Undergraduate Research and Creative Activity Symposium

May 1, 2009

Memphis, Tennessee

URCAS 2009 Schedule-at-a-Glance

	Location\Time	11:00	11:15	11:30	11:45	noon				1:00	1:15	1:30	1:45	2:00	2:15	2:30	2:45	3:00	3:15	3:30	3:45	4:00						5:45
Humanities	Frazier Jelke C	Philosopy and English								Religious Studies				Greek & Roman Studies					History									
	Orgill	Spanish: Carmen Martin Gaite								Spanish: Feminism					English				French									
Natural Sciences	Frazier Jelke B	Tracking Ecological Changes								Rhodes - St. Jude Summer Plus Program								Applications of Biochemistry										
	Frazier Jelke A													Measuring, Modeling, & Data Mining														
Fine Arts	417 Clough	Andy Warhol								Influences to Images																		
Social Sciences	Buckman 108													Economics														
	Buckman 110	Research within International Studies								Buckman Scholars						Studies of Education, Discrimination, and Social Responsibility												
	Buckman 212	Ethnographers and Sociologists at home and in the field I								Ethnographers and Sociologists at home and in the field II																		
	McCallum Ballroom	Poster Session 1 (11:00am-1:00pm)																				Poster Session 2 (4:00pm-6:00pm)						

Events

Awards Convocation: 9:00am, Hardie Auditorium
URCAS oral sessions: 11:00am – 4:00pm, various locations
URCAS Poster Session I & lunch reception: 11:00am – 1:00pm, McCallum Ballroom
URCAS Poster Session II & refreshments: 4:00pm – 6:00pm, McCallum Ballroom
(The refectory will have normal service and operating hours on May 1.)

Acknowledgements and Special Thanks to the following contributors:

Session Chairs:
Rosanna Cappellato, Assistant Professor of Biology
Stephen Ceccoli, Associate Professor of International Studies
Kathleen Doyle, Associate Professor of Modern Languages & Literatures
Marshall Gramm, Associate Professor of Economics & Business Administration
Sara Gremillion, Faculty Fellow in Biology
Erin Harmon, Assistant Professor of Art
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FINE ARTS SESSIONS

Andy Warhol

417 Clough, 11:00 am – 11:45 am
Session Chair – David McCarthy, Department of Art

11:00-11:15
Andy Warhol's Disassembled Pastoral
Rachel Touchstone
Faculty Sponsor: David McCarthy, Department of Art
Between 1964 and 1966, Andy Warhol produced three works that, when viewed together, compose a pastoral; on their own, however, they become the parts of what can be considered a disassembled pastoral. These works were "Flowers" (1964), "Cow Wallpaper" (1966), and "Silver Clouds" (1966). Because the pastoral is inherently a construction of parts, it makes sense to view Warhol's postmodern pastoral as a synecdochic pastiche – in other words, imitations of individual natural elements that are intended to stand for the genre as a whole. As a genre, the pastoral was intimately connected with poetry that was steeped in social commentary of provincial versus urban existence. A well-read artist, Warhol was immersed in the poetry of modern writers who mocked the state of nature in the modern period. As evidenced in the writings from several centuries, the pastoral genre changes in response to urban progress. Warhol's pastoral epitomizes this transformative quality of the pastoral, its disassembly becoming a literal reflection of nature's fate in industrial society.

11:15-11:30
Andy Warhol: Plays on Portrayal
Elizabeth Welch
Faculty Sponsor: David McCarthy, Department of Art
The pop artist Andy Warhol is famous for his iconic celebrity portraits of the early 1960s. His later, more traditional, commissioned portraits are less widely known and yet one of his most consistent subjects. By examining the idea of portrayal in his work, scholars can achieve a clearer picture of the work of one of the most enigmatic artists of the 20th century. Warhol's diverse portraits ranging from friends to royalty reveal tropes of style based on sitter's identity. A careful examination of these characteristics exposes three dominant types employed by Warhol. The first recalls Warhol's most successful piece, his Marilyn Monroe series. The sitters seem to be dominantly attractive, wealthy women. The second resembles the style of the Abstract Expressionist movement and is composed of many of Warhol's intimate friends. The third mimics plain newsprint and contains many of the most famous contemporary artists. These styles were employed based on the sitter's relationship to Warhol and fluctuate based on the important events in his life. This analysis of the artist's close affiliation to his body of portrait work, often considered superficial, reveals a deeper engagement than previously seen.

11:30-11:45
Warhol's Crazy Golden Slippers
Christine Zhu
Faculty Sponsor: David McCarthy, Department of Art
The paper I will be presenting, "Warhol's Crazy Golden Slippers" investigates some of Warhol's earlier works, his golden shoe collages, and how they foreshadow his later iconic Pop works. It poses the argument that Warhol developed his appropriative practices well before he shot to superstardom during the 1960s and identifies specifically some of the source materials he was looking at. Furthermore, the paper investigates the idea that Warhol's shoe collages were intentionally created based upon a specific celebrity for whom they were named, rather than arbitrarily named post-production. Each shoe exhibits specific attributes based on the respective celebrity's personality or persona. This fascination with the notion of celebrity extends to Warhol's later, immortalizing works of Marilyn Monroe, sharing a similar language of representation.

Influences to Images

417 Clough, 1:00 pm – 2:30 pm
Session Chair – Erin Harmon , Department of Art

1:00-1:15
Selves in Opposition: Drawings of Personal Interrogation
Alexandra Carter
Faculty Sponsor: Erin Harmon, Department of Art
In making art, I'm interested in the female body as the battleground of internal and external struggles. My compositions explore the body's violent, sexualized connotations within pop culture and art history while using details particular to the experience of my own body. Using myself as my model adds layers of meaning to the work, both personally and subjectively. Multiple selves enact different personalities as they conflict and/or collaborate in daily life. Figures perform a mimesis or masquerade of feminine identities as they poke and prod, taunting and tormenting one another. My recent work is executed in modes of both drawing and painting, in ink on drafting film. This allows my concept to become flexible and slightly more ambiguous at times, as the fluid, liberally applied layers of transparent ink take on yet another personality within the work, materially and physically. In this talk, I will discuss the development of this work, analyzing some of the concepts, forms, and processes that have become a part of its creation.

