets at Avery Dog Park in Memphis. In my time at Avery, I have observed many things: the professions of the canine-keepers who frequent Avery, the lengths to which people make sacrifices to afford their pets exercise, and the people’s willingness to take in stray dogs, to name a few. Perhaps most significant and least expected is the extent that people themselves have become domesticated by their own pets. These themes will serve as the central focus of my presentation.

3:30 – 3:45 Break

3:45

Goner Records and the Day the Music Died: An Ethnographic Study of a Midtown Record Store

Sarah Lavatai

Faculty Sponsor: Susan Kus, Department of Anthropology & Sociology

If the music industry has sold their integrity for the big bucks, then Goner Records in the Cooper-Young district of Memphis is an outsider among a crowd that prioritizes the money over the music. An outsider to the record store culture, I immersed myself in the store and practiced the ethnographic method of participant observation for eleven weeks. Ethnographic fieldwork is the respected methodology mainstay that involves entering a field site where one observes the behavior and rituals of the people. By obtaining a grasp of the cultural context, the ways of a different people become less foreign in the eyes of the ethnographer. The study of ethnographers can challenge stereotypes, dissolve ethnocentrism, and shrink the gap of understanding between cultures. My work in the field site of Goner Records has challenged my preconceptions of the ‘type’ of people that work at a record store. My findings suggest that the owners and employees at Goner Records prioritize recording and providing music over the bottom line. The culture of the store is structured around music instead of placating customers and business partners. My presentation will focus on how Goner Records survives selling music without “selling out”.

4:00

Storytelling: Old and New

C. J. Lewis

Faculty Sponsor: Susan Kus, Department of Anthropology & Sociology

What makes a story compelling? Is it the characters, the setting or the one telling the story? Humans have told stories for hundreds of years. It has been a way to talk about life, make sense of the world and brag about the last fish caught. In this study I chose to go behind the scenes of a new take on story-telling: Role-playing games. The way that I looked into this was the ethnographic method. This means that over the last 3 months I have gone to a store called Gamerz Depot to observe and participate in Role-playing games. Many times players are branded as geeks, nerds, even Satanists. However, within their imagined world they are masterful magicians, daring dragon slayers and splendid saviors. As this creative process unfolds we catch a glimpse of a powerful human endeavor: collective storytelling. While the Dungeon Master creates the story the story never finishes exactly as planned. This is because the story depends upon the players, and the players depend upon the story. If you want to see how this relationship plays out, if you dare, come to Buckman and witness the power of collective story telling.

4:15

A Slice of Life at Broadway Pizza: An Ethnography of a Family-Run Neighborhood Restaurant

Travis Lux

Faculty Sponsor: Susan Kus, Department of Anthropology & Sociology

Understanding “the other” is perhaps more important now, in our seemingly shrinking world, than it has been before. In the discipline of anthropology, we come to understand “the other” through the practice of the ethnographic method. This methodology is characterized by participant observation and allows the researcher to identify social patterns and cultural nuances through consistent engagement with a particular culture. I spent three months observing and participating in the cultural scene at Broadway Pizza in the Memphis neighborhood of Binghampton. My research questions ultimately focus on what it means to be a family-run business, for both the employees and the neighborhood at large, and how the restaurant remains successful and popular despite a poor economy, competition from standardized chain restaurants, and its geographically isolated location.

4:30

Village Coffee

Joshua K. McKinley-Smith

Faculty Sponsor: Susan Kus, Department of Anthropology & Sociology

Anthropologists use their ethnographic skills to bridge the cultural gaps that confound communication between differing groups of people. The ethnographic method of participant observation employs the anthropologist as an

active participant of a culture, or cultural scene in order to offer a more nuanced and complete picture of lives other than the ones we normally lead. What results is the dissolution of any barriers and miscommunications between differing groups of people, fostering a valuable progressive comprehensive cooperation for the benefit of all parties involved. And in an ever growing and connected world ethnographic endeavors such as these, as well as the anthropological mind, have never been more vital to the peaceful interactions and meaningful exchanges that take place between the diverse human communities of the world. The Binghamton community, right here in Memphis TN is a great example of a small-scale community that has successfully integrated its diverse neighborhood population. I took the role as ethnographer at its vibrant core community center and coffee shop, Caritas Village, to witness firsthand the process of community solidarity. What I found was a strong and beautiful matrix of social interaction, bound together by art and food. The shared communal space and the activities that take place in it are critical to maintaining community in this diverse neighborhood.

4:45

Turning the Tables: A Cultural Study of Life at the Soup Kitchen

Liza Newell

Faculty Sponsor: Susan Kus, Department of Anthropology & Sociology

The ethnographic method of participant observation has become increasingly important to modern-day society by contributing to our understanding of different cultures and values. During my time at Souper Contact, a soup kitchen run by Rhodes students and community volunteers, I worked as an active participant by involving myself in the cultural scene. I prepared meals, talked with the guests, and cleaned up when dinner was over. As my study progressed, I became aware of two subcultural groups within the overarching culture of the soup kitchen; the volunteers and the guests who came to eat, and I quickly found myself caught between the two. I struggled to integrate myself with the guests of Souper Contact. With time, however, I became familiar with the rhythm of the soup kitchen and the people who came there. I was able to form strong relationships with unique members of the Memphis community. My time spent as participant-observer at Souper Contact has provided me with data to dispel naive and negative stereotypes associated with guests of the soup kitchen. It has also provided me insight into the ways in which Souper Contact provides a community for those who might otherwise be without one.

5:00

Spinning Around the Digital Age: A study of Goner Records

Robin O'Neil

Faculty Sponsor: Susan Kus, Department of Anthropology & Sociology

Situated in the heart of the Cooper-Young district in Memphis, TN is a relatively inconspicuous record store Goner Records. You must be asking yourself: who listens to records anymore? This is just the question I looked to address when I began my ethnographic research at Goner Records. Utilizing the ethnographic method of participant observation has enriched my experience at Goner Records. The ethnographic method allows one to discover a cultural scene and interrogate its many dimensions and functions. As my time at Goner Records passed, I began noticing the obvious tension between the current digital age, and the retro analog age (vinyl record players). Questions of use and practicality arose, along with questions about the type of people this cultural scene attracts. In my time participating and helping out with activities around the shop I confronted many of the unique and sometimes frustrating features of dealing with a business counteractive to the popular mode of music listening. The presentation seeks to open the door to this shop and the comings and goings of ages.

5:15

Man Cannot Survive on Art Alone: The Importance of Business to Species-Being

Rachel Quisenberry

Faculty Sponsor: Susan Kus, Department of Anthropology & Sociology

The goal of ethnography is to understand the rich, complex meanings of another culture by immersing oneself in that cultural context. By articulating this experience, one can then pass on this new understanding to one's readers and listeners. The goal for the course, Ethnography at Home, was to practice using the ethnographic method of participant observation. I conducted my ethnographic study at Real 2 Reel Photography, a portrait studio in the South Main Historic Arts District. The owner/photographer has a clear passion for photography and people, as can be seen in the personalized art that he produces. Nevertheless his business has undergone drastic changes in the short

time I have been there, and while his enthusiasm has motivated him to work through these setbacks, it was his business sense that has kept Real 2 Reel on its feet. Working in his studio has taught me that the fulfilling and transformative work to which Marx referred in his concept of “species-being,” at least in our current society, requires more than simply passion and effort. I explore the assertion that in order to achieve one’s species-being today, one must often make a profit.

5:30

Curl up and Dye: The Art of Cosmetology at a Memphis Hair Salon

Ana Volarich

Faculty Sponsor: Susan Kus, Department of Anthropology & Sociology

The purpose of my research is to examine the ways in which group identity and interpersonal relationships intersect to constitute the cultural scene of a hair salon. Using the ethnographic method of participant observation, I studied the daily activities of stylists at a Paggio’s for Hair. Observation of stylists working with clients, and conversation with stylists and with clients provided me with an intimate look at the inner workings of the salon as a cultural setting. Personal statements gathered through interviews and casual conversation show how relationships and interactions between stylists function as the vital foundation of the salon. These accounts also provide the basis for understanding how Paggio’s stylists interpret the art from that is hair design. My research demonstrates the deeper meaning and importance of hair as an art, which challenges conventional notions and perceptions of what hair salons embody or represent.

5:45

St. John Orthodox Church: How Deliberate Ritual Creates a Traditional and Meaningful Community

Laura Wiggins

Faculty Sponsor: Susan Kus, Department of Anthropology & Sociology

The use of the ethnographic method is crucial in understanding a culture "other" than one's own. This method allows one to document and interpret another culture through participation in the daily life of the culture and observation of the culture from an outside, evaluative viewpoint. Many times, one's cultural practices are not apparent unless highlighted by an "outsider." As an informed outside participant, I have found that St. John Orthodox Church is a community that is bound together through deliberate rituals. Though many traditional church cultures seem to foster routine ritual, the people of St. John Orthodox Church bring thoughtful deliberateness to their rituals in each word that is spoken and each move that is taken. From church-wide "special" events, such as Forgiveness Sunday, that encourage community building, to the repeated weekly services, to the individual interactions at weekly meals, the people of St. John Orthodox Church choose to act deliberately in all things. This deliberateness allows them to render the mundane sacred, which serves as a means of developing the tightly-knit community at St. John Orthodox Church.

Research in Anthropology and Sociology

Kennedy 208, 2:00pm – 4:30pm

Session Chair: Elizabeth Hook

2:00

Essentializing Muslim Identity

Rami Abdoch

Faculty Sponsor: Thomas McGowan, Department of Anthropology & Sociology

The subject of Islam and Muslims has been thrust into the global spotlight by recent geopolitical events and media attention. This has illustrated the phenomenon of essentialism as it relates to understanding Muslim identity in a number of contexts. Essentialism is the act of naming or defining someone/something in absolute terms according to one’s limited understanding of the other. How does essentialism affect dialogue across the “Us-Them” or “West-Islam” binaries? How is essentialism related to Orientalism? In what ways do all of these considerations bear on the structure of Muslim identity at the conscious and unconscious levels? Such questions are what drive this research.

This exploratory analysis is informed by the theoretical work of Weber and Gadamer. In-depth interviews conducted with Muslims in Memphis highlight key ways in which Muslims understand themselves and how they think they are understood by others. Ultimately, essentialism is problematic because it is interpretively violent and stifles dialogue before it can even take place.

2:15

Has the Liberal Arts Degree Lost its Luster?: Findings From a Survey of Rhodes Alumni

Heather Bishop

Faculty Sponsor: Thomas McGowan, Department of Anthropology & Sociology

Historically, the value of the liberal arts education has waxed and waned according to cultural and economic changes. This project explores how recent Rhodes graduates value their liberal arts education in light of the current economic recession. An online survey was administered to Rhodes alumni in order to study their career paths and the obstacles they have faced since graduation. Alumni were also asked whether they think a liberal arts education has become less desirable and whether such an education disadvantages them in the job market.

2:30

Understanding the Relationship Between Sexual Identity and Religious Faith Among African Americans

TonAi Doan

Faculty Sponsor: Thomas McGowan, Department of Anthropology & Sociology

This research focuses on the relationship between religious and sexual identity among African American gay, lesbian, bisexual, and transgender (GLBT) individuals. Specifically, this paper explores the intersection of social identity, personal development, and the challenges African American individuals face “coming out” to their communities. Semi-structured interviews were conducted with individuals in order to learn about the intersection of their sexual identity and faith journeys. Special attention is given to the religious backgrounds, affiliations, and experiences of the interview subjects and the formation of their sexual identity.

2:45

Academic Success of African American Students at Predominantly White Institutions versus Historically Black Colleges and Universities

Phylicia Douglas

Faculty Sponsor: Thomas McGowan, Department of Anthropology & Sociology

There is an ongoing conversation about the academic success of African American students at predominantly white institutions versus historically black colleges. Some studies show that environmental factors, personal adjustment, and demographics have a significant impact on students’ performance in the classroom. Relationships with students and faculty, campus involvement, and feelings of social isolation are all factors that can greatly affect African American students’ college experience. This paper explores the differences in the academic success of African American students by conducting in depth interviews with African American undergraduates from Rhodes College and Tennessee State University.

3:00

Ethnocentrism and the Ethics of International Research: A Community-Health Needs Assessment in Pallisa, Uganda

Chris Moore

Faculty Sponsor: Thomas McGowan, Department of Anthropology & Sociology

Institutional review boards (IRBs) were created in the US to ensure that all research projects involving human subjects are conducted ethically. However, this paper argues that IRB criteria and codes of conduct are insufficient for research as it is practiced in a cross-cultural, international setting. More specifically, a meta-analysis of research conducted by the Minority Health International Research Training Program (MHIRT) in Pallisa, Uganda, is used to identify blind spots regarding the relevance and scope of the IRB’s ethical considerations. Derrida’s notion of supplemental meaning foregrounds a discussion of community-relevant considerations missing from the IRB

criteria, e.g., how a community, rather than an individual, might be affected by the research. The absence of these community-specific considerations makes the guidelines provided by the IRB inadequate for supporting ethical research.

3:15

Women of the Cloth: Power and Identity in the Episcopal Church

Kirby Pool

Faculty Sponsor: Thomas McGowan, Department of Anthropology & Sociology

This study examines the role of female priests in the Episcopal Church. Women have only been allowed to be ordained as Episcopalian priests since the 1970s. Using a discourse analysis modeled on the work of Foucault, written discourses from both the Episcopal Church (the dominant discourse) and the sub-altern discourses from and about female priests, are compared and analyzed. These different discourses evidence how power and gender relations affect the institutional role of female priests, and the way these roles are maintained or contested through discourse.

3:30

Cross Cultural Law: An Examination of Legalizing Prostitution

Grey Robinson

Faculty Sponsor: Thomas McGowan, Department of Anthropology & Sociology

How does culture affect legislation pertaining to the sex industry? This paper presents a cross cultural comparison of laws related to prostitution and the sex industry based on an extensive literature review. Cultural factors are used to demonstrate how sex industry legislation produces both limits and benefits in eight countries in five different continents. Women's rights, country stereotypes and public opinion are among the cultural aspects examined and compared. This paper concludes that an anthropological consideration of context-specific, cultural factors is an ethical requirement of both intra-national and inter-national law.

3:45

Looking for Love in Cyberspace: Understanding the Intrigue of Online Dating

Olivia Ryan

Faculty Sponsor: Thomas McGowan, Department of Anthropology & Sociology

The use of online dating services has recently become a popular practice among college students. This research aims to identify the reasons behind Rhodes students' use of online dating sites. Specific research themes covered in this study include computer-mediated communication (CMC), fear of rejection, presentation of self/self-disclosure, and the social stigma associated with online dating. Face to face, semi-structured interviews were conducted with Rhodes students to understand these themes and the students' reasons for online dating.

4:00

Empowering Women Through Services Provided in a Domestic Shelter

Clark Smith

Faculty Sponsor: Thomas McGowan, Department of Anthropology & Sociology

In the United States a woman is beaten every fifteen seconds and two out of every five murdered women are killed by their husbands. This study focuses on the ways in which domestic violence shelters provide abused women with the skills and resources they need to leave their abusers and improve their lives. This paper presents an ethnographic study of a YWCA women's shelter and focuses on the various steps these women take to become "empowered" while living at the shelter. These steps include developing a support system, letting go of fear/guilt, becoming financially independent and regaining self-esteem. This ethnography demonstrates that among its key objectives the shelter is especially dedicated to improving the self-esteem of abused women by providing emotional and social support.

4:15

Doing Gender!: The Performance of Gender in Restaurant Kitchens

Chelsea Wakstein

Faculty Sponsor: Thomas McGowan, Department of Anthropology & Sociology

Restaurants are cultural scenes that people gather in to enjoy food and conversation. The back of the house, the kitchen, is a mysterious arena that most diners are not granted access to. This paper presents an ethnographic study that focuses on two Memphis restaurant kitchens. The particular actions, choices, and self-presentations of kitchen staffs were observed in order to consider how gender is performed in this cultural scene. Judith Butler's theoretical work on the performativity of gender is used to frame and interpret the actions observed in this study.