1:15-1:30
The Digital Canvas
Lauren Hampton
Faculty Sponsor: Erin Harmon, Department of Art
While preparing for the spring studio art Senior Thesis Show annually held in the Clough Hanson Gallery, I have spent time reflecting on the past and future of my work. My studio practice has been a culmination of both my personal interests as an artist and diverse skills gained over my years at Rhodes. The Art Department has helped me grow in countless ways, and I want to be able to showcase that growth. Particularly influenced by previous classes of Video Art and Design, I hope to represent the diversity of art and the various mediums through which it can be produced. Drawing from Constructivist ideology, I work to expand the definition of a traditional artist and what an artist can do. I aim to create something fresh while still maintaining a connection with the traditional past. Specifically, my work investigates the sensations produced by sound and its means of traveling through space. Sound and color are directly related; different tonal values produce a unique combination of emotions and colors in my mind. My art is a visual representation of the audible sounds; a recreation of musical notes in visual, artistic form.

1:30-1:45
The Art of Classification
Holly James
Faculty Sponsor: Erin Harmon, Department of Art
Working off the influence of artists like Ed Ruscha, autobiographical records of my belongings help me learn the definition of myself as a comparison to others. Observations provide the visual representation of the struggle I face placing myself within American society and culture. Continuously evaluating my surroundings, I keep a scientific record which helps me locate myself within cultural norms, making my art a taxonomy of my life. Using photo documentation, this work serves to organize and classify material possessions, experiences, and locations. Transforming images into printed objects and then installing those objects into galleries, abstracts them from their natural environment. Each image is placed under a series of organizational rules and categorization that allows my hand to be added. This play on site versus non-site relationships allows me to add my perspective into each piece through writing, sound, or illustrative narratives.

1:45-2:00

Created Space

Julianne Lindner

Faculty Sponsor: Erin Harmon, Department of Art

Exploring the traditional subject of landscape as humans' relationship with the land, I create imaginative worlds by juxtaposing flat bold colors, handmade cutouts and drawings, and collected materials. I work within the aesthetics of crafting, animation, and graffiti, and draw from the human-altered environment by appropriating its imagery. Manmade objects that mimic, moderate, or oppose nature are especially interesting to me. Certain ways of representation connote the relationships society has built with objects, for instance, billboards are silhouettes because they are so common that we look past them, forget them. They blend in and become a part of our environment as ghosts of our fabricated world, and it is important to remember and examine that dichotomy. At the same time as my paintings are eerie or ominous in a way, they are also magical or playful. I enjoy collage and mixing media such as spray paint, ink, marker, and light. I like trash and bits of string, and I often squirrel these collected artifacts away to use in my collage process.

2:00-2:15

Contemporizing the Flower Painting

Mary Pat Pead

Faculty Sponsor: Erin Harmon, Department of Art

Influenced by growing up in the tropical setting of central Florida's Gulf Coast, my paintings evoke the intensity of how warm sunlight amplifies the colors of flora, fauna, seawater, and flashy touristy surroundings. While my paintings may use parts of recognizable botanical references, I collage and reorganize these biomorphic shapes to create puzzled, abstracted compositions, and further abstract the imagery with bold, gestural brushstrokes. Possessing an average size of 5ft x 5ft, these large-scale paintings lead the viewer to take on the perspective of a bumblebee with their zoomed-in compositions that glorify small details found in the plants. With their Candy Land-esque, whimsical color palettes, my paintings have dominating presences and compel viewers to use their imagination in order to read the works. My URCAS presentation will explore the evolution of my paintings and studio practices from its initial inspiration to its final composition. While the exotic subject matter of orchids serve as reference, the paintings dictate what types of other biomorphic elements, shapes, and textures should be integrated to evoke their particular moods.

2:15-2:30

Manipulation to Preserve: Creating a New Way to See

Kathleen Perniciaro

Faculty Sponsor: Erin Harmon, Department of Art

This presentation covers the progression of my art practice and the creation of my thesis work. The work falls within the greater spectrum of process art and installation. My art is a process of subtly manipulating material to reveal its potential to exist beyond its function; bringing a renewed life to overlooked items. My hands become an important tool in exploring the possibilities of the material. A portable studio practice is carried out in order to better incorporate my daily activity and surroundings into the art. This is necessary since my interests lie in the everyday. Remnants from things past are precious to me, and I am drawn to material that's purpose is for preserving or packaging. I am inspired by things that are weathered; things that are misplaced, quiet, desperate, lonely, fragile; for example, telephone posts littered with rusted nails and matted paper from months of piled up fliers. I perceive both imperfectly patterned textures and weathered things to be underdogs in daily activity. There is strength in their fight to remain. This body of work begins a conversation about the value and aesthetics of overlooked items.

HUMANITIES ORAL SESSIONS

Philosophy and English (theme: economics)

Frazier Jelke C, 11:00 am – 11:45 pm
Session Chair – Rashna Richards, Department of English

11:00-11:15
Self-Interest and Morality: Mutually Exclusive or Inherently Linked?
George Joplin
Faculty Sponsor: Andrew Terjesen, Department of Philosophy
In a philosophical approach to the study of economics, my paper explores the degree to which self-interest is used in economic systems, and whether or not self-interest reflects a moral trait. It investigates and evaluates the arguments and interpretations of Adam Smith's moral philosophy and the degree to which Ayn Rand carries out Smith's argument. Although Rand's ideas on this matter are related to Smith's, she presents an argument totally separate from Smith. I conclude by rejecting Rand's approach to morality, stating that her moral philosophy is subjective, pluralistic, and ultimately problematic.