Buckman Fellowship

Kennedy 205, 2:45pm – 4:15pm

Session Chair: Dean Galaro

2:45

No Artificial Ingredients? Sustainable Myths and Costa Rican Realities

Brennan Lowery

Faculty Sponsor: Stephen Ceccoli, Department of International Studies

The presentation will explore the international reputation of Costa Rica, the eco-labelled developing nation often called the “Switzerland of Central America”, and the contrasts between this image and the prevailing social and political dynamics in this unique society. The focus on Costa Rican society and the contrast between ecotourism and local environmental consciousness will highlight the paradoxes of sustainable development in theory and practice. This presentation will demonstrate the complex interaction between policy, economic development, and environmental awareness in modern-day Costa Rica and its implication for developing countries.

3:00

UNASUR: Fostering Unity Among South American Countries

Neha Mehta

Faculty Sponsor: Stephen Ceccoli, Department of International Studies

During my semester in Buenos Aires, Argentina, my “Latin America in the International System” course explored an array of subjects including the history of Latin America, its transition into the twenty-first century, and the different organizations formed to politically unite Latin American countries. In particular, UNASUR, La Union de Naciones Suramericanas, emerged as a strong geopolitical force in South America and globally as well. This presentation analyzes the structure of UNASUR, its mission and accomplishments, and the journey ahead for this relatively new organization.

3:15

A Taste of Slow: Interning for Slow Food Rome

Carolina Sánchez-Hervás

Faculty Sponsor: Stephen Ceccoli, Department of International Studies

Italy is recognized internationally for its incredible food, and Slow Food stands out as one of the most progressive organizations in preserving Italy's food culture. It is an international non-profit organization that was founded in Italy. Their success in Italy has spread to over 150 countries worldwide, and is even in Memphis. An overview of my internship in Rome and initiatives in Memphis will be discussed.



3:30

Smoking Cessation in Madrid

Mae Gillespie

Faculty Sponsor: Stephen Ceccoli, Department of International Studies

I volunteered at a Madrid Hospital working in a smoking cessation clinic for Dr. Carmen Fernandez-Pinilla. The smoking cessation clinic works with individuals to break the addiction to tobacco and help improve overall health. The treatment involves some psychological assessment of the patients as well as drug prescription. For patients who exhibit depressed symptoms, treatment options also include anti-depressants. The clinic is free for anyone to attend and the drugs are subsidized by the government. My experience made me more aware of health concerns in Spain and also a better understanding of their health care system.

3:45

Peacekeeping Operations: Humanitarianism or Politics as Usual?

Sarah R Smith

Faculty Sponsor: Nuray Ibryamova, Department of International Studies

After the Cold War, International Organizations (IOs) have become the guardians of international peace and security, in charge of creating and maintaining peace in conflicts that are, for the most part, internal. Research on why IOs themselves intervene in these conflicts, however, is largely lacking. I thus look at the factors that lead to the decision by IOs to establish peacekeeping operations. I frame my study using the logic of consequences versus the logic of appropriateness debate in order to determine whether or not the decision is based on a consequential rationality or based on an IO's identity and role in society. My case studies include the United Nations (UN) and European Union (EU) peacekeeping missions in the Democratic Republic of the Congo (MONUC in 1999 and Operation Artémis in 2003, respectively) and the EU intervention, Operation Concordia (2003), in the Former Yugoslav Republic of Macedonia (FYROM). My findings reveal that security and economic interests play a large role in influencing an IOs decision to intervene by framing the way in which IOs deal with humanitarian crises and human rights situations in a conflict. In the end, my findings show that IO's base the decision to intervene on a cost-benefits analysis: if the costs of intervention outweigh the benefits, intervention will not take place. If, however, the costs outweigh the benefits of non-intervention, intervention is more likely to take place.

4:00

Protecting the World from Genocide? A Comparative Analysis of the Responsibility to Protect and the International Criminal Court

Lara K. Wagner

Faculty Sponsor: Stephen Ceccoli, Department of International Studies

In a world plagued by human rights abuses and genocide, it is essential that the international community has strong and effective institutions. Such institutions would allow the international community to enforce the accepted international norms condemning both human rights abuses and genocide. This paper focuses specifically on two such institutions: the Responsibility to Protect doctrine and the International Criminal Court, and seeks to explain why the International Criminal Court has a stronger institutional form and greater international acceptance than the Responsibility to Protect doctrine. This discussion begins with a look at the historical development of the genocide regime and how this development affects the International Criminal Court and the Responsibility to Protect doctrine. Next the form and strength of these institutions are analyzed. Finally, an institutional explanation, Elite Theory, and the Multiple Streams Model are used to explain the strength and acceptance of the International Criminal Court within the international system. The paper concludes with a discussion of possible consequences of these differing institutional forms.

NATURAL SCIENCES ORAL SESSIONS



St. Jude Summer Plus Fellowship

Frazier Jelke B, 1:00pm – 2:15pm

Session Chair: Anne Wilson

1:00

Elucidating the Role of Glycogen Synthase Kinase 3 beta in Regulating the Function of PAX3-FOXO1 by Phosphorylation

Alex Tong; Lingling Liu, Taosheng Chen, Department of Chemical Biology and Therapeutics, St. Jude Children's Research Hospital

Faculty Sponsor: Mary Miller, Department of Biology

We have shown that the GSK3beta inhibitor TWS119 can inhibit cell proliferation in alveolar rhabdomyosarcoma (ARMS) cells. Nearly 70% of ARMSs express the fusion protein PAX3-FOXO1, and previous studies have shown that GSK3beta can phosphorylate PAX3-FOXO1 in vitro. However, the specific nature of these phosphorylation events and physiological relevance of these events for TWS119 activity are not known. In this study, we used site-directed mutagenesis to evaluate a putative phosphorylation site located at the junction of the PAX3 and FOXO1 domains in the fusion protein for the site's importance in PAX3-FOXO1 functional activity. Our results show that this site can regulate PAX3-FOXO1 functional activity and strongly suggests it may be a phosphorylation site for GSK3beta. These studies provide insight to the role of PAX3-FOXO1 function in ARMS cells, important since this fusion protein is indicative of a more aggressive cancer phenotype that is resistant to conventional chemotherapy and radiotherapy. Novel strategies in treating these aggressive ARMS types might include modulating the activity of the fusion protein's target genes as well as the fusion protein's transcriptional activity, particularly through inhibiting GSK3beta.

1:15

Analysis of Rapidly Discontinued Medication Orders in CPOE May Help Identify Prescribing Errors

Maria Cartagena; James Hoffman, Jennifer Robertson, Nancy Carter, Scott Howard, Department of Oncology Information Sciences, St. Jude Children's Research Hospital

Faculty Sponsor: Jonathan Fitz Gerald, Department of Biology

Medication errors are currently the greatest contributor to medical error. Previous research has shown different error detection methods identify different numbers and types of errors. Therefore, more reliable and numerous error detection methods are needed to correctly predict error. Rapidly discontinued prescription orders (RDPOs) in electronic record systems, such as Computerized Prescriber Order Entry system (CPOE), may provide an additional affordable and reliable method to detect prescribing errors. RDPOs are electronic prescriptions that have been modified within 2 hours of being sent. Discontinuation of an order may reflect an appropriate change to patient treatment; however, rapid order change may also indicate a prescribing error. In a previous study, 67% of orders discontinued within 45 minutes of being created were deemed to be prescribing errors. In this analysis, the objective is to test this new method of detecting error at St. Jude by analyzing an estimated sample size of at least 400 discontinued orders, finding whether RDPOs are a valid and reliable method of identifying error. Another study objective is to compare error findings from CPOE with the findings of existing error reporting systems, such as Electronic Events Reporting System (EERS), in order to identify whether systems identify different error characteristics.



1:30

N- and C- Terminal Truncations to MCM 4 Lead to a Stable Subunit

Anna Magliolo; Leslie Epling and Eric Enemark, Department of Structural Biology, St. Jude Children's Research Hospital

Faculty Sponsor: Mauricio Cafiero, Department of Chemistry

DNA replication is a highly regulated and complex process that has many important checkpoints and protein complexes involved. The minichromosome maintenance (MCM) proteins have been found to play an important role in DNA replication. Specifically, MCM proteins that assemble into a closed ring hexamer are the presumed replicative helicase. Each of the six subunits is a member of the AAA+ superfamily of ATPases, and ATP hydrolysis occurs at the interface between the two subunits within the closed ring. In archaea, the MCM complex is made of six identical protein subunits, but the eukaryotic MCM complex, the subject of this study, is a heterohexamer, with the subunits designated as MCM2-7. While each of the eukaryotic subunits maintains a similarity in sequence in the C-terminal region, MCM 2-7 each varies highly at the N-terminal region, making each of the subunits unique. In examining the individual subunit MCM4, systematic truncations were made initially at the N-terminal, with additional truncations then made at the C-terminal portion of the gene. From the truncations made, a stable domain was discovered at the N-terminal region of MCM4. This stable domain includes a documented functional mutation designated as chaos3, a point mutation that can lead to mammary adenocarcinomas.

1:45

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

Van Phan; Hans Häcker, Department of Infectious Disease, St. Jude Children's Research Hospital

Faculty Sponsor: Darlene Loprete, Department of Chemistry

Influenza virus is an important human pathogen responsible for annual epidemics and occasional, devastating pandemics. The genomes of influenza viruses encode 11 known proteins. One of these proteins, the non-structural protein 1 (NS1) is known to be essential for virus pathogenicity, yet its molecular mechanism of action is only partially defined. Our lab has identified a novel NS1-interacting host protein, the 'zinc-finger antiviral protein' (ZAP). This protein has previously been shown to interfere with virus replication of a distinct set of other viruses. This project focuses on the investigation of the so-far uncharacterized function of human ZAP in Influenza biology. We first established experimental systems for overexpression and knock-down of hZAP. We have successfully cloned hZAP into mammalian expression vectors (for overexpression) and also established a lentiviral shRNA knock-down construct, which reduces hZAP-mRNA and -protein levels significantly when stably introduced into HEK293T cells. We will use these systems to analyze critical infection-associated parameters, such as virus replication, cytokine production and apoptosis. We expect that these experiments will reveal the biological significance of hZAP as an NS1-interacting protein. As such, these results may contribute to our understanding how Influenza A viruses control pathogenicity, and possibly identify a novel antiviral drug target.

2:00

Development of curcumin-based derivatives as inhibitors to human intestinal carboxylesterase

Maha Bano; Jason Hatfield and Philip M. Potter, Department of Chemical Biology and Therapeutics, St. Jude Children's Research Hospital

Faculty Sponsor: Laura Luque de Johnson, Department of Biology

The anticancer prodrug CPT-11 is converted to its active metabolite SN-38 primarily by carboxylesterases (CE), a class of ubiquitous enzymes. In the human body, human liver CE (hCE1) and human intestinal CE (hiCE) have been identified as demonstrating significant ability to hydrolyze the drug. The high level of hiCE that is expressed in the gut suspected to be responsible for the dose-limiting toxicity of CPT-11. Curcumin, a component of the dietary spice turmeric, has been found to be an inhibitor of hiCE. The poor bioavailability of orally administered curcumin in the plasma makes it a good platform for development of an inhibitor that is limited to the gut since systematic inhibition of hiCE is undesirable. Although curcumin was found to inhibit hiCE, the mechanism behind its inhibition is not known. Therefore, we synthesized derivatives of curcumin through an aldol condensation-type reaction using benzaldehyde derivatives and acetylacetone. The derivatives were then characterized using NMR, melting points,

mass spectrometry and finally assayed for CE inhibition. The derivatives with electron-donating substituents in the aromatic aldehydes yielded better inhibitors than those with electron-withdrawing substituents. One of these derivatives may become a suitable inhibitor for clinical use, with the purpose of reducing CPT-11's dose-limiting toxicity.

2:15

A Robust Method for Reducing Inflow Artifacts in Arterial Input Function of DCE-MRI Datasets and Sectorial Quantification of Localized Renal Perfusion

Duan Yutong; R. B. Loeffler, R. Song, A. Tipirneni, C. M. Hillenbrand, Department of Radiological Sciences, St. Jude Children's Research Hospital; N. Oesingmann, Siemens Medical Solutions USA, Inc.

Faculty Sponsor: Ann Viano, Department of Physics

Conventional methods for renal perfusion measurement require timed blood and/or urine collections, and may carry the risk of nephropathy due to nephrotoxic contrast agents and lengthy exposure to ionizing radiation, whereas MRI methods using gadolinium chelates (most commonly Gd-DTPA), which are solely filtered through glomeruli, can noninvasively provide excellent anatomical resolution and an accurate estimate of Glomerular Filtration Rate (GFR). Most renal perfusion models require the Arterial Input Function (AIF) to be known and model the contrast bolus and GFR as a global estimate of kidney function. However, pulsatile inflow effects due to the heartbeat can cause distinct noise in the AIF signal measured within the descending aorta, leading to overestimation of AIF. Currently the lack of spatially resolved perfusion measurement also impedes assessment of varied perfusion in different regions within the kidney, which is especially desired for patients who received radiation therapy that unevenly affected the kidney. This study includes statistical techniques that smooth the signal intensity curve by removing the spikes due to inflow effects, a simulation test that validates this optimization with multiple extracted noise sets, and an experimental program that enables localized quantification of renal perfusion by sectoring the kidney and calculating the sectorial GFR.

Conservation and the Environment

Frazier Jelke A, 1:00pm – 2:30pm

Session Chair: Tiffany France

1:00

Reproductive monitoring techniques in male snow leopards: testosterone levels as indicators of reproductive health

Kimber Jones; Andrew Kouba, Erin Willis, Memphis Zoo

Faculty Sponsor: Sarah Boyle, Department of Biology

To aid in the conservation of endangered snow leopards, a non-invasive technique to monitor reproductive hormone levels was developed in our laboratory. For this study, fecal samples were collected every other day from male leopards in zoos across the nation. Fecals were dried for 48-72 hours, ground, and extracted with an optimized methanol protocol. An enzyme immunoassay for testosterone was then validated to quantify male reproductive steroid levels. Preliminary results from a healthy breeding aged male showed an average testosterone level of 158.6 ng/g feces. In comparison, a pre-pubertal male exhibited low levels (81.1 ng/g) throughout most of the collection period. However, in more recent samples, his levels were comparable to the breeding aged male (129.7 ng/g) suggesting the onset of puberty. Another breeding aged male showed extremely low levels of testosterone (61.9 ng/g) that could be associated with infertility. Continued sample collection and analysis will help to determine possible trends due to animal age and season. Results from this study will improve captive breeding efforts and aid in conservation efforts as a whole. Our findings can also be used for comparison between other captive animals and, eventually, wild individuals in order to monitor reproductive health in this rare species.



1:15

Monitoring Fertility in Snow Leopards (*Panthera unica*) through Noninvasive Fecal Steroids

Chelsea Peters; Andrew Kouba, Erin Willis, Memphis Zoo

Faculty Sponsor: Darlene Loprete, Department of Chemistry

Snow leopards (*Panthera uncia*) are an endangered species and little is known about their reproductive physiology. Our laboratory utilized a non-invasive method of fecal hormone extraction and analysis to monitor reproductive steroid levels to aid captive breeding efforts. Fecal samples were collected from female leopards in zoos around the U.S. Hormones were extracted from dried/ground samples using methanol. Concentrations of reproductive hormones were then analyzed by enzyme immunoassay using a broad-scale antibody for progestagens and a specific antibody for an estrogen metabolite, E1G. In three animals, SB2010, SB2013, SB2664, preliminary results indicate that this species is strictly an induced ovulator. The average follicular phase length was 16 days and the average baseline E1G concentrations were 484.52ng/ml and 503.8ng/ml in SB2013 and SB2664, respectfully. The average baseline for SB2010 was 180.0ng/ml, indicating possible sub-fertility. Seasonality and potential heat stress were observed in a larger completed data set for SB2013. Further analysis of these animals and other animals on the study will help to determine the effects of season, age, and housing factors on reproductive health. Results from this study, will further the knowledge of this species' reproductive physiology and could be used for comparison to snow leopards in the wild.

1:30



Spatial analysis of parasites in snakes in Overton Park: Does having an infected neighbor affect you?