11:15-11:30
Judging Well-Being
William Smith
Faculty Sponsor: Andrew Terjesen, Department of Philosophy
Economics is usually thought of as a concrete, data-based discipline. There is, however, a large degree to which economics is a philosophical discipline. One major philosophical issue in economics concerns the understanding of "well-being." How economists understand the idea of well-being has important implications for economics as a science and for public policy. This paper explores the benefits and drawbacks of the dominant understanding of well-being, which is that well-being is measured by how well a person's preferences are satisfied. I conclude that, for all of the its problems, the preference-satisfaction view is the best approach for economists to evaluate well-being.

11:30-11:45
Considering Money: Anthony Trollope's World of Finance
Alex Nicoll
Faculty Sponsor: Gordon Bigelow, Department of English
Throughout many of his novels, Anthony Trollope demonstrates an accute attention to detail about money and finances. In some circumstances, such as with The Warden (1855), these details are important to the narrative itself, while in his Irish novel The Macdermots of Ballycloran (1847), details about financial transactions are not necessarily crucial to the story but instead serve as background information and metaphorical devices. Many times, his devotion to financial descriptions fail to move his story forward, even at times causing a disruption in the flow of his narration. This narrative disruption, however, frequently points toward and underscores a particular aesthetic effect of these novels. By providing such specific details about prices, wages, and income in his novels, these novels evoke his stories to a specific time and place, and thus contribute not to a universal literary consciousness, but an analysis to the contemporary problems of Trollope's era.

Spanish: Carmen Martin Gaite

Orgill Room, 11:00 am – 11:30 am
Session Chair – Kathleen Doyle, Modern Languages & Literatures

11:00-11:15

The Function of Gothic Elements in Carmen Martin Gaite's "El balneario" and "El Cuarto de atras"

Alycia Hayne

Faculty Sponsor: Kathleen Doyle, Modern Languages & Literatures

This investigation examines the function of gothic elements in two novels, El balneario and El cuarto de atrás, written by the Spanish author, Carmen Martín Gaite in 1955 and 1978 respectively. In each of the novels, the protagonists undergo seemingly "fantastic," experiences, where the border between fantasy and dream is blurred. The protagonist in El cuarto de atrás addresses her past by discussing her previous writing in El balneario. My study examines specific gothic elements, be they architectural settings, or a mysterious, possibly threatening man dressed in black, and their role in making the experiences of the female protagonists into a fantasy or a dream.

11:15-11:30

The Dream of Reality or the Reality of the Dream: Ambiguity and Contrasts in "El balneario"

Kelly Williams

Faculty Sponsor: Kathleen Doyle, Modern Languages & Literature

This presentation will examine the use of ambiguity, fantastic and dreamlike elements, and varying narrative styles in "El balneario" by Carmen Martin Gaite and the manner in which these literary techniques provide support for the central argument of the novel. "El balneario" is divided into two main parts: in the first part, the protagonist Matilde narrates in first person a very surreal experience. In the second part, a third person narrator reveals that this entire episode was a dream and shows what happens after Matilde awakens from her dream. This presentation will explore the contrasts between these two parts, as well as the inconsistencies within each section. By evaluating Matilde's changing attitude toward order and disorder and the differences between her interpersonal relationships in the first part and those in the second, the presentation will shed light on the nature of the awakening that Matilde experiences through her dream and the influence of this experience on her life outside the world of the dream. It will show that the occurrence of the dream reflects Matilde's ongoing search for her own identity and for certainty in her life. Finally, it will demonstrate how Martin Gaite used the text as social commentary.

Spanish: Feminism

Orgill Room, 1:00 pm – 2:00 pm
Session Chair – Kathleen Doyle, Modern Languages & Literatures

1:00-1:15

Ley anticuada: la desigualdad y el feminismo en "El artículo 438" (Antiquated Law: inequality and feminism in "El artículo 438"

Jessica Powers

Faculty Sponsor: Kathleen Doyle, Modern Languages & Literatures

Carmen de Burgos was very involved in the movement for the advancement of women in Spain at the end of the nineteenth and beginning of the twentieth century. An author whose agenda was multifaceted, she wrote self-help books for women as well as essays that expressed the need for change in society to create equality for women. One can also see Burgos's view of society in her fiction. In her short story, "El artículo 438", written in 1921, which begins with a citation of article 438 of the penal code from 1870 (a law which permits a husband to kill if wife if he catches her in the act of being unfaithful), Burgos reveals an antiquated law. This paper intends to show how her story exposes the hypocrisy of society, since if the

situation were reversed and the husband were the unfaithful one, the wife would not have the power to act in any way regarding the situation. The paper will also show how, in this story, Burgos shows the need for women to be more educated regarding the law and society as a first step in bringing about significant social change and the expansion of their rights before they are able to bring about change.

1:15-1:30

The Subversion of Gender in the Poetry of Ernestina de Champourcín

Emily Sellers

Faculty Sponsor: Kathleen Doyle, Modern Languages & Literatures

Spanish poetry has long been the domain of men. This continued to be the case in poetry of the "Generation of 27," the title of a group of poets who published around 1927. This poetry was defined by the "dehumanization" of art which called for the removal of the anecdotal, sentimental and subjective from poetry as the means of attaining transcendental truth. This characterization of the Generation of 27, however, overlooks the contribution of female poets who differed from the one-sided, male vision. Of the female poets of the Generation of 27, Ernestina de Champourcín is the most famous. In the poetry of Champourcín, transcendence is a mystical, emotional, and personal experience. Champourcín borrows from the traditional forms and literary devices for her own vision of gender in two love poems. This paper analyzes the inversion of these poetic tools when used by a feminine voice. This transformation, coupled with Champourcín conscious avoidance of grammatical gender markings in these poems, serves as a critique of the androcentrism of Spanish poetry and society. In these poems Champourcín creates a powerful female figure who subverts gender expectations and gives voice to an alternate understanding of the role of gender in interpersonal relationships.