Anna Johnson, Adiha Khan, Matt Grisham, Matthew McCravy, Kimber Jones, Sarah Boyle, Laura Luque de Johnson

Faculty Sponsor: Jon Davis, Department of Biology

Parasitism is a successful life strategy with numerous ecological and physiological impacts, and urbanization influences parasitism and disease transmission in wildlife and humans. The effects of parasitism on snakes have not been greatly studied, and the role of snakes in parasite transmission, particularly in urban environments is widely unknown. We integrated numerous field, histological, and molecular techniques to assess ecto-, hemo- and fecal parasitism in 34 wild caught snakes living in Overton Park. We used Geographic Information System (GIS) spatial analysis to investigate if the snakes' distance to forest disturbance or to its nearest infected neighbor were correlated with parasite prevalence. We also used GIS to determine if the distribution of any of the 3 different types of parasite prevalence were uniform, random, or clumped. Mean distance to disturbance (forest or concrete) was 45.9m, and mean distances to neighbor infected with *Plasmodium* and *Hepatozoon* sp. were 137.8m and 131.6m respectively. However, mean distance to any neighbor was 59.6m. Distance to disturbance or to infected neighbor did not correlate with parasite prevalence, as infection was widespread throughout Overton Park. The results of this study will be used to further investigate the ecological significance of parasitism in snakes.

1:45

New Madrid and the Mississippi: Exploring the Relationship between People and Nature

Lee Bryant

Faculty Sponsor: Rosanna Cappellato, Department of Biology

The Mississippi River is arguably the most powerful river in the United States. Its watershed covers over 41% of the land area in the continental states, a total of about 3,000,000 km², and drains 31 states and 2 Canadian provinces. With regards to length, discharge, and sediment yield, it is the third, eighth, and sixth, respectively, largest river in the world. The effects of engineering modifications, invasive species, floodplain function, wetland loss, land loss in the delta area, nutrient overload, and water pollution have been studied and discussed in a multitude of scholarly papers. However, the Mississippi River not only has biological and ecological importance but also anthropological importance, which is crucial in understanding the connection between the river and the people who live alongside it. New Madrid, Missouri, serves as an example town for exploring this anthropological importance because of its rich history of harnessing and adjusting to the power of the Mississippi. Understanding the connection between people



and the Mississippi River in towns like New Madrid will provide future researchers a better understanding of how to approach environmental issues in order to benefit both the people and the river.

2:00

Using GIS to Identify Future Grassroots Organization Partners for GlobeMed

June Mi Elisha Kang

Faculty Sponsor: Sarah Boyle, Department of Biology

According to the World Development Report 2000/2001 by the World Bank, one billion people lack access to health care systems. In order to address this issue, students from 32 universities around the U.S. have gathered as members of GlobeMed, a network of student-run nonprofit organizations that partner with Nongovernmental Organizations in developing countries. Each chapter partners with a grassroots health organization in the developing world, and they collaborate to improve the health of impoverished people across the world. While one of the approaches in realizing its vision is identifying and recruiting partner grassroots organizations, GlobeMed has lacked efficient means in identifying its new partners. Therefore, using Geographic Information Systems (GIS), I identified grassroots organizations that are located in the areas where healthcare problems are prevalent and no connection has yet been established with GlobeMed. I first linked the chapters and their partnered organizations and identified the types of the grassroots organizations and their projects. I then determined healthcare status of each country by mapping factors such as maternal mortality rate, infant mortality rate, number of hospitals in the region, and accessibility to clean water. Lastly, I located grassroots organizations working towards health equity goals to find future partners for GlobeMed.

2:15



Presenting the Vanuxem Collection

Bert Geyer

Faculty Sponsor: Jennifer Houghton, Department of Biology

The Vanuxem geology collection was amassed by the prominent early 19th century geologist, Lardner Vanuxem. After Vanuxem's death, the collection was obtained by Rhodes (then Stewart College) and used as a teaching tool. Since the 1920s the majority of the collection has been stored in disorder and unused. The task of bringing the collection out of obscurity and revitalizing it as a Rhodes asset has been an interdisciplinary endeavor spanning the realms of geology, scientific history, and design. The collection was first unpacked and inventoried. Then Vanuxem's career pursuits and findings were investigated in order to place the collection into context. The final and most intensive step was designing a display for select specimens to be showcased on campus. This presentation will focus on the design and construction process of the display. It will describe how the problem of displaying the collection was realized and addressed and how the solution is articulated in the design.

Quantitative and Computational Science

Frazier Jelke B, 2:30pm – 4:30pm

Session Chair: Stephanie Milazzo

2:30

Use of MP2, DFT and semi-empirical calculations of protein-ligand interaction energies and ab initio QSAR in the development of novel statin drugs

Allison Price

Faculty Sponsor: Mauricio Cafiero, Department of Chemistry

Previous work (J. Phys. Chem. B, 113, 14810, 2009) has shown that the residue Tyr479 in the active site of 3-hydroxy-3-methylglutaryl-coenzyme A (HMG-CoA) reductase exerts a strong attraction on ligands. Statin drugs moderate blood cholesterol levels by acting as competitive inhibitors, blocking the biosynthesis of cholesterol early in the synthesis pathway. In this work, novel molecular fragments that bind strongly to all areas of the active site have been developed using ab initio correlated methods and attached to known statin drugs to create novel drug candidates that interact more strongly with the enzyme than the original drugs. Interaction energies between small molecule ligands and the target enzyme active site are calculated with all-electron correlated methods such as, MP2



and DFT, as well as semi-empirical methods. Various molecular properties of known statin drugs were also correlated to the values of the *in vivo* potencies (the pIC₅₀) of each drug in order to derive quantitative structure/activity trends. We are currently working on a second generation of drugs. The drug candidates that include the tail mentioned above were optimized with modifications to the statin moiety. The calculated interaction energies of these second generation drugs look promising.

2:45

Investigating the Force Between Two Electrically Charged Spheres

Evan Nelsen

Faculty Sponsor: Shubho Banerjee, Department of Physics

The familiar Coulomb's Law is an essential part of the curriculum for first year physics students. Its formula, however, is relevant only for idealized point charges. It serves as a good approximation for conducting objects at large distances, but becomes inaccurate as the objects get closer. Our investigation focused on analyzing the force between two conducting charged spheres at different distances. The goal of the investigation was to numerically calculate the force for each of the chosen distances for spheres of various charge and size ratios so that a generalized approximation formula can be found.

3:00

Monte Carlo Pricing of Derivative Securities and Uncertainty in Volatility Estimation

Adam Joplin

Faculty Sponsor: Jeff Hamrick, Department of Mathematics & Computer Science

In the standard time-inhomogeneous diffusion model, estimation of the volatility function is far more important for Monte Carlo pricing than estimation of the drift function (due to a standard application of Girsanov's Theorem). As such, we study the distribution of option prices under the uncertainty of volatility function estimation. First, we run Monte Carlo simulations to price a variety of options using a fixed estimate of the volatility function. Then, we run Monte Carlo simulations to price a variety of options using a bootstrapped re-estimation of volatility function in each Monte Carlo trial. The differences in the resulting distributions of option prices may have implications for thinking about the bid-ask spread on an option price, and can be compared to historical data to gain a more complete perspective on the acceptability of American option prices.

3:15

Quantum chemical analysis of ligand binding in the dopa decarboxylase active site and in silico design of novel ligands with improved active site binding affinity

Caroline Lee

Faculty Sponsor: Mauricio Cafiero, Department of Chemistry

Serotonin and dopamine are essential neurotransmitters, which if present in lower than normal concentrations, can cause psychological disorders such as OCD and panic disorders or diseases such as Alzheimer's and Parkinson's. Previous work in our group has focused on the binding of the ligand PLP (an enzyme cofactor used in serotonin and dopamine synthesis) and carbidopa (a Parkinson's drug) to aromatic amino acid decarboxylase (AAAD or dopa decarboxylase). In this work, we perform a high accuracy quantitative study of how 5-HTP and L-DOPA--precursors to serotonin and dopamine--bind to the dopa decarboxylase active site. By studying the binding of these ligands, and other ligands which also target this active site, we have designed and docked ligands with optimal binding affinity which may competitively inhibit the binding of 5-HTP and L-DOPA, thus preventing production of serotonin and dopamine. Interaction energies between all docked ligands and residues in the enzyme active site are calculated using counterpoise corrected MP2 calculations, Density Functional Theory, and a few benchmark CCSD(T) calculations.



3:30

A True Remote Control Car

Cynthia Bitters, Joseph Svejkosky, Brian Yuan, Laney Mills, Jessica Cowan

Faculty Sponsor: Eric Breck, Department of Mathematics & Computer Science

The goal of this project is to be able to control a modified remote control car from a computer with internet access over a cellular network. This will be accomplished by attaching an Android-based cell phone to the car and utilizing the phone's camera capabilities so that the user does not have to be within sight of the car in order to control it. The computer will display live video feed and serve as the interface for controlling the car. This project can be broken down into three main components of communication. The first component is the communication between the Android-based phone and the computer. This communication takes place over a cellular network using a server client based protocol. The second component is the communication between the car and the phone via Bluetooth. Both the Bluetooth module and the phone are mounted onto the car. The third component is the communication between the Bluetooth module and a microcontroller. The microcontroller interprets the Bluetooth signals in order to control the servos and motors of the car. Through the combination of these three components the user will be able to control the modified remote control car while receiving live video feedback.

3:45

Increasingly complex models for intercalation of a planar molecule between DNA bases: MP2, DFT, and ONIOM results

Michelle Shroyer

Faculty Sponsor: Mauricio Cafiero, Department of Chemistry

This work focuses on the binding of a model intercalant (indole) between the ten pairings of the four DNA bases in order to ascertain the most likely location of the binding of a carcinogen or chemotherapeutic drug. This knowledge will aid in the design and targeting of future chemotherapy drugs. The ten complexes (DNA base-intercalant-DNA base) were optimized into the free structure and sandwich structure using MP2/6-31g. Interaction energies were computed for these complexes using MP2 and DFT methods with the 6-31+g* and 6-311+g* basis sets. Comparison of the stability of the free structures to the stability of the sandwich structures, allowed estimation of the distorting force acting on that segment of DNA. A short strand of DNA with an intercalant bound in between two bases was studied using the ONIOM method. MP2 and DFT methods were used to model the interactions between the bases and the intercalant, while AM1 was used to model the DNA backbone. These calculations are crucial because the manner in which DNA distorts depends heavily on the backbone and the presence of the neighboring DNA bases. Finally, models of the intercalant bound between pairs of two bases in double stranded DNA were modeled using ONIOM.

4:00

Nonlinear Regression with Conditionally Stable Innovations: A New Definition of Financial Contagion

Eric G. Stradley

Faculty Sponsor: Jeff Hamrick, Department of Mathematics & Computer Science

We develop a new notion of financial contagion, or the spread of negative characteristics from one market to another, by fitting a conditionally stable model to residuals extracted from a nonlinear regression. More specifically, we estimate the return on a dependent market given the return on an independent market using a spline-based local mean function. Then, instead of assuming that the residuals have a Gaussian distribution, we assume that the residuals are independent stable random variables when conditioned on the covariate market return. In general, the stable distribution depends on four parameters, two of which control skewness and tail heaviness. With our approach, these parameters become functions that are nonparametrically estimated. For various dependent markets, we study the change in the skewness and heaviness functions from the median to the tail of an associated covariate market return distribution. After bootstrapping the results of our function estimation, we test whether, given a value in the tail of the covariate market return distribution, the residuals are more likely to be left-skewed or heavy at the left tail than at the median of the distribution.

4:15

MP2 and DFT calculations of the interaction energies between boronated aromatic molecules and small DNA models: applications to cancer therapy

Kelly Allison

Faculty Sponsor: Mauricio Cafiero, Department of Chemistry

Boronated molecules are seeing increased use in pharmacological applications including cancer therapy. In boron-neutron capture therapy, boronated molecules are bombarded with slow neutrons in order to instigate cell death in tumors. Thus, the ability to target boronated molecules to specific areas in the body is crucial. Previous research in our group has examined how boronated aromatic molecules interact with other small molecule models and solvents. This work examines possible localization of boronated molecules in DNA by examining the differences in interaction energies between boronated and non-boronated small molecule ligands with nucleic acid models. We have created complexes of single and double-ringed boronated and non-boronated aromatic ligands with different nucleic acid sequences (AA, TT, GG, etc.) and optimized their structures. Counterpoise corrected interaction energies have been calculated using MP2 and various DFT functionals (local, GGA, and meta-GGA) and the 6-31+g* and 6-311+g* basis sets. Preliminary results show consistent differences in binding between boronated molecules and non-boronated molecules to nucleic acids.

Genetics, Biochemistry and Molecular Biology

Frazier Jelke B, 2:45pm – 4:00pm

Session Chair: Matt McCravy

2:45



Competition Crosses as a Means of Studying the Parental Conflict Hypothesis in Arabidopsis thaliana

Sara Beth Taylor

Faculty Sponsor: Jonathan Fitz Gerald, Department of Biology

Imprinted genes are those whose expression may be silenced when inherited from one parent, but remain expressed when inherited from the other. Mutants unable to imprint genes demonstrate that paternal imprinting acts to increase offspring size, while maternal imprinting acts to counter this effect. The Parental Conflict Hypothesis (PCH) explains this epigenetic antagonism, suggesting that imprinting is a mechanism by which fathers produce successful offspring that can outcompete their siblings. Previous results have suggested that imprinting programs in Arabidopsis thaliana change between individuals isolated from different locations. According to PCH, these variations between populations would stem from the evolution of ‘strong mothers’ or ‘strong fathers’ that better regulate offspring size in outcrosses. We have initiated a series of “competition crosses” in which the pollen of multiple father plants will be crossed onto a single stigma of a mother plant. The phenotypes of these individuals will either demonstrate a competition between siblings, in support of PCH, or point towards other explanations for gene imprinting. As an alternative model, we predict that, instead of competition, we will find altered seed sizes as a result of a global maternal response to foreign pollen.

3:00

High levels of microRNA-210 in rheumatoid arthritis

Emily Woods; Caroline Ospelt, Astrid Jüngel, Center for Experimental Rheumatology, University of Zürich, Switzerland

Faculty Sponsor: Loretta Jackson-Hayes, Department of Chemistry

Previous studies have established that a range of microRNAs (miRNA) are induced by hypoxia in a number of cell types. Despite the prevalence of hypoxia in rheumatoid arthritis (RA) synovia, no studies have examined the effect of hypoxia on miRNAs in RA. In this study, RNA was isolated from synovial fibroblasts exposed to hypoxic conditions (1% O₂) and from synovial tissues. The expression of miR-106b, -203, -210 and selected predicted targets for miR-210 were analyzed by Real-time-PCR. Expression of miR-210 is increased after 20 hours in hypoxia in RA synovial fibroblasts (RASf) and in osteoarthritis synovial fibroblasts (OASf). In addition, the expression of



miR-210 was significantly higher in RA versus OA synovial tissues. Analysis of genes modulated by hypoxia in RASF identified RASSF5, SUMO3, IL-12A as possible miR-210 target genes. The increased expression of miR-210 under hypoxic conditions may have implications for the activated and apoptosis-resistant phenotype of RASFs, due to the likely relationship to RASSF5, SUMO3, and IL-12A. The down regulation of these genes via miR-210 may help RASF to adapt to the hypoxic and inflammatory environment in RA joints.

3:15

Exposure to ruthenium-based chemotherapeutic KP1019 delays cell cycle progression in *S. cerevisiae*.

Rebecca Miller; Pamela Hanson, Department of Biology, Birmingham-Southern College

Faculty Sponsor: Mary Miller, Department of Biology

The ruthenium-based Trans-[tetrachlorobis(1H-indazole)ruthenate(III)] (KP1019) has shown to be a promising alternative to traditional platinum-based therapies, exhibiting dose-dependent activity against a variety of explanted human tumors and preclinical tumor models. Although the true mechanism of action of KP1019 remains uncertain, oxidative stress caused by Ru(II) has been shown to play a key role in its cytotoxic capabilities, and may be linked to DNA damage. In our experiment, we investigated *Saccharomyces cerevisiae* as a potential model system in order to further our understanding of the mechanism of action of KP1019. Our goal was to determine the effects of KP1019 on the cell cycle progression of *S. cerevisiae* with regard to nuclear and cellular morphology. We found that increasing concentrations of KP1019 lead to the accumulation of large budded cells with dumbbell shaped nuclei that spanned the bud neck. We observed that cells treated with KP1019 continued to grow during this cell cycle delay, as was evident by an increase in cell size of KP1019-treated cells compared to untreated cells. Overall, our evidence suggests that KP1019 triggers a cell cycle delay in *S. cerevisiae* rather than terminal arrest.