1:30-1:45

La heroína inocente perseguida dentro de la protagonista moderna en De amor y de sombra

Leigh Swiger

Faculty Sponsor: Kathleen Doyle, Modern Languages & Literatures

La protagonista de la novela De amor y de sombra, Irene, es una heroína moderna; pero, la novela misma está estructural y temáticamente relacionada a las fábulas de las heroínas inocentes perseguidas. Por lo tanto, De amor y de sombra, de Isabel Allende, es una versión moderna del género de la heroína inocente perseguida con una heroína moderna pero tiene la estructura y los temas tradicionales. Juzgando de tres análisis separados de De amor y de sombra y las fábulas tradicionales, es muy evidente que Irene es una heroína moderna dentro del género tradicional de heroína inocente perseguida. El primer análisis es de la protagonista Irene. Esta exploración dentro de De amor y de sombra es una investigación de cómo ella desempeña el papel de heroína en el sentido moderno. Después del primer análisis es apropiado y necesario hacer unas investigaciones sobre el dilema tradicional de la heroína Irene en un mundo moderno. Esta exploración va a examinar cómo Irene reconcilia las aspiraciones personales con las demandas de la sociedad que no apoya esas aspiraciones. La última sección de este trabajo final explora una comparación entre De amor y de sombra y el género de la heroína inocente perseguida.

1:45-2:00

Alicia Partnoy: The Testimonial Voice of a Desaparecida

Elise Dudley

Faculty Sponsor: Kathleen Doyle, Modern Languages & Literatures

My presentation explores the testimony of Alicia Partnoy and her experiences as a desaparecido during the Dirty War, or el Proceso, in Argentina (1976-83). She was imprisoned in "La escuelita," a detention center in Bahía Blanca. Through a series of fragmented memories, Partnoy's testimony reveals the brutality, inhumane repression, and the living conditions of a desaparecido. The disorientation strips her identity and in many ways, reduces her sense of her own humanity. Through her testimony we can see what mechanisms Partnoy utilizes to save her own voice and her identity in the face of such tragic and cruel conditions. The torture, dehumanization, isolation, and disappearance of her own voice are the four primary conditions that challenge Alicia's human condition. Through these four elements I explore how her solitary

discourse helps us to understand something much larger—How does one's voice keep one from being annihilated in the face of such conditions?

Religious Studies

Frazier Jelke C, 1:00 pm – 1:45 pm
Session Chair – Michelle Voss Roberts, Department of Religious Studies

1:00-1:15

On Anxiety: Martin Luther and Soren Kierkegaard

Lacey Hudspeth

Faculty Sponsor: Michelle Voss Roberts, Department of Religious Studies

On March 14, I was one of eight undergraduates who presented at the Southeastern Commission for the Study of Religion. The paper I presented, that I would subsequently like to present at URCAS, is entitled, "On Anxiety: Martin Luther and Soren Kierkegaard". It first lays out an Existentialist notion of the absurd and presents the question, "if my life is futile, why should I not commit suicide, and indeed, how can I find a modicum of meaning within the absurdities of life?" This is followed by an examination of a Christological lens through which both Martin Luther and Kierkegaard view anxiety, and then a subsequent examination of Luther and Kierkegaard's doctrine's of anxiety. The end of the paper wraps up a discussion of how both Luther and Kierkegaard agree that it is only faith that can alleviate anxiety, and ties all of the discussion back to the Existentialist notion of the absurd. During my presentation, I will primarily be reading the paper, and then I will have a series of discussion questions to generate dialogue about the objections I opine throughout the paper.

1:15-1:30 (WITHDRAWN- 29 April 2009)

Global Warming, Climate Change and the State of Our Nation: Why We Need Christian Churches to Lead a Reformation Movement in America.

John King

Faculty Sponsor: Michelle Voss Roberts, Department of Religious Studies

America is currently in a state of crisis. We are facing potential economic disaster, environmental degradation, and various forms of social injustice. Beyond these on-going issues, we are faced with the realities of global warming and climate change that threaten our existence, as we know it. Scientists have long predicted, and continue to predict, unprecedented global disasters due to global warming. In light of these issues, leaders in our government continue to argue and debate as if there is time to waste, governing from the framework of political ideology rather than fighting for what is right and best for the future of America. My paper will contextualize these politicized issues as Christian issues. Using biblical texts as well as scholarly literature, I will argue that it is the imperative and duty of all Christians to come together in one united effort to demand action on behalf of our government. I will explain why it is necessary for the Churches to lead and draw on past examples in which American Christian Churches influenced and played a role in shaping national policy.

1:30-1:45

Why Didn't I Learn This in Church: Examining the Liberal Minister's Use of Biblical Criticism

Lars Nelson

Faculty Sponsor: Steven McKenzie, Patrick Gray, Department of Religious Studies

As part of their formal training, seminarians receive instruction in the historical-critical approach to the Bible. Once ministers, some question whether this education filters down to the congregational level. Describing this interesting phenomenon, Bart Ehrman's recently published Jesus Interrupted argues that ministers fail to preach or teach this biblical scholarship to their parishioners. While true of some preachers, this project tests the versatility of Ehrman's claims. Research interviews have revealed that liberal ministers in Memphis do not, in fact, leave the scholarship on the shelf when they preach or teach. While liberal

ministers tend to exclude biblical criticism from sermons, it is for practical reasons, such as time and appropriateness, not fear of sharing challenging ideas. Even so, they do include scholarship to provide the necessary background or when otherwise relevant to the day's message. In the classroom, liberal ministers willingly unpack biblical criticism, enjoying the functional benefits of this more intimate setting. Ehrman's picture differs greatly from these discoveries, demonstrating his model's deficiency when applied to ministers who make liberal claims about the Bible. Additionally, these findings shed light on the compatibility of historical criticism and faith, arguing that Christians who take the scholarship seriously benefit from doing so.