3:30

Good as new? Morphological and biochemical analyses reveal variation between original and regenerated lizard tails.

Ted S. Boozalis, Landon T. LaSalle

Faculty Sponsor: Jon Davis, Department of Biology

Caudal autotomy, or voluntary self-amputation of the tail, is a common and effective predator evasion mechanism used by most lizard species. The tail contributes to a multitude of biological functions such as locomotion, energetics, and social interactions, and thus there are often costs associated with autotomy. Notably, relatively little is known regarding bioenergetic costs of caudal autotomy in lizards, though key morphological differences exist between the original and regenerated tail that could alter the biochemistry and energetics. Therefore, we investigated lizard caudal biochemical content before and after regeneration. Specifically, we integrated biochemical and morphological analyses to quantify protein and lipid content in original and regenerated tails. All lizards lost significant body mass due to autotomy and results indicated that regenerated tails of three gecko species contain less protein and more lipid than original tails. Interestingly, contrasting results were observed in the skink species studied. Results of this study contribute further understanding of the biochemical consequences of a widespread predator evasion mechanism.

3:45



Parental Imprinting of the *Fla12* and *Rop2* genes in *Arabidopsis*

Brittany Pope

Faculty Sponsor: Jonathan Fitz Gerald, Department of Biology

Genomic imprinting is a biological mechanism which determines whether the expressed copy of a gene comes from the mother or from the father. For example, the formin AtFH5 is expressed in the posterior pole of the *Arabidopsis* endosperm however only the maternal copy of this gene is active. Previous work has suggested genetic or physical interactions between AtFH5 and the genes ROP2, a Rho-like GTPase which controls actin-dependent pollen tube growth and H₂O₂-dependent defense responses, and FLA12, an arabinogalactan protein which controls the timing of flowering. We hypothesized that putative interactions with the maternally expressed AtFH5 would themselves show parental bias in expression. Using polymorphisms between Landsberg (Ler) and Cape Verde Island (Cvi) strains of *Arabidopsis*, we demonstrated that ROP2 is maternally expressed in Ler but biallelically expressed in Cvi.

FLA12 is still under study. Because the varying genomes used arose in separate ecological environments, this result suggests that imprinting programs can reflect an adaptive trait. Different environments may promote the imprinting of distinct classes of genes.

POSTER SESSION

Multi-sports forum of the Bryan Campus Life Center, 4:30pm – 6:15pm

Fine Arts & Humanities

#8 Harp Ensemble Outreach and Community Impact

Amber Owens, Gina Neupert, Mae Gillespie, Ye Zheng, Lin Qiu, Suzanne East, Kelly Dodson, Leerin Campbell

Faculty Sponsor: Gina Neupert, Department of Music

The Harp Ensemble has continued their outreach program over the last year enabling the group to play for more members of the Memphis community. Many people that would not normally be exposed to harp music have been able to enjoy the music the Harp Ensemble has presented. The focus of the harp ensemble was to touch the lives and provide a release from daily stress and worries for patients, students, and the general public. The harp ensemble has encouraged music education in the community as well as fostered a link to Rhodes College through their extensive involvement in local events this last year. The Ensemble is a regularly featured group at the Memphis Zoo “Zoo Lights” in the winter. The production of a CD of the harp ensemble allowed for the music to be distributed in the community so that many more people could enjoy the musical enrichment the Harp Ensemble provides. 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.

#9 Linguistics of CSL and Deaf Education in China

Katherine Klein

Faculty Sponsor: Lori Garner, Department of English

This research focuses linguistically on the similarities between ASL as a visually based form of communication and Chinese as an ideographic language and systemically on gains in Chinese deaf education over the past few decades. Deaf education has only recently started to be viewed by the Chinese as a valid form of learning. In the past, deaf children were seen as defective and impossible to educate (Mathur and Napoli, 2010; Hui, Johnson, Lytle, 2005). The hardships of Chinese deaf education lie in that Chinese is a tonal language, meaning one syllable could mean 20 different things depending on the tone and context. Consequently, lip reading is almost impossible, and integration of deaf Chinese into modern Chinese society is extremely difficult. All sign languages share some linguistic similarities, but research suggests that Chinese and Japanese as logographic and ideographic languages stimulate the lobes of the brain responsible for visual perception and comprehension. Speakers of Japanese and Chinese regularly outperform English speakers on spatial memory tests (Flaherty and Moran, 2004). If the brains of logographic language speakers process visual information similarly to that of signers, these similarities might have implications for CSL signers trying to acquire Chinese language skills, or vice versa.

#10 The effect of ASL learning on older special- needs children

Jasper Page

Faculty Sponsor: Lori Garner, Department of English

The goal of this study has been to find out if people who do not acquire language by a certain age, will be able to learn and communicate effectively in American Sign Language. According to linguistics expert George Yule, first language acquisition is usually gained during the early stages of a child’s life and is very difficult to acquire as one ages; however, from interacting with an autistic relative who does not talk, I have witnessed firsthand that he often

communicates in what appears to be sign language, albeit different to the signs present in ASL. Thus, he has not yet fully acquired, the first language, but is making minute steps toward the acquisition. What I found out is that if the individual is unmotivated to learn, or does not understand the benefit or reward from learning, the person will not participate in signing. After researching and reading the different models of ASL learning, I found a new approach to teaching sign language from John Bonvillian called Behavior Modification, which incorporates positive reinforcement. From this second approach, the subject participated more and retained some signs. I concluded that although the subject may not fully be able to communicate in the L1 (first language), he will be able to reproduce simple signs necessary for everyday life.

#11 Deriving Strength from Struggle: The History of Deaf and Hard-of-Hearing Communities

Elisabeth Peel

Faculty Sponsor: Lori Garner, Department of English

Throughout the history of signed languages, opposition has always played a factor in the language's development. American Sign Language has overcome political opposition to the language as a means to communicate and social opposition for not being the accepted language of the majority of the country. Laws in the 19th century did not favor the deaf, who were seen as dependents who would disrupt the balance of the political, economic, and social systems (Douglas, 2006). However, the hardships that deaf signers have had to endure have closely bonded the deaf community. Deaf communities have formed social systems, established schools, and fought for their right to communicate. The event "Deaf Way" has been a means for deaf people across the country to rally together and share their experiences (Ford, 2002). Gallaudet University was a break-through for deaf education. Even here in Memphis there is a strong bond between the members of the deaf community. Like most oppressed minorities, the deaf and hard-of-hearing found strength in their struggle to be accepted and acknowledged, and this study follows this trend in the cases of Deaf Way, US policy of the use of sign language, and even the example of Memphis's own deaf community.

#12 Reverse Audism & the Consequences of Deaf-Hearing Culture Clash

Phoebe Strom

Faculty Sponsor: Lori Garner, Department of English

The systematic marginalization and oppression of deaf and hard of hearing individuals has existed in various forms for hundreds of years. From the outright killing of deaf children in some ancient and aboriginal societies and the institutionalizing of the deaf in mental facilities until the 1800s in Eastern Europe, to the ongoing suppression of sign language in some third world nations and the campaigns for federally mandated cochlear implants in the modern United States, the intersection of the deaf and hearing communities has produced audism, discrimination against people because of their lack of hearing. The development of the notion that the hearing are morally and culturally superior to the hearing-impaired has created an environment of paternalistic hostility towards the deaf and hard of hearing, which has, in turn, caused a backlash in the deaf community, creating a type of reverse-discrimination against the hearing and trapping all in a cycle of prejudice and misunderstanding. Avoiding these negative outcomes requires a moderated approach, in which both sides compromise their extremely polarizing beliefs; currently, several public schools and outreach programs in Memphis provide models of positive progress in this area.

Biology & Biochemistry

#13 Absence of Sexually Dimorphic Second to Fourth (2D:4D) Toe Length Ratios in Striped Newts (*Notophthalmus perstriatus*)

Phillip Lyons; Jen Germano, Andrew Kouba, Memphis Zoo

Faculty Sponsor: Sarah Boyle, Department of Biology

Sexual dimorphism in digit length ratios of the second and fourth digit (2D:4D) has been described in humans and other species of the mammalian, reptilian, and avian genera. Prenatal exposure to androgen influences hox gene expression and is believed to be connected to dimorphism in the 2D:4D ratios of males and females. Within

amphibians, 2D:4D sexual dimorphism has not been studied in detail and knowledge is limited to two species of anurans. Of these, the Strawberry Poison Dart frog (*Oophaga pumilo*) exhibits 2D:4D sexual dimorphism, whereas the Maud Island frog (*Leiopelma pakeka*) does not exhibit 2D:4D sexual dimorphism. Digit ratio has not been investigated in amphibian species within the order caudata. The aim of this project was to test for sexual differences in 2D:4D ratios in striped newts (*Notophthalmus perstriatus*). No significant differences were present between sexes in 2D:4D ratios for any of the newts' four feet.

#14 Characterizing the estrous cycle of critically endangered Amur leopards

Jordan Perchik, Nicholas Brydon, Stephen Leavelle, Allison Graham, Rhodes College; Lauren Starkey, Emma Lendt, Andrew Kouba, Erin Willis, Memphis Zoo

Faculty Sponsor: Sarah Boyle, Department of Biology

The reproductive biology of the endangered Amur leopard, *Panthera pardus orientalis*, is not fully understood. In this study, we monitored reproductive steroid hormone levels in captive female leopards over time. Fecal samples were collected from animals in multiple U.S. zoos. Samples were then dried and ground and hormones were extracted using methanol. The concentrations of estrogens and progestagens were determined using an enzyme immuno-assay that utilized an antibody for the estrogen metabolite, estrone glucuronide (E1G) and a broad-scale antibody for both native and metabolized progestagens. Preliminary results indicated that the average baseline levels were 482 for E1G and 954 ng/gram of feces for progestagens (n=4). The follicular and luteal phases were then determined by calculating peaks above baseline for E1G and progestagens, respectively. The average follicular phase length for the female Amur leopard was 19.6 days and the average luteal phase length was 50 days, for an average estrous cycle of 70 days. Although most felids are considered induced ovulators, we observed spontaneous ovulation in one non-breeding Amur leopard. By increasing our understanding of estrous cycles of captive Amur leopard females, we hope to improve conservation efforts by refining captive breeding and extending our research to the wild population.

#15 The Old Firestone Tire and Rubber Plant and Potential Brownfields on Firestone Avenue in Memphis, TN

Sarah Tchang

Faculty Sponsor: Rosanna Cappellato, Department of Biology

In 1937, a Firestone tire and rubber plant opened on Firestone Avenue in the New Chicago area of North Memphis. By 1956, it had become one of the largest manufacturers of tires in the world, and it provided thousands of Memphians with jobs. Due to the economic downturn and automotive competition, the plant closed in 1983. The old Firestone plant site, a former brownfield, is currently owned by the Mid-South Junior Golf Association, who has significantly improved the conditions of the site for the community. At this time, Firestone Avenue has five potential brownfields, which have delayed the socioeconomic growth of the New Chicago community. These sites are the target of an EPA assessment grant which will fund the cleaning and the revitalization of this area. My research has gathered the necessary historical information and environmental conditions for phase I assessments of the potential brownfields neighboring the old plant site. According to my findings, these sites have the ability to be reclaimed and become productive areas of the community like the former plant. With the assistance of this grant, Firestone Avenue and the entire New Chicago area have the potential to become a thriving, environmentally sustainable community.

#16 Memphis Restaurants Reduce Waste in Landfills with the Help of Project Green Fork

Sarah Tchang

Faculty Sponsor: Sarah Boyle, Department of Biology

The average restaurant in the United States generates approximately 50,000 pounds of waste every year, yet restaurants could recycle or compost about 95 percent of this waste. In order to decrease environmental impacts in Memphis area, Project Green Fork (PGF), a non-profit organization, has committed to making restaurants more sustainable. PGF promotes kitchen composting, recycling, reducing energy and water consumption, the use of sustainable products, pollution prevention, and the growth of local restaurants. Even though this organization was established less than three years ago in August 2008, so far it has certified 30 restaurants as "PGF Sustainable," and by doing so, PGF has made the Mid-South more sustainable one restaurant at a time. My project concentrates on how PGF has significantly decreased restaurant waste accumulation in Mid-South landfills. With the use of Geographic Information Systems (GIS), I mapped the PGF restaurants in Memphis, Germantown, and Collierville. I

compiled a list of recycled materials (e.g. cardboard, aluminum, glass, plastic, and paper) and analyzed the quantity of recycled items on a monthly basis. My analysis highlights locations in Shelby County that would benefit from PGF sponsorship. In conclusion, this research promotes the growth of sustainable restaurants in the Mid-South.

#17 Industrial Mercury Emissions' effect on Mercury Concentrations in Soil and Wetland Water Near Recreational Areas in Memphis

Tiara Brice

Faculty Sponsor: Rosanna Cappellato, Department of Biology

Mercury (Hg) is a chemical element that has detrimental health and developmental effects when released, absorbed, and bioaccumulated within the natural environment. Coal-fired power plants and oil refineries are two of the major sources of anthropogenic Hg emissions in urban areas. Different species of Hg are transferred, stored, and cycled within plants, soil, water and the atmosphere. Soil and water samples were collected at Fuller Park, a park located 3.33 miles from the TVA Allen Fossil Plant and 5.76 miles from Valero Refinery. Soil samples were also collected from Overton Park as a control environment. Samples were analyzed with an oxygenated decomposition furnace at the University of Mississippi in Oxford, MS. Water samples were analyzed with a phase separator at the same laboratory. Preliminary results showed high levels of soil Hg (an average of 110.7595686 ug/Kg) in Fuller, values comparable with Hg soil concentrations of soil near a coal-fired power plant in China. Results will help to assert whether two of the main local anthropogenic Hg emitters have a significant effect on Hg concentrations on soil and wetland regions that are proximate to a family recreation park.

#18 Potential Brownfields in Memphis, Tennessee: 46 Keel Avenue and 1249 Fairfax Street in the Hollywood District

Blaire O'Neal

Faculty Sponsor: Rosanna Cappellato, Department of Biology

There has been a growing interest in the assessment and redevelopment of brownfields in Memphis, TN. Brownfield sites are abandoned, underused, or vacant properties that are prevented from being redeveloped due to a high potential for environmental contamination. This study focuses on two key areas of concern: the Wolf River Harbor in Downtown Memphis and the Hollywood District in North Memphis. I investigated and compared the manufacturing and processing facility of American Snuff Company at 46 Keel Avenue in the Wolf River Harbor and an abandoned industrial facility at 1249 Fairfax Street in the Hollywood community. These sites' designation as a brownfield was determined by assessing each property and identifying its need for costly remediation. Results from a preliminary analysis suggested that the American Snuff Company has a low potential for environmental contamination, while the facility at 1249 Fairfax shows many signs of environmental contamination. Therefore, redevelopment will be a much easier pursuit at the Wolf River Harbor site, as remediation may not be a factor in the redevelopment process.

#19 The Environment as an Actor: GIS and International Relations

Camilla Taufic, Adam Alsamadisi

Faculty Sponsor: Sarah Boyle, Department of Biology

We use Geographic Information Systems (GIS) to relate environmental effects with international relations. Our first topic addresses agriculture in three African countries. The maps show changes in surface temperature and soil moisture levels-from preindustrial levels to future levels using different climate models. In Kenya, we see how attempts at eradicating pastoralization are in part because of a need for placing national parks on non-arid land. This has created economic losses and social miscommunications in the country. In Burkina Faso, lack of crop diversity enhances vulnerability to famine, which produces lack of political stability and need for assistance. Namibia, on the other hand, has used ecotourism in order to diversify its economy. Our second topic shows how rising sea levels along china's coastline will result in environmental refugees. This problem will be heightened due to the intense population density in these areas. The third topic compares the locations of nuclear facilities to fault lines and tectonic plate lines in the United States, highlighting the likelihood of disaster due to earth-quakes. Here, we see that not only developing countries are vulnerable to natural crises but that first-world countries need to be paying attention to their environmental future as well.

#20 Examination of Spring Migration and Stopover Sites using WSR-88D Radar

Jared Swenson

Faculty Sponsor: Michael Collins, Department of Biology

Radar technology is now recognized as an important tool for understanding avian ecology and influencing conservation management. Previous studies on avian migration have demonstrated that the Mississippi River is an important corridor for neotropical migrants during both spring and fall migration. In this study, historical WSR-88D radar surveillance data from the station located in Memphis, TN was used to quantify bird density at stopover sites during peak spring migration of nocturnally migrating passerines. Base reflectivity and base velocity were analyzed at 0.5° and 1.5° elevational bands in the hours following twilight to view exodus events of nocturnal migration. Areas of highest reflectivity, and thus bird density, were then characterized using GIS and LANDSAT data. The GIS map will be used in future studies to determine important characteristics of stopover sites within a 100km radius of Memphis, TN.

#21 Adding Insult to Injury: Primary and Secondary Costs of Loss in Lizards.

Landon T. LaSalle, Julia Goss, Ted Boozalis

Faculty Sponsor: Jon Davis, Department of Biology

Tail autotomy is an effective predator avoidance strategy used by lizards; yet, tail loss 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 quantified the resource costs of caudal autonomy using biochemical and morphological techniques to determine protein and lipid content of four lizard species' tails. We also 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 lizards before tail loss and at 0%, 50%, and 95% regrowth. We also tested the hypothesis that social status of males decreases following tail loss. We randomly paired 1 female with 1 male, videorecorded 5 minute behavioral trials, and analyzed the videos to score the females' spatial proximity and social behaviors towards males with intact or removed tails. Results of this study indicate a significant loss of mass, protein, and lipid, and an overall decrease in activity following caudal autotomy.

#22 Using Two-hybrid to Characterize Potential Atfh5 Binding Domains

Rina Ishii

Faculty Sponsor: Jonathan Fitz Gerald, Department of Biology

Throughout eukaryotes, formin proteins organize actin filaments involved in cytokinesis and cell polarity. ARABIDOPSIS FORMIN HOMOLOGUE 5 (AtFH5) is an Arabidopsis thaliana formin found in the posterior pole of the endosperm. Unlike the formins found in other organisms, plant formins are transmembrane proteins. Little is known about the additional proteins required to position and activate plant formins via these internal and external protein domains. Previous genetic studies suggest that the plant GTPase RHO OF PLANTS 2 (ROP2) is important for localizing Atfh5 to its proper cellular position. We have also found that Fascyclin-like Arabinogalactan protein 12 (Fla12), an uncharacterized protein, is a potential binding partner. By using yeast two-hybrid assays, we will attempt to dissect the regions of Atfh5 required for Fla12 binding and determine if there is a physical interaction between Atfh5 and Rop2. Our model is that the arabinogalactan proteins, which are typically extracellular, will bind to Atfh5 domains outside of the cell whereas the cellular protein Rop2 will bind Atfh5 within the cell. This would produce a formin that could process both external and internal signals for directed polarized growth.

#23 Myosin is Necessary for Cell Division in Fungi

Xiao Wang, Wenbin Du, Brianna Hoge, Loretta Jackson-Hayes, Darlene Loprete

Faculty Sponsor: Terry Hill, Department of Biology

Cell division (cytokinesis) proceeds by a variety of mechanisms, depending upon the evolutionary group under study. In fungi, cytokinesis involves the progressive inward growth of the plasma membrane and the cell wall, resulting in a series of connected multinucleate compartments separated by crosswalls termed septa. The process of septation, despite intensive study, is still incompletely understood. What is clear, however, is that the process is complex, involving a wide variety of proteins acting in concert. After chemical mutagenesis of the model research organism *Aspergillus nidulans*, we identified a variety of strains exhibiting impaired septum formation. Here we report that the gene mutation in one of these strains (RCH-2) involves a base substitution in the fungal homologue of

the mammalian myosin II protein (MyoB), a protein that in other systems acts in concert with the protein actin to generate motion of cells and cell components. We have demonstrative via fluorescence microscopy of GFP-tagged MyoB that MyoB localizes to sites of septation in wild type (non-mutant) cells of *A. nidulans*, and we have shown via promoter replacement that global down-regulation of MyoB represses septation. These data support a hypothesis that MyoB plays a necessary role in normal septation in fungi.

#24 The role of Myosin regulatory light chain in fungal cell division

Michael Pluta, Kristen Wendt, Loretta Jackson-Hayes, Darlene Loprete

Faculty Sponsor: Terry Hill, Department of Biology

Using genetically engineered fluorescent homologues, we have demonstrated that the cytoskeletal protein Myosin Regulatory Light Chain (MrlC) localizes to sites of cell division (septum formation) in the filamentous fungus *Aspergillus nidulans*. MrlC in other systems has been demonstrated to form a complex with the motor protein myosin and to regulate myosin's interactions with actin, which can result in motion of whole cells or cell components. Since septum formation can be viewed as a special form of motility in which the cell surface is progressively pinched inward until the cell divides, the localization of MrlC to septation sites supports a hypothesis that it plays some role in regulating cell division in the filamentous fungi. To further investigate this hypothesis, we have engineered a chimeric DNA molecule which, in principle, should be able to cause the deletion of MrlC from the genome of *A. nidulans*. Contrary to expectations, the cells resulting from this procedure (termed transformants) are still able to form septa under all conditions so far tested. Thus, MrlC's role in septation must be viewed as one of fine-tuning of the process (e.g., regulation of timing or site selection) rather than as a component necessary for completion of the process.

#25 Novel Cancer Drug Exhibits Cardioprotective Activity During Ischemia

Nicholas Brydon; Katherine Lothstein; Len Lothstein, University of Tennessee; Polly Hoffman, University of Tennessee; Judith Soberman, University of Tennessee

Faculty Sponsor: Gary Lindquenter, Department of Biology

Myocardium is subject to irreversible injury during ischemia, and additional damage during reperfusion due to circulation of free radicals. The ability to establish cardioprotection during ischemia would not only modify the acute effects of ischemia, but also cell death associated with reperfusion. N-Benzyladriamycin-14-valerate (AD 198) is a novel anthracycline protein kinase C (PKC)-activating agent. AD 198 is cardioprotective against ischemia-reperfusion damage when rodent hearts are perfused with AD 198 prior to ischemia with >80% recovery of function. We hypothesized that AD 198 would reduce ventricular damage when administered during acute ischemia and at immediate reperfusion. Excised rat hearts were cannulated and mounted on the Langendorff apparatus then perfused with Krebs-Henseleit buffer. Left ventricular developed pressure (LVDP) was measured throughout the experiment using a pressure transducer inserted into the left ventricle. AD 198 was infused at the onset of ischemia, or at varied time points into the ischemic period. Ischemia was maintained for at least 15 minutes followed by reperfusion for 60 min. Post-ischemic LVDP was measured during reperfusion to assess Cardioprotection from reperfusion injury. Control hearts employed similar protocols without drug infusion. Preliminary Results suggest that AD198 appears to confer some early cardioprotection from ischemia-reperfusion compared to controls.

#26 HIF-1 α Regulation of Biomarkers that may be Critical in Regulating Breast Cancer Progression and Metastasis

Sandy Henin; Tiffany Seagroves, Department of Pathology, University of Tennessee Health Science Center

Faculty Sponsor: Gary Lindquenter, Department of Biology

As a master regulator of the hypoxic response, the transcription factor Hypoxia-Inducible Factor (HIF)-1 plays an important role in mediating tumorigenesis. HIF-1 regulates multiple genes that impact cell cycles, cell migration and adhesion, glycolytic metabolism, multidrug resistance and angiogenesis. By targeting therapies to the subset of genes downstream of HIF-1 α ; that are highly implicated in the progression of tumors or metastasis, it may be possible to increase patient survival. The presence of a rare sub-population of tumor-initiating cells (TICs, or cancer stem cells CSCs) is proposed to be responsible for cancer recurrence and therapeutic resistance. Therefore, understanding how HIF-1 α ; regulates TICs may lead to development of improved therapeutic strategies. We will compare the expression of known CSC markers in HIF-1 WT vs. KO mammary tumor cells developed in the

Seagroves laboratory from a mouse model of breast cancer. Marker expression will be compared by immunostaining of monolayer cultured WT vs. KO cells (bulk tumor cells) and WT vs. KO tumorspheres, which are enriched for the CSC population. It is expected WT cells/spheres will be enriched for the expression of CSC markers when compared to the KO cells/spheres. Expression of CD24 (heat stable antigen), CD29 (Integrin β 1), CD49f (Integrin α 6), and CD133 (Prominin-1) will be examined. In addition, a subset of novel HIF-1-dependent genes, including creatine kinase b (Ckb) and embigin (Emb), will be evaluated in both WT and KO cultured cells and mammary tumors.

#27 Pre-clinical Testing of the Novel Anthracycline AD445 in Human Breast Cancer Cell Lines

Bethany Larkin; Tiffany Seagroves, Len Lothstien, Department of Pathology, University of Tennessee Health Science Center

Faculty Sponsor: Gary Lindquester, Department of Biology

A modified anthracycline-based chemotherapy (AD445) was developed to circumnavigate problems of cardiotoxicity, multi-drug resistance, and cancer relapse presented by use of doxorubicin (DOX). Initial research by Dr. Lothstein shows a promising future for the use of AD445; however, no extensive studies have been conducted in human breast cancer cells to compare AD445 to DOX. This study looks at the anticancer activity of the two drugs in MB-MDA-231 and SUM 159 cell lines. MTT assays indicated similar IC₅₀ /IC₉₀ doses for the drugs in both cell lines. Cancer stem cells (CSCs) are believed to be a small subpopulation of tumor cells resistant to chemotherapies, including DOX. To test if AD445 preferentially eradicates breast CSCs, tumorsphere formation assays and ALDEFUOR sorting assays were used. The tumorsphere assay demonstrated that AD445 is slightly more efficient at inhibiting growth of MB-MDA-231 spheres than DOX. Currently, the ALDEFUOR assay is used to sort cells into CSC and tumor bulk cell subpopulations. The efficiency of tumorsphere formation will then be compared with the effect of each drug on the sorted populations. AD445, circumnavigating multi-drug resistance, and being lipophilic and cardioprotective, has a promising future for treatment, particularly if AD445 preferentially kills CSC sub-populations in breast cancer.

#28 Invasion of the Blood Cell Snatchers: A Study of Snake Hemoparasitism in an Urban Park

Adiha Khan, Matt Grisham, Anna Johnson, Matt McCravy, Alex Yu, Kimber Jones

Faculty Sponsor: Laura Luque de Johnson, Sarah Boyle, and Jon Davis, Department of Biology

Parasitism is a successful life strategy found throughout every ecosystem. In many instances, the success of a parasite not only depends on its host or vector, but on the environment itself. Our project focuses on snake parasitism in an urban environment (Overton Park, Memphis, TN). Blood samples of 34 snakes, representing 5 different species, were collected and analyzed by histology to identify hemoparasites. To characterize the parasite genus and species, the Hepatozoon hemoparasite 18S ribosomal RNA gene and the Plasmodium hemoparasite mitochondrial cytochrome B gene were amplified using polymerase chain reaction (PCR). PCR products were then sent for sequencing and a BLAST search was performed to identify the genus and/or species of the hemoparasite. Mosquitoes, ticks, and mites were also tested for these genes to identify potential vectors for these hemoparasites. Through hemoparasite molecular analysis in both snake blood and vector samples, we are working towards discovering potential correlations between parasites, their hosts, and the environment.

#29 Mutational analysis of Plasmodium falciparum Erythrocyte binding protein 175 (EBA-175)

Christopher Perkins, Shannon Fuller

Faculty Sponsor: Laura Luque de Johnson, Department of Biology

Malaria is a human disease that kills one million people every year and half of the world's population is at risk of contracting the disease. Plasmodium spp. is the causal agent of malaria and while in the human host it will invade red blood cells (RBCs). To characterize the interactions between RBCs and the parasite, we use Erythrocyte Binding Antigen-175 (EBA-175), a sialic-acid dependent protein found on the surface of the P. falciparum. EBA-175 binds to glycophorin A (GpA), a major protein on the surface of the RBCs. Recent structural studies suggest that EBA-175 binds GpA via crucial interactions between the region II (RII) of EBA-175 and the sialic moieties of GpA. To further understand this interaction, we expressed and purified wild-type EBA-175 and mutant EBA-175(R422E).

The mutation at arginine 422 to glutamic acid is believed to interfere with the binding of EBA-175 to the sialic moieties of GpA. The recombinant proteins were used in a binding assay with RBCs and in a functional assay to characterize changes in the phosphorylation state of RBCs cytoskeletal proteins. Understanding the interactions of RBCs with EBA-175 will suggest how the plasmodium parasite invades red blood cells and identify potential targets for drug therapy.

#30 In Vitro Characterization of a Paclitaxel Eluting Fibrin Biomatrix for Local Treatment of Skeletal Metastases

Blake Copeland, Kelly Zhang, Rhodes College; Michelle Mary, St. Jude Children's Research Hospital; Robert Heck, Campbell Clinic; David Komatsu, Department of Orthopedics, Stony Brook University

Faculty Sponsor: Ann Viano, Department of Physics

Over 1.3 million cases of carcinoma are diagnosed yearly in the US with a 50-80% incidence of skeletal metastases. Improvements in cancer treatment have increased longevity, which has increased the need for effective management of metastases. As metastases can result in intractable pain and pathologic fractures, proper palliative care is vital to control pain and maintain function. The current standard of care for symptomatic bone metastases is a 2-week course of radiation, along with surgical implantation of orthopaedic hardware if there is risk for “impending pathologic fracture.” Radiation and surgery involve significant financial and time burdens due to the need to travel to regional cancer centers for treatment. The development of alternatives to radiation that could be given in a single dose at outpatient clinics would therefore represent a major advance in palliative care. We have developed a novel formulation of the commonly used chemotherapeutic agent, paclitaxel (PTX), to meet this need. This formulation is a radiopaque, injectable fibrin biomatrix designed for the controlled release of therapeutic doses of paclitaxel at local skeletal sites. This study presents data demonstrating the release profile and bioactivity of PTX from this biomatrix.

#31 Quantum Chemical Calculations of the Interaction Energies of Benzene and Borazine Molecules in Complex and With Solvents and Proteins: The Role of Boronated Molecules in Cancer Treatment

Elizabeth Jeans

Faculty Sponsor: Mauricio Cafiero, Department of Chemistry

In order to study possible pharmacological applications of ring-ring interactions between boronated molecules, we optimized all possible t-shaped and sandwich complexes between benzene and naphthalene and their boronated analogues using MP2 and HCTH. Counterpoise-corrected interaction energies of all complexes were calculated using MP2, MP4, QCISD, CCSD(T), B3LYP, SVWN, and TPSS with the 6-31+g* and 6-311+g* basis sets. Correlation consistent basis sets were used to extrapolate large-set-limit CCSD(T) interaction energies. Results showed mixed pairs of boronated and non-boronated molecules, in both sandwich and t-shaped interactions, had the strongest interactions; pure non-boronated sandwich and t-shaped complexes have the weakest interactions. Boronated molecules are used in Boron Neutron Capture Therapy (BNCT), a method for treating cancer. In BNCT, boronated molecules show preferential uptake into cells. Towards understanding this behavior, simple solvation models of benzene and borazine with water and octonal (representing cell plasma and membranes) were studied. Preliminary results indicated borazine's affinity for binding to octonal over water, potentially explaining its physiological transport properties. In addition, we present preliminary calculations on the interaction energies of boronated molecules with small peptide molecules to better understand the behavior of boronated molecule/protein interactions.