Greek and Roman Studies

Frazier Jelke C, 2:00 pm – 3:00 pm
Session Chair – Joe Jansen, Department of Greek and Roman Studies

2:00-2:15

Hesiod and Euripides: A Structural Look in the "Theogony" and the "Bacchae"

Kelly White
Faculty Sponsor: Kenny Morrell, Department of Greek and Roman Studies

According to Herodotus, "It was Homer and Hesiod who created for the Greeks a genealogy of the gods, gave the gods their epithets, distributed their honors and competences, and stamped them with their forms." Hesiod's Theogony attempts to present an overview of the gods' genealogy, following a definite pattern and proving each god's divinity. Euripides' play The Bacchae, serves as a Theogony through Dionysus, who finds himself having to prove his identity and divinity. In his "Poetics," Aristotle states that poetry, especially tragedy, serves as a successor to epic, making "Theogony" part of epic tradition. He believed an epic should contain all the ingredients of a good tragedy, once again creating a definite pattern. In addition to containing structural similarities, both texts present a cosmic struggle, pairing each generational succession with some sort of intergenerational conflict, as well as various external forces. The purpose of this paper is first to establish what should be accomplished by a Theogony, and then decipher the pattern involved in its construction. I will then compare the purpose and structure of that poetical genealogy to the arrangement of events presented in The Bacchae. Euripides' play constitutes a myth of origins just as Theogony does, and stretches beyond the birth of mankind into the genesis of tragedy itself.

2:15-2:30

Pygmalion and Pandora: A Feminist Exploration of the Ivory Maiden's Mythological Origins

Julia Draper
Faculty Sponsor: Kenny Morrell, Department of Greek and Roman Studies

In the Hesiodic tradition, the story of Pandora explains the existence of mortal women. Hephaestus creates her at Zeus's behest to avenge Prometheus's theft of fire. She is a deceptively beautiful creature in appearance, but her outward beauty merely serves to conceal her true nature. Ovid's Metamorphoses has inherited the concept of Pandora, and this paper will focus on the resonances of that myth in Ovid's story of Pygmalion (X.238-297). Ovid begins the story by mentioning the Propoetides, women who denied the divinity of Venus and were forced to prostitute their bodies, eventually turning into stone through lack of shame for their criminal deeds. Pygmalion, in response to this, refuses to take a wife, and attempts to create the perfect woman out of ivory—a virgin who is beautiful, modest, and pure, yet initially as lifeless as she is visually perfect. My paper will explore the ideas of deception, creation, and image set forth in these myths, and will attempt to represent Pygmalion's ivory maiden as both a reaction to and an evolution of Hesiod's Pandora. In the process, I will illuminate historical conceptions of art and nature, with regard to their limitations and their power to deceive.

2:30-2:45

Echoes of Hesiod in Catullus's Carmen 64

Anna Lovel

Faculty Sponsor: Kenny Morrell, Department of Greek and Roman Studies

Catullus writes his epyllion, 64, in the tradition of and in response to Hesiod's poetry. The Theogony recounts the succession from one generation of gods to the next, ending with Zeus's reign. In Works and Days, Hesiod focuses on the fall of mankind from harmony with the gods in the Golden Age to separation from the gods and strife in the Iron Age (106-201). Catullus addresses both of these progressions in his depiction of the wedding of Peleus and Thetis. The wedding and the resulting child constitute an anti-theogony. The marriage of Thetis, a goddess, to Peleus, a mortal, is the mechanism by which Zeus prevents a subsequent generation of gods from challenging his reign. Catullus nests the story of Theseus and Ariadne within the narrative of Peleus and Thetis as an ekphrasis (50-266). Catullus draws parallels and creates contrast between the two relationships through clever manipulation of time and place. His examination of the two relationships provides a commentary on heroism and the interaction of gods and mortals. Catullus uses the Song of the Fates (320-381) to juxtapose two aspects of Achilles, the hero and the murderer. In Works and Days, shortly after the Trojan War and the death of Achilles, the Heroic Age degenerates into the Iron Age. In Achilles, Catullus examines the entire Heroic Age through its greatest hero. Both Catullus and Hesiod focus on the downward progression of mankind from the Heroic Age to the Iron Age; however, their treatment of Achilles is different. The comparison of Achilles's two aspects, like the comparison between the two relationships, allows Catullus to examine the Heroic Age and the nature of a theogony.

2:45-3:00

Monuments of Rome in the Films of Federico Fellini: an ancient perspective

Mackenzie Zalin

Faculty Sponsor: David H. Sick, Department of Greek and Roman Studies

The films of Italian director Federico Fellini that take place in modern Rome rely upon monuments in order to define the city as a unique microcosm of humanity, a setting that is so enormous and diverse that it frequently overwhelms the onlooker with its antiquity and grandeur. Because Rome's monuments constitute a palimpsest of Western civilization, Fellini calls upon a selection of these mnemonic markers in order to summarize specific aspects of the city's layered past according to first-hand experiences. In order to make sense of Rome's voluminous history and ultimately make the city his own, Fellini follows in the footsteps of his ancient literary progenitors by appropriating monuments on a personal level and employing them towards the creation of a chronologically and thematically synoptic Rome. By juxtaposing a selection of Fellini's films with works from the Augustan age by authors such as Horace, Livy, Virgil, and Ovid, this comparative study will demonstrate that Rome is unique in its ability to transcend time and space by means of its monuments and thereby become part of the imagination for all to invent and experience uniquely.

English

Orgill, 2:15 pm – 3:00 pm

Session Chair – Jason Richards, Department of English

2:15-2:30

D(a)edalus and Joyce

James Kingman

Faculty Sponsor: Brian Shaffer, Department of English

Stephen Dedalus, James Joyce's dramatization of himself in A Portrait of the Artist as a Young Man, is often interpreted as a young man who sets out with great ambition but meets utter failure. The image of Icarus, hubristically flying too close to the sun and drowning as a result, is often used to characterize the aspiring artist. However, the story of Daedalus and his son Icarus is a complicated myth rather than a morality fable. The imagery also includes the labyrinth, the Minotaur, Ariadne's thread, and other aspects

which are used in more subtly by Joyce to relate the story of Stephen's rejection of religion, nationality, and family. Fitting with a follower of literature, philosophy, history, and art, Joyce structures the development of the character which represents Joyce himself in a myth centered on the world's first exiled artist. Though it seems paradoxical that an author so concerned with rejecting the flawed institutions of the past to use myth—the oldest of influences—to depict this story, a careful consideration of the entire myth in relation to Joyce's writings reconciles the apparent discrepancy.