#32 Identification of the PkcA Septation Site Localization Signal

Claire DelBove, Ryan Costello, Terry Hill, Darlene Loprete

Faculty Sponsor: Loretta Jackson-Hayes, Department of Chemistry

Protein kinase C phosphorylates proteins involved in various cellular processes, particularly signal transduction. In the filamentous fungus *Aspergillus nidulans*, PkcA is involved in cell wall metabolism, evident in the sensitivity of a strain carrying a mutation in the *pkcA* gene to calcofluor white, a cell wall perturbing agent. PkcA localizes to hyphal tips and septation sites, areas of cell wall growth. However, the role of PkcA in septation is not well understood. Determining the localization signal will help to illuminate PkcA's role in septation. PkcA contains four

functional domains. Here, we constructed C-terminal truncations of PkcA that successively removed each domain or sub-domain. Each of these truncations was expressed as a GFP chimera. We determined which domains of the protein were sufficient for localization by observing the transformed colonies under a fluorescence microscope.

#33 Stratigraphic Analysis of Lead in Soil

Erik Campbell, Punam Patel, Reed Beazley

Faculty Sponsor: Jon Russ, Department of Chemistry

Most urban environments have elevated concentrations of lead (Pb) in the soils. Past studies focusing on the analysis of lead have differed in the sampling strategy, with one aspect being the depth (and strata) collected for the analysis. This could cause there to be a discrepancy in the results. Through the use of stratigraphy analysis, we separated our soil samples by strata to determine which layer contained the greatest concentration of lead. Using this information, future studies can be conducted to obtain a more accurate reading of where the lead occurs within the soil profile. Soil samples were collected and stratified at one inch intervals to determine lead concentration at different depths. The soil samples were dried in a 100°C oven, ground using a mortar and pestles, and sieved through a 2mm then 250µm sieve. The powdered soil samples were then placed in Chemplex XRF containers with Mylar windows, then analyzed using X-Ray Fluorescence Spectroscopy (XRF). Preliminary investigations into the stratigraphy show that most of the lead concentration is found within the first two centimeters of soil, although additional samples need to be analyzed to establish the relationship between depth and lead concentration.

#34 Analyses of soil Lead levels at Memphis City Schools using XRF and ICP-OES

Marshall Friskics-Warren, Erik Campbell, Yuri Brodskiy

Faculty Sponsor: Jon Russ, Department of Chemistry

Lead in soils is a main suspected source of elevated blood lead levels (BLL) in children from urban environments. BLLs greater than 10µg/dL are considered problematic as cognitive development issues can arise. We are reporting here the soil Pb concentrations from common areas for Memphis children, specifically soils from play areas and entrances at schools. Soil was collected and analyzed from 80 Memphis City schools using primarily X-Ray Fluorescence Spectroscopy (XRF) and results were verified by analyzing a subset of samples using Inductively Coupled Plasma- Optical Emission Spectroscopy (ICP-OES). To prepare for the XRF analysis soil samples were dried in a 100°C oven, ground using mortar and pestles, and sieved through a 2mm then 250µm sieve. A plastic Chemplex XRF analysis container with a Mylar window was filled with sieved soil and analyzed, for 30s on soil mode. Aliquots of nine soil samples were also analyzed using the ICP-OES following EPA method 6010 for the sample preparation. The results show that soils lead levels at Memphis City Schools are well below the EPA allowance of 400 ppm in most play areas. The Pb distribution was mapped using the interpolation method Kriging which showed that the soil lead levels are highest at schools close to the downtown area and are lower at schools in the east.

Neuroscience

#35 Differential Temporal Upregulation of Bax Expression in Response to Chronic Restraint Stress and Exercise in the Mouse Hippocampus and Cortex

Anna Kolobova, Sarah Allen

Faculty Sponsor: Kim Gerecke, Department of Psychology

Chronic restraint stress causes deleterious effects on the hippocampus through chronic elevation of glucocorticoids (GCs). Excess levels of GCs leave neurons vulnerable to other toxic insults such as oxidative stress and inflammation, a process that has been implicated in all neurodegenerative events. Exercise has been shown to protect against the harmful effects of oxidative stress, inflammation, and the chronic elevation of GCs, thus, we investigated the neuroprotective effects of exercise in a model of chronic stress. In the current study, mice were divided into two housing groups: standard housing and exercise. Half of the animals in each housing condition were stressed for 2 hours per day for 14 consecutive days. To determine temporal expression, animals were sacrificed 1 and 24 hours after the final stress and tissue was harvested for Western Blot (WB) analysis. The data suggests that stress upregulates Bax, and exercise downregulates the expression of this factor in the mouse cortex at 1 hour following the last stress, and that this expression attenuates after 24 hours. Bax expression remained unchanged in

the hippocampus. This suggests that chronic stress induces apoptosis in the cortex and that exercise can decrease neurodegeneration in this region.

#36 Localization of Vasotocinergic and Dopaminergic Target Sites Involved in Regulating Social Behavior in the Brown Anole lizard, *Anolis sagrei*

Jason Ballard, Leah Singh, Veronica Alix

Faculty Sponsor: David Kabelik, Department of Biology

Dopamine and arginine vasotocin are neurotransmitters/ neuromodulators that are involved in the regulation of social and motivational behaviors, specifically behaviors involved in courtship and aggression. Studies have shown that different social contexts cause differential activation of various vasotocinergic and dopaminergic cell groups, and thereby also likely differential activation of their receptors. Further localization of source and target cell groups and more extensive mapping of the neural circuitry associated with these regions are required to better understand the functional connectivity modulating such behavior. The goal of this study is to identify vasotocinergic and dopaminergic source and target cell groups, concentrating on the lateral septum (LS), a subpart of the limbic system. We conducted these studies using the Brown Anole lizard (*Anolis sagrei*), due to its territorial nature and easily characterizable repertoire of aggressive and reproductive behaviors. Using immunocytochemistry, we localized Fos expression, indicating activation of neurons, to identify regions of the LS activated during aggression and courtship behavioral trials. Additionally, we are cannulating the LS and using neural track tracers to identify regions innervated by these septal cell groups. The results will help us to characterize the neural network regulating these social behaviors.

#37 Vasotonergic Modulation of Aggression in the Brown Anole Lizard (*Anolis sagrei*)

Salar Rafieetary, Aaron Kala, Will Hawes

Faculty Sponsor: David Kabelik, Department of Biology

Arginine vasotocin is a peptide neuromodulator that is thought to influence social behaviors amongst various vertebrate species through a neural mechanism that has been relatively conserved throughout its evolutionary context. Studies involving arginine vasotocin manipulations in various species have shown that this neuropeptide is linked to the regulation of various social behaviors. Studies in song birds have shown that vasotocin can play different roles in modulating aggressive behaviors depending on the social context of the observed animal (Goodson & Kabelik, 2009). Thus, arginine vasotocin not only regulates aggression, but it does so according to particular social situations. Our goal is to study the role of arginine vasotocin in aggression modulation in brown anole lizards (*Anolis sagrei*) in order to better identify the core circuitry of social behaviors. We chose the brown anole because it is a territorial lizard that tends to defend its perch using aggressive displays and behaviors (Tokarz 1985). By administering vasotocin or an antagonist through brain cannulae, we directly measure differences in the peptide's effects on territorial aggression. By performing Immunocytochemistry on brain sections, cFOS expression, denoting vasopressin activation, can be observed to localize the neural vasopressin populations involved in modulating aggression.

#38 N1 Response Attenuation to Repeated Stimuli in Subjects With and Without ADHD

Kristin L. Knopf, Marie R. Kyle, Lauren T. Schully, Megan M. Brooks, Kelly H. Parry, Ivy A.

Thompson, Elise B. Suna, Rachel Stowe, Komal Mehra, Julia A. Golizio, Laura A. Flink,

Rebecca E. Diamond

Faculty Sponsor: Jeffrey Sable, Department of Psychology

The main objective of our study was to compare brain responses to repetitive sounds between people with and without ADHD. Specifically, we utilized event-related potentials (ERPs), which are brain responses to auditory stimuli. We were interested in the N1 response, which is one of the brain's initial responses to a sound. In healthy brains, the N1 attenuates with rapid repetitions of the same sound. We believe this process is altered in people with ADHD, causing their N1 responses to stay elevated. Our hypothesis was based on previous research, which examined N1 attenuation to repeated sounds in younger and older adults (who also show attentional difficulties). The experimental manipulation assessed N1 differences between ADHD and control subjects. Forty students, including 20 diagnosed with ADHD and 20 controls, participated in the study. Subjects heard tone trains while viewing a TV sitcom with closed captioning, and N1 attenuation during the trains was measured through scalp electrodes. It was predicted that students with ADHD would have less N1 attenuation than the control group to

repeated sounds (i.e., the N1 would remain relatively large to the repeated sounds), because ADHD alters the brain's ability to filter repeated, unnecessary stimuli.

#39 Is Perceptual Experience Altered with ADHD and Does It Correlate with N1 Attenuation?

Marie R. Kyle, Kristin L. Knopf, Lauren T. Schully, Megan M. Brooks, Kelly H. Parry, Rebecca E. Diamond, Laura A. Flink, Julia Golizio, Komal Mehra, Rachel Stowe, Elise Suna, Ivy A. Thompson

Faculty Sponsor: Jeffrey Sable, Department of Psychology

The present study compared brain responses to repetitive sounds between people with and without ADHD. This study used event-related potentials (ERPs), which are measured brain responses to sounds. We were especially interested in the N1 response, which is one of the brain's initial responses to a sound. In healthy brains, the N1 attenuates with rapid repetitions of the same sound. We believe this process is altered in people with ADHD, causing their N1 responses to stay elevated. Electrodes were used to measure subjects' N1 brain responses to sound trains while watching a TV sitcom with closed captioning. Upon arrival, subjects were given a 17-item questionnaire (Kisley, Noecker & Guinther, 2004) that assessed self-reports of perceptual experience, adapted from the Sensory Gating Inventory (SGI) developed by Hetrick, Erickson, & Smith (2010). We analyzed differences on the SGI items between ADHD and control participants. It was predicted that subjects with ADHD would indicate greater distractibility than control subjects. In addition, correlations between SGI and N1 attenuation were computed. It was predicted that there would be a negative correlation, such that higher distractibility reports on the SGI correlate with less N1 attenuation to repeated stimuli.

#40 N400: Can We Give Intelligence Tests by Reading your Mind?

Perry Person, Evan Savage, Madeline R. Scott, Anna Kolobova, Eleanora Puetz, Alyssa Nucaro

Faculty Sponsor: Jeffrey Sable, Department of Psychology

The underlying assumption to multiple choice questions on standardized tests is that relatively more proficient individuals will be able to use context to determine the most appropriate answer from a list of options. In fact, a brain response occurs between 300 and 400 ms after the presentation of a semantically incongruent word within a sentence (Kutas & Hillyard, 1980). This response is commonly referred to as the N400. Further research into the nature the N400 has shown that it responds to any violation of semantics associated with a verbal or written sentence (i.e., a picture of a duck paired with a sentence describing the actions of a dog) (Hirschfeld, Zwitserlood, and Dobel, 2010). Success in eliciting the N400 in response to violations in number sequence have led to the theory that the N400 is does not depend only on language (Fogelson et al., 2004). We are testing this theory by measuring the N400 response to a series of congruent and incongruent symbol patterns and comparing those responses with a measure of the N400 in response to semantic expectancy violations. We expect that the N400 will not differ significantly between the two conditions.

Physics and Mathematics & Computer Science

#41 Charging a Sphere through Contact with a Charged Sphere

Joe Svejkosky, Brent Hoffmeister, Charles Badger

Faculty Sponsor: Shubho Banerjee, Department of Physics

For sophisticated experiments it is useful to know the exact amount of charge that is deposited from a conducting "source" sphere onto a conducting "recipient" sphere if they are brought into contact. This study reports a theoretical model developed to predict the surface voltage of a conducting sphere charged by a second sphere. Models were developed for two cases of charging. In the first case the source sphere is held at a fixed voltage. In the second case the voltage of the source sphere is allowed to drop due to the distribution of charge over both spheres. In both cases the voltage of the charged sphere is calculated as a function of the charging voltage and the size ratio of the two spheres. Theoretical predictions are verified experimentally using conducting spheres of various sizes and a Faraday ice pail apparatus.



#42 Testing the Large-area multi-Institutional Scintillator Array (LISA) Neutron Detector

Nick Badger, Matthew Miller, Rhodes College; Kaitlynn Rethman, Kim Purtell, Autumn Haagsma, Central Michigan University; Casey DeRoo, Megan Jacobsen, Concordia College; Alexander Peters, Gettysburg College; Tim Nagi, Hope College; Sam Stewart, Zach Torstrick, Mathieu Ndong, Indiana University South Bend; Rob Anthony, Hengzhi Chen, Alex Howe, Steve Kuhn, Ohio Wesleyan University; Brad Vest, Ben Foster, Logan Rice, Wabash College; Alegra Aulie, Amanda Grovom, Philip Kasavan, Lewis Elliott, Westmont College

Faculty Sponsor: Deseree Meyer, Department of Physics

We constructed and tested modules for the Large-area multi-Institutional Scintillator Array (LISA). Testing LISA included ensuring the detectors are light-tight, measuring the gain of each phototube, measuring the energies of cosmic rays, and measuring the gamma ray attenuation through the scintillating plastic of each module. LISA will be combined with MoNA, the Modular Neutron Array (MoNA), and will be situated at the National Superconducting Cyclotron Laboratory (NSCL). MoNA LISA will be used to detect neutrons from nuclear decays to help us better understand synthetic nuclei with large numbers of neutrons.



#43 The Construction of LISA

Matthew Miller, Nick Badger

Faculty Sponsor: Deseree Meyer, Department of Physics

We constructed modules for the Large-area multi-Institutional Scintillator Array (LISA). During the construction we assembled high voltage dividers, which provide power to the photomultiplier tubes and allow for computer interface. Two of the photomultiplier tubes attached to high voltage dividers were then optically coupled to each scintillator bar. LISA will be combined with MoNA, the Modular Neutron Array (MoNA), and will be situated at the National Superconducting Cyclotron Laboratory (NSCL). MoNA LISA will be used to detect neutrons from nuclear decays to help us better understand synthetic nuclei with large numbers of neutrons.

#44 Molecular Hydrogen in the Galactic Wind of M82

Joshua Fuchs

Faculty Sponsor: David Rupke, Department of Physics

A more complete understanding of the multiphase nature of galactic winds is necessary to constrain the dominant carriers of mass and energy. Recent studies of near-infrared lines of molecular hydrogen in the galactic wind of M82 have revealed that the warm H₂ is extended more than 3 kpc from the nucleus of the galaxy. This project used Gemini NIR spectroscopy to study the velocity structure of the warm molecular hydrogen, which in turn provides information on the dynamical importance of this newly-discovered, extended phase. We also present near-infrared shock diagnostics of the M82 wind. This work was conducted by a Research Experience for Undergraduates (REU) position at the University of Hawai'i's Institute for Astronomy and funded by the NSF.

#45 Random Generation of 3-D Buildings

Nicholas Volgas, Jonathan Mervine, Daniel Smith

Faculty Sponsor: Eric Breck, Department of Mathematics & Computer Science

For our project we designed a program that generates a 3-dimensional building via random generation. That is, given an initial length and width, our program generates a building from it. Through the use of random generation, the program will create a unique building every time that has absolutely no pre-defined structure to it. Once a 2-d version of the building has been created it is modeled using 3-d rendering software called Vizard. The final program will establish a start room where the user is placed and an end room to which the user must find, somewhat like a maze. There will be a path from the start to finish, but there will also be other misleading paths to make the game difficult. To find these paths we are implementing a minimum spanning tree algorithm to make sure that there is a path from start to finish and then randomly adding branching paths for difficulty. Once this is finished, other obstacles will be implemented such as locked doors, puzzles, etc.



St. Jude Summer Plus Fellowship

#46 MicroRNA Alteration of Transcriptional Activity by Gene Promoter Interaction

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Faculty Sponsor: Gary Lindquister, Department of Biology

In recent years, microRNAs (miRNAs) have been characterized as important gene regulators. Extensive research has been conducted examining the role of these RNA molecules in degrading transcribed messenger RNAs (mRNAs) and otherwise preventing the translation of viable protein. Recent research suggests that, in addition to interfering with translation and degrading mRNAs, miRNAs may also play an alternative role in up-regulating mRNA transcription levels. Two broad categories by which miRNAs down-regulate gene efficiency have been characterized: direct and indirect. MicroRNAs can either directly interact with mRNAs to down-regulate them, or they can act upon co-factors that, in turn, down regulate the efficiency of translation. MicroRNAs have also been shown to indirectly up-regulate gene efficiency by acting on cofactors that would typically act in a suppressive manner. What has not been characterized is a direct mechanism by which miRNAs up-regulate gene efficiency. This study is designed to test the hypothesis that miRNAs directly interact with gene promoter regions to up-regulate transcription. To test this, three main factors were computationally examined across the entire human genome: correlations between all miRNAs and all mRNAs across patient samples, complementarity between miRNAs and potential miRNA binding sites in gene promoters, and the minimum free energy of binding between miRNAs and their potential binding sites in gene promoters. The miRanda algorithm was used to calculate complementarity and minimum free energy in miRNA/gene promoter region interactions. In the obtained results, interactions of interest are characterized by a combination of: low minimum free energy in target site binding, high complementarity in target site binding, and a positive, significant correlation between the particular miRNA and the particular mRNA associated with the relevant gene promoter. These characterized points of interest can then be further examined through in vitro experiments.

#47 The addition of Regulatory T cells in Umbilical Cord Blood Transplant Enhances the Rate of Engraftment and Pathology of Immune Reconstitution

Colleen Parrish; Deanna Langfitt, Mari Dallas, Department of Oncology: Bone Marrow Transplant and Cellular Therapy, St. Jude Children's Research Hospital

Faculty Sponsor: Darlene Loprete, Department of Chemistry

Delayed immune recovery is a major complication after hematopoietic stem cell transplantation (HSCT) and is particularly significant in patients undergoing umbilical cord blood transplantation. The rate of engraftment and immune reconstitution has been shown to be related to the number of hematopoietic stem cells (HSC) in the graft. Compared to other HSC sources such as bone marrow or peripheral blood HSC, umbilical cord blood has significantly lower numbers of HSC. Immune reconstitution after HCT is dependent upon thymic recovery; continual importation of thymic progenitors is required for thymic function. After transplantation, engraftment of the donor thymic progenitors is necessary for thymic recovery and generation of a new immune system. Understanding the mechanism of thymic recovery after HCT may provide insight into methods to improve immune recovery after UCBT. The biology of thymic recovery after HSCT has not been well established. Our lab is looking at the effects of facilitator cells outside of the normal thymic progenitors, in particular regulatory T-cells, and their role in the facilitation of immune recovery as seen through stem cell engraftment and the recovery of the thymus. Specifically, we examined the thymus through analysis of pathology in conjunction with the pathology department, and flow cytometry.

#48 Application of Asparaginase Activity Assay to Clinical Pharmacokinetics of Asparaginase in Children with Acute Lymphoblastic Leukemia

Allie Elozory; Jean Cai, Christian Fernandez, Chengcheng Liu, Mary Relling, Department of Pharmaceutical Sciences, St. Jude Children's Research Hospital

Faculty Sponsor: Mary Miller, Department of Biology

Asparaginase is an antineoplastic agent used in combination therapy to treat acute lymphoblastic leukemia (ALL). In a front-line ALL trial, patients are randomized to receive standard (2500 IU/m²) vs high (3500 IU/m²) doses of pegylated asparaginase. One aim is to compare the serum concentrations of asparaginase between the dose levels. An assay was established to estimate activity level of asparaginase in serum collected from children who have received asparaginase. Activity was measured by an enzymatically-coupled oxidation of reduced nicotinamide adenine dinucleotide (NADH), monitored by UV spectrophotometry using L-asparaginase stock solution and bovine-serum albumin to create calibrators. Linearity was established from 0 to 2.2U/mL (R²=0.998, p=2.3x10⁻¹⁰). The disappearance of NADH, shown by a decrease in absorbance at 340 nm when plotted versus change in mOD/minute, was directly proportional to the activity of asparaginase. The reportable range was from 0.011 U/mL to 2.2 U/mL analytically, and then extended from 2.2U/mL to 4.0U/mL for the clinically reportable range. Inter-assay precision was established (low control CV%=6.38%, high=5.22%), as was intra-assay precision (low control CV%=3.10%, high=2.70%). This assay procedure is currently being used for assessing systemic exposure of asparaginase for serum samples from patients with ALL at St. Jude Children's Research Hospital.

#49 Radiation Treatment for Medulloblastoma Survivors Disrupts Normal Reading

Development

Evan Savage; Robert Ogg, Department of Radiological Sciences, St. Jude Children's Research Hospital

Faculty Sponsor: Jeffrey Sable, Department of Psychology

We examined the relationship between acquired reading deficits and therapy-induced brain injury in the extrastriate visual areas of the occipital and temporal lobes of medulloblastoma survivors. Based on the previous findings of Turkeltaub et al. (2003), we expected to find differences in survivors compared to controls in regard to the progressive disengagement of the right inferotemporal cortex and engagement of the left inferotemporal cortex that occurs during normal language development. Based upon these previous findings, we expected to find differences in the progression of language acquisition and performance in medulloblastoma survivors compared to control subjects, as reflected in an implicit reading task. The task involved presenting a series of words and false-font strings. Participants were to indicate whether or not each stimulus contained an ascender (l, f, or t); afterwards subjects were given a post-test, requiring them to recall the words and false-fonts presented. Though a full statistical analysis has yet to be performed, our preliminary results match nicely with the prior findings in non-medulloblastoma subjects scores on the implicit reading task and our results for the patient group offer the tantalizing suggestion that development has occurred differently in patients.

#50 Poor Fitness among Childhood Brain Tumor Survivors

Lan Tran; Webb A Smith, Robyn E Karlage, Kristen K Ness, Department of Epidemiology and Cancer Control, St. Jude Children's Research Hospital

Faculty Sponsor: Robert Strandburg, Department of Psychology

The purpose of this study was to evaluate fitness in survivors of childhood brain tumors (BT), and determine if specific physical impairments contributed to poor fitness. Participants were survivors of childhood BT, >18 years of age and 10+ years from diagnosis. We measured fitness with the six minute walk test, balance with computerized dynamic posturography, strength with isokinetic dynamometry, and peripheral neuropathy with the modified total neuropathy score. Those who scored in the lowest 10th percentile when compared to population norms were classified as having poor fitness and are reported as percentages. General linear regression, adjusted for age, gender, height and weight were used to evaluate associations between weakness, impaired balance, neuropathy and poor fitness. Among 124 survivors of childhood BT (mean age 27±5 years, 57% male), 73% had poor fitness, 55% poor balance, 89% poor knee strength, 50% poor ankle strength and 11% neuropathy. Adjusted mean walk distances were less in those with quadriceps weakness (550.6±124.6 vs. 464.9±177.2 meters) and neuropathy (560.0±134.3 vs. 455.5±130.9 meters) than in those without these impairments. Intervention for lower extremity weakness may a necessary component of any fitness training for childhood BT survivors.

Social Sciences

#51 Hope VI: Shifting Toward Self-Sufficiency

Stephanie Jones, Josh McKinley, Clark Smith, Phylicia Douglas, Anne Farrar, Olivia Ryan

Faculty Sponsor: Heather Jamerson, Department of Anthropology & Sociology

Hope VI Memphis is part of a \$5 billion federally-funded program that aims to de-concentrate poverty by providing public housing residents with Housing Choice Vouchers and case management services. Memphis is currently focused on Cleaborn Homes, the second to last public housing site in the city. Cleaborn Homes consisted of 413 households with average annual earnings of \$5000. Many of the residents have lived in public housing for as few as 10 years up to an entire generation. Between October 2010 and March 2011, all of the residents (321 using Housing Choice Vouchers) were relocated to various areas of Memphis so that construction of the new development could begin. All of the residents are eligible for case management to help them adjust to their new communities and work toward self-sufficiency. Our team's goal is to evaluate the successes and challenges these residents faced during their relocation, as well as the current delivery of the case management services. Throughout our study, we have employed participant observation in both the community and the organization providing case management services, surveys and interviews with participants (residents, CSS case managers, and partner agencies), and GIS mapping. Our findings and recommendations work to improve the services provided to and overall satisfaction of the relocated residents.

#52 Hope VI: The Revitalization of a Downtown Community

Joshua K. McKinley-Smith, Phylicia Douglas, Olivia Wells, Catherine Smith, Stephanie Jones, Anne Farrar

Faculty Sponsor: Heather Jamerson, Department of Anthropology & Sociology

Hope VI is a federal housing development program funded by the United States Department of Housing Development (HUD). Its goal is to de-concentrate poverty and revitalize dilapidated neighborhoods by allocating money and resources to cities for the development of mixed income housing. In May 2010 HUD awarded \$22 million to the Memphis Housing Authority (MHA) for the redevelopment of Cleaborn Homes. Cleaborn Homes sits on a 27.35 acre block downtown including three acres of park space, a Community Center and sixty-two Barrack Style buildings with 460 living units. These will be demolished and replaced with 400 affordable and market rate housing units, landscape changes, and off site development of Alonzo Elementary School. The project will be completed in four phases over a period of five years. Using GIS technology, surveys, and field research data our evaluation team has constructed a way to systematically track the progress of the development project. Currently we have project units broken down into indicators such as percentage of progress, number of section 3 employees, housing unit type, cost, security and crime. This poster will identify the potential challenges and provide recommendations to the city for the Cleaborn Homes redevelopment effort.

#53 Deconstructing Islamophobia

Rami Abdoch

Faculty Sponsor: Thomas McGowan, Department of Anthropology & Sociology

The recent media attention on Islam and Muslims has increased significantly in the past few years. Much of this coverage illustrates the phenomenon of Islamophobia, which may be understood in terms of Said's concept of Orientalism. Islamophobia is the process of essentializing the meaning of being Muslim to binary logic and stereotypes and acting/speaking based on that meaning. Following the work of Gadamer, Islamophobia is further understood as a form of interpretive violence that is both rhetorical and physical. Malcolm X's interpretive shift from the ideological binary of black and white (established by the racist ideology of Elijah Poole) to a nonviolent understanding of both himself and the other is taken as an example of the development of interpretive competence. This case is used to demonstrate the nonviolent structure of interpretive competence and its potential for undermining essentialism and Islamophobia.

#54 Factors Influencing Nursing Student Graduation Rates

Alex Herran

Faculty Sponsor: Dee Birnbaum, Department of Economics & Business Administration

The nursing profession is projected to experience severe shortages and increasing demand over the coming years. Much of the nursing shortage is attributed to nursing schools' inability to expand enrollments because of the lack of nursing professors. The problem is compounded by nursing students who do not graduate. The purpose of this study is to learn what factors influence graduation rates. Data were collected through surveys filled out by four sequential "cohorts" of nursing students during their first semester of nursing school. To test different factors, the students were split into two groups: those who graduated and those who did not. One intriguing measure is student commitment to nursing. Former studies by Gary Blau have given rise to three types of career commitment; affective, normative and continuance. Blau's measures of commitment were altered to fit the nursing profession. Other factors tested were age, sex and having children at home. Statistical examination of the data suggests that the commitment of graduating students and non-graduating students (for all three types) is not significantly different. The same results were found for age and sex. However, statistical tests did suggest that graduation rate depends upon having children at home or not.

#55 The Possibilities of GIS as a Tool in Public Education

Carson Duffy

Faculty Sponsor: Mark Smith, Department of Education; Sarah Boyle, Department of Biology

Through my internship this semester I worked very closely with the staff at Memphis College Prep Elementary School on recruiting new students for the upcoming school year and on improving existing student services. I used Geographical Information Systems technology to implement two projects that are aimed at accomplishing the above mentioned goals. The first project mapped out the residency locations of the current students at Memphis College Prep Elementary School. I also identified the locations of many resources in these neighborhoods. This included other schools, parks, churches, libraries, bus stops, pools, and additional resources that might affect the development of youth. This map served two immediate purposes. Primarily, it shows where current students are clustered so the school can better serve them. Additionally, it gives the school an opportunity to examine the resources their students have easy access to and informed what kinds of programming they might be able to implement in an absence. The second project I conducted identified neighborhoods that possibly had residents that were compatible with the mission and goals of MCP and therefore allowed the school to better market and advertise their program to these families.

#56 Structural Earthquakes: Barriers to Migration and Their Impact on Health in Haiti

Sarah Endres

Faculty Sponsor: Bette Ackerman, Department of Psychology

Migration and health in Haiti are intrinsically linked; Haitians generally lack access to quality healthcare within Haiti, and their ability to become a patient does not ease if they migrate to the United States. I argue that there are structural factors that have limited Haiti's development, and thus have encouraged or forced Haitian migration. To investigate this issue, I conducted personal interviews with people involved in migration, health, and Haiti. My research led me to conclude that structural violence can be linked to the vast majority of Haiti's present day issues. Many human rights organizations have condemned U.S. immigration policy towards Haitians, as it is notably different from policies directed at other flows of migrants. If the United States is serious about checking the flow of Haitian immigrants, I recommend that they should redirect resources used for intercepting Haitians towards investment in development in Haitian infrastructure, education, and health care. By doing so, the United States would strengthen political ties with their neighbor while subsequently decreasing the pressure for migration as the only option for escaping poverty, poor health, and political strife.

#57 Proposed Study on the Prevalence of Disordered Eating Among Jockeys and Its Effects on Mental and Physical Health

Sarah Endres, Joseph Hiller

Faculty Sponsor: Mistie Germek, Department of Psychology

A review of current literature shows a lack of information on the impact of eating disorders and disordered eating among the population of jockeys. However, research has shown that disordered eating is a significant problem

among jockeys. Jockeys are required to meet a pre-determined weight requirement before each race, forcing many to resort to extreme measures to lose the weight needed to reach that requirement. The pressures jockeys face to be thin are unique in that they are created by the environment in which they work. Additionally, horse racing is not simply a sport, but it is a career for jockeys, adding another level of pressure to meet the weight requirements. We propose to conduct a comprehensive study to examine the prevalence of disordered eating among jockeys and its effect on mental and physical health. We plan on studying jockeys from across the United States. Jockeys will be given the Eating Attitudes Test (EAT) as well as several other measurements designed to test for a range of eating problems and their effects.

#58 Eating Disorders in Sport and the Role of the Coach

Nicole Jones, Kendra Rutherford

Faculty Sponsor: Mistie Germek, Department of Psychology

A common assumption about the leadership behaviors of sport coaches is that they greatly influence their athletes' behavior, psychological health, and emotional stability (Horn, 2002). Unfortunately, there are times when coaches have a negative impact on their athletes' well-being and can actually serve as a trigger for the development of maladaptive behaviors within their athletes. One area of psychological distress in athletes that has been linked to coaching behaviors is disordered eating. Whether the coach makes a direct comment about an athlete being "too fat" or engages in nonverbal behaviors such as grabbing an athlete's thigh or stomach and shaking their head in disgust, the impact on that athlete can be severe and result in the athlete using any means possible to lose weight (i.e., starvation, bingeing and purging, laxatives, excessive exercise). Our research proposes to explore the impact of coach leadership behaviors on female student-athletes at Division I institutions sponsored by the National Collegiate Athletic Association. Participants will be head coaches of female sport teams and female student-athletes who participate in either gymnastics, figure skating, synchronized swimming, diving, soccer, volleyball, field hockey, or softball. Coach participants will complete a brief demographic information form and the Leadership Scale for Sport. Student-athlete participants will also complete a brief demographic information form in addition to the Eating Disorder Inventory and the Body Image Assessment. The importance of this study will be addressed.