2:30-2:45

Internalizing Heaven and Hell: The Satanic and Godly Modes in Milton's Paradise Lost

Andrew Miller

Faculty Sponsor: Scott Newstok, Department of English

In John Milton's Paradise Lost, the internalization of motives and modes of thought takes two drastically different forms, that of the revolving inner Hell of Satan and the "paradise within" promised by a God that retires after humanity has fallen. What characterizes these differing modes of thought? The question raises both poetic and metaphysical concerns, and perhaps these ideas are more entwined than a first glance allows for. Making use of a philosophical framework of identity and difference established by Martin Heidegger, I attempt to explore what consequences these Godly and Satanic modes of being present to readers of Paradise Lost.

2:45-3:00

A Bend Towards Darkness: V.S. Naipaul's Critique of Post-colonial Waste

Noah Black

Faculty Sponsor: Jason Richards, Department of English

The post-colonial author V.S. Naipaul is often hailed as the heir to Joseph Conrad, and this link is especially clear in Naipaul's novel A Bend in the River, which takes place in the same Belgian Congo that Conrad explored in Heart of Darkness. One of the links between the two novels is the excessive waste of resources, both machine and man, that exists in both the imperial Africa of Conrad and the post-colonial Africa of Naipaul. Naipaul's repetition of ideas and images that were first presented by Conrad is form of mimicry, and this shows that, despite the freedom that Africa has gained, little has changed for the African citizens. This is Naipaul's critique and condemnation of both the practices of imperial Europe and of post-colonial Africa. For Africa, the civilized West is an ideal that they aspire to, but Africa's direct experience with the West has been with the horrors of imperialism, and not the luxuries of modernity. This results in the African attempt to mimic the West being corrupted, as their attempts are a mimicry of the excessive violence and waste of the imperial West, and not the modernity and civility that they see and idealize.

History

Frazier Jelke C, 3:15 pm – 4:00 pm

Session Chair – Anthony Siracusa '09

3:15-3:30

The Development of Nationalism in Central Eurasia

Cody Behles

Faculty Sponsor: Clayton Brown, Department of History

This paper examines the importance of the cultural and historical aspects of ethnic nationalism and discusses how important these factors are in determining the paths taken by modern ethnic movements. The vast majority of literature in the field suggests that nationalism arises from culture and history, but the research concludes that this may not necessarily be the case. In order to prove whether or not culture and history are merely the tools of nationalism or function as foundational necessities, my research examines four cases which offer some control over the variables of culture and history. The Kazakh, Uygher, Manchu, and Mongol ethnicities all draw their history and culture from Sinitic traditions and have

experienced similar macro political patterns (empire to communist rule). Despite this, none of the cases examined have had similar experiences with asserting their national identity. This seems to be at odds with the traditional understanding of culture and history as they pertain to ethnic nationalism. Although both are vital to the creation of an ethnic identity it does not seem that a strong tradition in either variable begets a strong nationalist movement. Rather, the strength of a nationalist movement is based on the successful manipulation of these traditions.

3:30-3:45

Body-Based: The West's Emphasis on Physical Hierarchies

Morgan Rote

Faculty Sponsor: Gail Murray, Department of History

In my paper I analyze an essay by Oyeronke Oyewumi - entitled Visualizing the Body: Western Theories and African Subjects- I explore the extent to which Western society creates an unjust hierarchy of bodies based on the individual as a visual object. I affirm her argument that women and people of color are relegated to the physical realm, without the possibility of escaping such embodiment and reaching the higher level of thought and intellect that white men occupy. Such visual observation encourages passive action; relying on sight simplifies the individualâ€™s full identity and perceives merely the surface level of reality. This method of observation contrasts with other non-western cultures that focus instead on the interaction of the senses, especially that of sound, to achieve a more complex understanding of the world. Oyewumi thus urges Western society to surpass the sense of sight to realize a multiplicity of senses and thus a deeper understanding of the world. Hence I conclude my own analysis by examining the practical implications of such a theory. While individuals may naturally default to the West’s body-centric mindset, merely acknowledging this tendency will alter their frame of thought. Enlightened individuals must shift their intentions to reject body-centricity and instead adopt a deeper, truer understanding of identity.

3:45-4:00

Culture of Power: Defining an Elite Identity in Post-Revolutionary Haiti

Daniel Williford

Faculty Sponsor: Jeffrey Jackson, Department of History

Culture of Power: Defining an Elite Identity in Post-Revolutionary Haiti examines how the Haitian elite community, especially mulatto elites, developed a unique cultural identity after independence as a result of its intermediary position between the Haitian rank and file and the outside world. This group combined a somewhat fabricated sense of nationality with an affinity for French art and literature in an environment permeated by African influences. Attempting to balance these three cultural components of their society (the Haitian, the French, and the African), elites were forced to rely on them all in order to maintain control. The Haitian upper class also used legal and frequently violent means to define its boundaries. Rigid occupational codes officially restricted social mobility while the elite monopoly of education further reinforced class division. However, the process of creating of an elite identity also involved distinguishing these new elites from their European counterparts by emphasizing their uniquely “Haitian” characteristics and occasionally their African origins. Evidence that the Haitian upper class was gradually solidifying in the years following independence can be found in constitutions, government decrees, treatises by Haitian intellectuals, poetry, and travel accounts written by outsiders.