#59 A Proposal to Examine Disordered Eating and Exercise Dependence in Male Triathletes: A Longitudinal Approach

Griffin Salzer, Jesse Straus

Faculty Sponsor: Mistie Germek, Department of Psychology

Most research in the area of eating disorders in sport has focused solely on bulimia nervosa and anorexia nervosa. What has yet to be thoroughly examined in sport is the impact of exercise dependence on the development and maintenance of eating disorders in athletes. Specifically, our proposal focuses on examining the relationship between exercise dependence and eating disorders in male triathletes. Little research has been conducted on male athletes, let alone male triathletes who suffer from eating disorders and exercise dependence, so we are hopeful that the results will bridge these gaps in the literature. Participants between the ages of 30 and 45 will be recruited from an elite triathlon team from Austin, TX. The study will be longitudinal and will involve the administration of the Eating Disorder Inventory, the Body Image Disturbance Questionnaire, and the Exercise Addiction Inventory at various times throughout the duration of the 5 year study. The importance of this study will be addressed.

#60 Prevalence of Eating Disorders in Athletes of Different Race/Ethnicity

Noah Schill, Andrew Weidler

Faculty Sponsor: Mistie Germek, Department of Psychology

Research related to the etiology, prevalence and treatment of eating disorders has increased significantly over the past ten years. Of particular interest has been the examination of eating disorders in sport. Although research has increased in this area, studies have yet to explore the impact of the interactions between gender, race and sport on the development of disordered eating. The current proposal will fill this gap in the literature by exploring the relationships between disordered eating and race/ethnicity, gender and type of sport. Participants will be high school, college, and professional athletes in the United States. Participants will complete a brief demographic information form (where they will report their gender, age, race/ethnicity, sport, and level of competition), the Eating Attitudes Test – 26, and the Body Image Assessment Tool. The importance of this study will be addressed.

#61 Personal History with Cyberbullying and its Relationship to Campus Social Issues

Jenna Brownfield, Mason Asbury, Ginny Brady

Faculty Sponsor: Kathryn Russell, Department of Psychology

Cyberbullying is often defined as repeated harmful aggression using technology such as text-messaging, email, social networking sites, instant messages, chat rooms and digital pictures or videos. The purpose of this study was to examine how one's personal experience with cyberbullying (as victim, perpetrator, and bystander) affects the perception of it compared to other campus social issues (i.e. hazing, sexual assault, acceptance of diversity, etc.). We plan on surveying 60-100 students with the hopes of learning about prevalence and perceptions of cyberbullying on our campus. Since these issues are perceived as major concerns on college campuses, yet not all of them are very openly talked about or understood (like cyberbullying), we have drawn the hypothesis that participants with increased personal experience with cyberbullying will perceive it as a more serious or equally serious campus problem in comparison to the aforementioned other campus social issues. The results and implications of our survey will be discussed in terms of raising awareness of this social issue.

#62 Prevalence and Perceptions of Cyberbullying Among College Students

Natalie Darar, Brittany Erwin, Regan Humphrey

Faculty Sponsor: Kathryn Russell, Department of Psychology

Cyberbullying has been defined as "willful and repeated harm inflicted through the use of computers, cell phones, and other electronic devices" (Hinduja & Patchin, 2009, p. 5). Estimates of the prevalence of cyberbullying in adolescence vary widely from study to study. Overall, the incidence of cyberbullying appears to be increasing over time. Cyberbullying has been associated with a variety of negative effects among adolescents, including low self-esteem, increased rates of suicidal ideation, and attempts at suicide, for both victims and perpetrators (Hinduja & Patchin, 2010; Patchin & Hinduja, 2010). Adolescents appear to view cyberbullying as a serious problem, and research has indicated that they overestimate its prevalence (Smith et al., 2008). Despite increasing awareness of cyberbullying among adolescents, few studies have examined the issue among college populations. Nevertheless, preliminary research suggests that it continues to be a serious problem (MacDonald & Roberts-Pittman, 2010). Even fewer studies have examined college students' perceptions of cyberbullying. Consequently, the present study investigated the discrepancies between perceptions of cyberbullying and actual prevalence rates among college students. Given the general lack of attention paid to cyberbullying in college, we predicted that students would perceive it as less common than indicated by their personal experiences.

#63 Cyber Aggression in Video Gaming Among College Males

Shelby Kramer, Griffin Salzer

Faculty Sponsor: Kathryn Russell, Department of Psychology

Our research is about video games and the effects they have on people who play them. Of particular interest for our research are games which allow online communication between players both during and following game play. Our first research question examines if there is a significant difference between the genre of video game played (sports, war, strategy, etc.) and the amount of online player-directed aggression both experienced and perpetrated. Our second research question examines if any psychological effects caused by cyber aggression during online player interactions continues after cessation of the actual video game play. We predict that different genres of video games will elicit more aggressive behaviors, and we also believe the negative effects of cyber aggression will persist after game play. Our research will include approximately 50 male participants who will complete an online survey of gaming experiences. SPSS will be used to analyze data (ANOVA, Pearson correlations) to determine the types of reported gaming experiences and the effects the video games have on the players. We have obtained approval of the IRB committee for this research.

#64 Greek Life: Prevalence and Characteristics of Cyber Bullies

Leah Singh, Alex Crain, Leann Farha

Faculty Sponsor: Kathryn Russell, Department of Psychology

The majority of research shows that adolescents experience cyber bullying, however, little research exists that examines the experiences of college students. Past findings indicate that the majority of college students utilize the Internet for accessing information, communicating with friends and family, and downloading music. Given this information, it is only reasonable to hypothesize that cyber bullying may constitute a problem among the college

aged population. The purpose of the present study is to investigate the prevalence of cyber bullying that occurs on Rhodes Campus and more specifically, to examine cyber bullying in the context of Greek organizations. Greek life, as well as student involvement in other organizations, serves as a significant part of a student's college experience. Membership in a Greek organization allows one to belong to a collective group. From this the individual develops a sense of power and dominance. Therefore, an individual belonging to a Greek organization may be more likely to cyber bully in order to maintain the established social hierarchy within the organization. Additionally, the present study explores if leadership skills and self-esteem are factors related either to the risk of becoming a victim or aggressor of cyber bullying.

#65 "I just was not thinking of others and their feelings": Narrative Perspective-Taking and Peer Acceptance

Annika Wuerfel, Darcy Gist

Faculty Sponsor: Marsha Walton, Department of Psychology

Jerome Bruner proposed that narrative serves as the cultural tool that organizes and gives meaning to everyday experience. Previous research suggests middle childhood is a time of dramatic development for these narrative skills, which facilitates improved peer relations. Our study aimed to explore how children with varying levels of the narrative skill of perspective-taking differed in their social outcomes. Written narrative data was collected from 182 children. The children were asked to write about interpersonal experiences with their peers. Children also completed surveys with self and peer reports about various social measures. Narratives were coded for psychological mindedness by counting the number of times each child author referred to thoughts, emotions, or motives in relation to the self, other, or collective we. From these counts, we created a new variable called scope of consciousness, which reflected whether each child author practiced zero, one, two, or all three categories of psychological perspective-taking. Children who incorporated different perspectives in their narratives experienced more desirable social outcomes, including higher self worth, fewer nominations for least popular, and more nominations for most popular, giving and getting respect, and sociability leadership. We suggest that narrative abilities aid children in successful navigation of their social worlds.

#66 Do You Answer the Homophone with Your Left or Right Ear? Hemisphere Imparity in Producing Parts of Speech

Keshav Kukreja, Grace Mosley

Faculty Sponsor: Katherine White, Department of Psychology

While language is primarily dominated by the left hemisphere, recent research has shown that the right hemisphere is also involved in some aspects of language processing. However, the majority of this research has focused on our understanding of words in the context of sentences. The present research focuses on the hemispheres' roles in language production, specifically the hypothesized imparity in spelling ambiguous words. Participants heard homophones whose spelling depended on whether the noun (cell) or verb (sell) part of speech was activated. The homophones were presented to either the right or left ear, and were preceded by a noun or verb prime, or letter control that was heard in both ears. Participants were asked to type out the first spelling that came to mind and a sentence using that target word. Previous research has shown that the left hemisphere quickly activates the dominant meaning of ambiguous words, whereas the right hemisphere keeps both meanings active. Thus, we predicted greater syntactic priming (i.e., spelling the homophone that matches the prime's part of speech) for homophones presented to the right ear/left hemisphere than for homophones presented to the left ear/right hemisphere.



#67 Is It Worth the Weight? Spelling Homophones Gets Better With Age

Gregory M. Palm, Ashley M. Ladd, Rachel M. Stowe

Faculty Sponsor: Katherine White, Department of Psychology

Previous research has shown that young and older adults produce more homophone substitution errors (e.g., "blue over" instead of "blew over") on when homophones are preceded by words that share orthography (e.g., glue) or semantics (e.g., sky) with the contextually-inappropriate homophone (e.g., blue). This experiment investigated influences of a homophone's part of speech and spelling regularity on semantically-primed homophone errors. Young and older adults typed auditorily-presented sentences containing homophones preceded by a prime semantically related to the alternate or by an unrelated word. Homophones shared or differed in part of speech, and their shared phonology had a regular (more common, e.g., EW) or irregular (less common, e.g., UE) spelling. While

older adults made fewer errors overall, semantic priming increased errors for both age groups, but only when homophones shared part of speech. Independent of priming, both groups made more errors when homophones contained a regular spelling, with larger effects for young adults. These findings demonstrate age preservation in syntactic constraints on lexical selection but age differences in orthographic influences during orthographic encoding.

#68 Protesting the Norm: The Right Hemisphere's Role in Language Production

Emily Shaw, Ashley Ladd

Faculty Sponsor: Katherine White, Department of Psychology

Many studies have shown that the left hemisphere controls language, but recent research indicates that the right hemisphere is involved in some aspects of language processing. This experiment explored both the right and left hemispheres' involvement in language production by having people pronounce ambiguous words that were presented via a computer screen to each hemisphere. The targets were stress-shifting words (e.g., protest) whose pronunciation depends on the word's part of speech (PROtest is a noun and proTEST is a verb). These ambiguous words were preceded by a verb prime, noun prime, or letter control. The participants were asked to pronounce each word or letter that appeared on the screen. We expected that stress-shifting words processed in the left hemisphere would be pronounced with the part of speech (noun or verb) that is consistent with the prime's part of speech. However, words processed in the right hemisphere were less likely to show syntactic priming, as the right hemisphere has been shown to activate multiple alternatives of ambiguous words, regardless of priming. The overarching goal of our experiment is to show that the right hemisphere contributes to language production, opposing the preconceived notion that language is primarily lateralized to the left hemisphere.

Biology II Laboratory

#71 Dominant Relationships in *Orconectes virilis* Change According to Size

Anne Medved, Ellen Dahl, Rachael Ward, Jessica Wang

Faculty Sponsor: Sarah Boyle, Department of Biology

#72 The Effect of Multiplicity on Crayfish Aggression in Mixed Sex Compositions

Austin Armstrong, Sandra Ly, Sunny Mattancheril, Ashley Newman, Megan Ververis

Faculty Sponsor: Sarah Boyle, Department of Biology

#73 The Effect of Water Clarity on the Activity of Male *Procambarus clarkii*

Andrew Kochanski, Genevieve Farr, Alex Nicholson, Jonathan Fisher, Ryan Lisse

Faculty Sponsor: Sarah Boyle, Department of Biology

#74 Effect of Male Crayfish Pheromones on Female Aggressive Behavior

Matthew Roberts, Maggie Klusman, Ashlyn Cahill, Charles Walker

Faculty Sponsor: Sarah Boyle, Department of Biology

#75 Antagonistic Behavior between Female Crayfish when a Male Crayfish is Present

Cuyler Hines, Jess Newman, Reekah Northcross, Thao Pham, Logan Roach

Faculty Sponsor: Sarah Boyle, Department of Biology

#76 Variation in Stomatal Apertures Due to Changes in Light Wavelength

Steven Badami, Noosha Kamtarin, Rachel Kauffman, Nikki Schmader, Matthew Sommers

Faculty Sponsor: Michael Collins, Department of Biology

#77 Does the Temperature of Water Affect Agonistic Behavior of Crayfish?

Hillary Connell, Emily Krone, Jennifer Marshall, Alix Matthews, John Menz
Faculty Sponsor: Michael Collins, Department of Biology

**#78 Aggression Between Male Crayfish & Between Female Crayfish of the Species
*Orconectes virili***

Kate Evans, Michael Olushoga, Thomas Zigtema, Allison Julien
Faculty Sponsor: Michael Collins, Department of Biology

#79 Crayfish Habitat Preference of Shelter Over Sand

Boomer Malanchuk, Matt Walker, Jenna Sarett, Josh Goodwin
Faculty Sponsor: Michael Collins, Department of Biology

#80 Tree Stomata Density and Aperture and Tree Height

Sonya Kheshti, Mary Catherine Reeves, Rachel Stowe, Isabelle Hatfield
Faculty Sponsor: Michael Collins, Department of Biology

#81 Darker Substrate as it Relates to Aggression in Crayfish

Zac Hart, Ruth Mengistu, Lauren Miller, Rachel Wheeler
Faculty Sponsor: Alan Jaslow, Department of Biology

#82 The Effect of Substrate Depth on Crayfish Digging Behavior

Shamit Dua, Nicholas Jensen, Sahar Mokhtari, Hung To
Faculty Sponsor: Alan Jaslow, Department of Biology

#83 The Effects of Short Term Flooding on Stomatal Aperture

Maggie Blake, Alex Finkelson, Eden Johnson, Drew Link, Lauren Stokes
Faculty Sponsor: Alan Jaslow, Department of Biology

#84 The Effect of Light Color on Stomata Aperture Size in *Dianthus*

Andrew Capelluti, Allison Cowling, Tim Garton, Kristen Wendt
Faculty Sponsor: Alan Jaslow, Department of Biology

#85 The Effect of the Visual Environment on Aggression in Crayfish

Jessica Frizzell, Avidah Ramezanifar, Clark Schwab, Aron Siegelson
Faculty Sponsor: Alan Jaslow, Department of Biology

**#86 Does Distance from the Major Stem of a Plant Affect the Stomata Density of the
Adaxial Surface of the Leaf?**

Peter Ketch, Danielle Lenz, Elizabeth Medved, Hunter Yocum
Faculty Sponsor: Carolyn Jaslow, Department of Biology

#87 Behavioral Responses of Male Crayfish (*Orconectes virilis*) to Dynamic Visual Stimuli

Stephen Leavelle, Elyse Oakley, Anthony Perez, Ben Smith
Faculty Sponsor: Carolyn Jaslow, Department of Biology

#88 Does Water Temperature Affect Crayfish Respiration Rate?

Shawnecca Burke, Jake Magness, Joey Miller, Kira Reich, Jackson Roberts
Faculty Sponsor: Carolyn Jaslow, Department of Biology

#89 Will Crayfish Have a Color Preference in Sediment?

Jessica Becher, Jessica Brown, Desiree Buie, Rachel Schmelzer
Faculty Sponsor: Carolyn Jaslow, Department of Biology

#90 Possessive Behavior in Crayfish

Allie Elozory, Emmanuel John-Teye, Jae Lee, Monique Smyth, Chanrika Williams
Faculty Sponsor: Carolyn Jaslow, Department of Biology

#91 The Effect of Leaf Height on Adaxial Stomata Density

Melissa Coquelin, Maggie Goss, Rebecca Olivarez, Sarah Parkerson
Faculty Sponsor: Carolyn Jaslow, Department of Biology

#92 Frequency of Agonistic Behaviors Between Male/Male and Male/Female Interactions in *Orconectes virilis* Crayfish

Helen Floersh, Marian Hill, Rebecca Thompson, Alexander Tweel
Faculty Sponsor: Carolyn Jaslow, Department of Biology

#93 Effect of Green vs. Blue Light on Pansy Stomata Aperture

Liz Bigus, Hannah Breckenridge, Anna Gladfelter, Roberta Moore, Zack Smith
Faculty Sponsor: Carolyn Jaslow, Department of Biology

#94 Crayfish Behavior Responds to Modest Acid Exposure

Anjie Ash, Wenbin Du, Phat Ho, Jesse Hughes, Anuj Sharma
Faculty Sponsor: Carolyn Jaslow, Department of Biology

#95 Aggression in Female Crawfish When a Male is Present in the Tank

Aubrey DeVine, Julian Hawkins, Christian King, Ginny Whitman
Faculty Sponsor: Carolyn Jaslow, Department of Biology

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