French

Orgill, 3:15 pm – 4:00 pm
Session Chair – Katheryn Wright, Modern Languages & Literatures

3:15-3:30

La corrélation entre l'argent et la moralité dans Les Misérables de Victor Hugo

Robert Crooks

Faculty Sponsor: Katheryn Wright, Modern Languages & Literatures

The paper I wish to present pertains to the correlation between money and morality in Victor Hugo's Les Miserables. Hugo depicts a society in which the poorest classes are unfairly treated by a government that goes out of its way to protect the bourgeois community. Written in French, my paper contends that the moral and virtuous characters in Les Miserables are those who are rejected by society due to their status as criminals or poor people. Because of their status as rejects, they are not directly influenced by the government's corrupt ideologies and are thus immune to contamination. On the other hand, those who uphold the government's values and laws, such as policemen and average citizens, are inherently immoral due to their existence within the social structure established by the government. In focusing on specific interactions between characters of different social classes and backgrounds, my paper attempts to establish the disparity in morality between the poor characters and the characters of the higher social classes. The correlation between morality and socio-economic class in Les MIserables becomes clear through close analyses of the interactions between the main characters.

3:30-3:45

Le Rôle du Lecteur dans Métaphysique des Tubes

Elizabeth Kalescky

Faculty Sponsor: Katheryn Wright, Modern Languages & Literatures

My intension is to analyze Amélie Nothomb's Métaphysique des Tubes (a work of contemporary French fiction published in 2002) through the metafictional lens. Through her use of an unreliable narrator, she forces the reader to play a role above and beyond that of ordinary fiction, and for this reason, we can view her work as metafictive. I briefly summarize the theory behind unreliable narration and metafiction (which is surprisingly similar). I proceed by showing Nothomb's narrator as unreliable in that she speaks in two distinct voices, which are distinct by an age difference of likely forty years. The bulk of my paper focuses more on demonstrating the metafictional characteristics of novel. I discuss authorial intrusion and the book's inherent self-awareness, a characteristic of metafiction. I also focus on the role an unreliable narrator forces the reader to play. I conclude by alluding to the possibility that Nothomb wants to transcend the Nouveau Roman where the reader is considered a co-creator to the reader as being simply creator, she is shifting the paradigm of fiction. I intend to present in French.

3:45-4:00

Un Martyr de la vérité: la sincérité et l'autheticité de Meursault dans L'Etranger

Ursula Hanson

Faculty Sponsor: Katheryn Wright, Modern Languages & Literatures

This research paper in French examines two philosophical concepts present in L'Etranger by Albert Camus. The first concept consists of Meursault's ultimate authenticity and sincerity, which I will discuss as having been redefined by Lionel Trilling in his work Sincerity and Authenticity. These two qualities, which are redefined as being almost unattainable because of society and its negative impact on such attributes, become evident in Meursault during his trial. This paper also analyses how the characters during Meursault's trial, the judge, the prosecutors, the jury and the priest, illustrate a microcosm of society that propagates hypocrisy and negative judgments against a person who does not publicly exhibit "feelings" or "morals" that would make him part of the "normal" society. As Meursault realizes his own difference against others in society, he becomes even more determined to rest as he is: authentic and sincere.

NATURAL SCIENCES ORAL SESSIONS

Tracking Ecological Changes

Frazier Jelke B, 11:00 am -11:45 am
Session Chair – Rosanna Cappellato, Department of Biology

11:00-11:15

The impact of global climate change on the new recruits of a scleractinian coral, Porites astreoides

Dustin Long
Faculty Sponsor: David Kesler, Department of Biology
Samantha de Putron, Bermuda Institute of Ocean Sciences

Anthropogenic carbon emissions have increased since the beginning of the industrial age, causing sea surface temperatures to rise in many regions. With the ocean acting as the only true carbon sink, this excess carbon is causing the pH of the oceans to drop, or ocean acidification. This change in ocean chemistry lowers the saturation state of aragonite, the type of calcium carbonate that reef corals precipitate as skeletons. We investigated the effects of ocean acidification and climate change on the new recruit (spat) development of a brooding, scleractinian coral, Porites astreoides, focusing on skeletal area and zooxanthellae density. Recruits were exposed to three degrees of saturation state; (approx. 4.01, 2.84, and 1.41) through CO2 bubbling along with ambient (28C) and increased (31C) seawater temperatures for periods up to four weeks after planulae settlement. A broader temperature range in ambient seawater was also tested. A significant drop in skeletal area was seen at ambient temperature from mid to low saturation state; while no difference was seen with spats reared at increased temperature across varying saturation state; giving evidence for temperature mitigation of lowered saturation state. Thus, a more complex relationship than previously thought exists among scleractinian corals, climate change, and ocean acidification.

11:15-11:30

CHANGES IN SEEDLING ABUNDANCE AND SOIL CHARACTERISTICS BY ENGLISH IVY (HEDERA HELIX) IN OVERTON PARK

Jennifer Lambeth
Faculty Sponsor: Rosanna Cappellato, Department of Biology

The incidence of the invasive species English ivy in Overton Park (Memphis, TN) and the environmental conditions of invaded areas were studied. Total English ivy cover was estimated to be 2.48% of the old growth forest. To identify the conditions sustaining English ivy growth, soil pH, temperature, and anion and cation levels as well as light levels were compared between plots with ivy (PWI) and without ivy (PNI). Soil temperatures and light levels were significantly ($p<0.05$) lower in PWI. Lower light levels in PWI suggest that English ivy prefers to grow in shaded areas, and lower soil temperatures in PWI are likely due to the dense ivy ground cover that reduces soil exposure. Preliminary analysis of soil anions and cations showed significantly ($p<0.05$) lower levels of phosphorus, potassium, and soil pH present in PWI. Low soil nutrient levels in PWI may indicate significant nutrient uptake by English ivy.

11:30-11:45

ASSESSING AMPHIBIAN MARKING TECHNIQUES IN RECENT TOAD METAMORPHS: RELIABILITY, EFFECTS ON SURVIVORSHIP AND PHYSIOLOGY, AND CONSERVATION IMPLICATIONS

Stephanie Cassel
Faculty Sponsor: Jonathan Davis, Department of Biology
Andy Kouba, Memphis Zoo

Global amphibian declines are a rapidly spreading problem resulting in significant reductions of amphibian populations. Monitoring of wild populations and reintroduction of captive-bred individuals has key

conservation implications. We empirically examined the reliability of four marking techniques: Toe Clips (TC), Visual Implant Elastomers (VIE), Passive Integrated Transponders (PIT), and Alpha-Numeric Fluorescent Tags (Alpha Num), in identifying individual metamorphic Fowler's toads (Anaxyrus fowleri) (<60 days post-metamorphosis, mean mass ± 1SD = 1.50 ± 0.61 g). We also determined whether marking techniques affect survival, growth rate, or physiological performance. We measured terrestrial and aquatic locomotion as well as water balance to evaluate physiological performance because these variables can influence survival. After 150 days, VIE (77%) and Alpha-Num (46%) accurately identified a lower percentage of individuals than TC (100%) or PIT (100%). Moreover, none of the marks affected survival or water balance and only PIT negatively affected growth rate (<20% mass gain versus 50-110% for others). The evaluation of marking techniques is not novel, yet studies of their effects on survival and physiological performance are rare. This study will identifiy the most reliable and least-invasive marking technique for small amphibians, which can aid population monitoring programs and improve assessment of reintroduction programs' success.

Rhodes - St. Jude Summer Plus Program

Frazier Jelke B, 1:00 pm – 1:30 pm

Session Chair – Laura Luque de Johnson, Department of Biology

1:00-1:15

Elucidating Drug Meachanisms Using Real-Time Cell Electronic Sensing (RT-CES)

James Davis

Faculty Sponsor: Loretta Jackson -Hayes, Department of Chemistry

Qingxin Mu, Bing Yan, St. Jude Children's Research Hospital

With the advent of high-throughput screening, the demand for cell-based assays has grown. Conventional cell-based assays are only end-point assays and usually require some type of label. The real-time cell electronic sensing (RT-CES) system allows for noninvasive real-time measurements of impedance caused by changes in cell number, viability, morphology, and adherence. In this study, we used this technology in an attempt to develop a screen to elucidate mechanisms of novel drugs by analyzing the different kinetic profiles. Eighteen chemotherapeutic drugs of four known mechanisms (tubulin acting, topoisomerase-II inhibitors, antimetabolites, and alkylating) were added to three neuroblastoma cell lines(CHLA-15, CHLA-20, CHLA-90). Tubulin active drugs exhibited a unique kinetic profile. After an initial decrease in cell index, a second peak was observed after ~36h after addition of drug. Time dependent cell-number showed this second peak was not an increase in cell number. These findings indicate that tubulin active drugs have a unique measurable kinetic profile, which could potentially be used for a secondary screen in drug discovery.

1:15-1:30

Obesity Among Childhood Hodgkin Lymphoma Survivors

Amanda Hoeffken

Faculty Sponsor: Chris Seaton, Department of Mathematics & Computer Science

Monika Metzger, St. Jude Children's Research Hospital

PURPOSE: Hodgkin lymphoma (HL) survivors are at increased risk of therapy-related long-term complications that can be further intensified by obesity. With the increased risk of obesity in the United States, it is important to characterize if Hodgkin Lymphoma survivors are at increased risk of obesity. OBJECTIVES: Identify risk factors at diagnosis that predispose the obesity in HL patients treated at St. Jude Children's Research Hospital between 1990 and 2007. METHODS: Body mass indices of 341 patients with HL were compared to NHANES data at diagnosis and last assessment. Odds ratio for obesity at last assessment was calculated. RESULTS: Obesity rate among HL survivors is comparable to that of the general population. Age at last assessment, being overweight or obese and hypothyroidism were all

associated with obesity. CONCLUSIONS: Adult survivors of pediatric HL have an increased risk for obesity. Early intervention for weight control should be implemented at diagnosis.

Measuring, Modeling, and Data Mining

Frazier Jelke A, 1:30 pm – 3:15 pm

Session Chair – Patrick Vernon, Department of Mathematics &Computer Science

1:30-1:45

Automatic Abstraction of Plant Seed Diameters through Images

Neema Patel

Faculty Sponsor: Betsy Williams, Department of Mathmatics & Computer Science

Jonathan Fitz Gerald, Department of Biology

This work involves the automatic detection of a plant seed diameter from a black and white image. Automatic detection allows for an accurate measurement of the seed, rather than measuring it manually. Such measurements provide a higher, accurate comparison. Research has involved creating computer algorithms and understanding the mathematical aspects behind computer programming. Algorithms include locating the actual seed through pixel value comparisons between the image and a template. By moving the black and white template along the image, the algorithm calculates the sum of the differences of pixel values; the area with the least sum is the location of the seed. In this talk, I will discuss the algorithm and its functions.

1:45-2:00

Ultrasonic measurements of fluid viscosity

Jenna Smith, Stephanie Milazzo

Faculty Sponsor: Brent Hoffmeister, Department of Physics

One way to characterize a fluid is to measure its viscosity, or "thickness." Traditionally this is measured by a viscometer. We have created a new viscosity measurement system that uses ultrasonic transverse waves created by a piezo-electric crystal. By observing how the fluid affects the oscillation of a crystal, we can back out a value for the viscosity. This technique can be used to study fluids that are more difficult to study using a traditional viscometer, like magnetorheological fluid.

2:00-2:15

Functional group based design of novel cholesterol moderating drugs using Ab Initio and DFT methods

Hunter Utkov

Faculty Sponsor: Mauricio Cafiero, Department of Chemistry

Statin Drugs mediate cholesterol levels by inhibiting the second step of the cholesterol biosynthesis pathway. In this rate-limiting step of the pathway, HMG-CoA is reduced to mevalonic acid by the enzyme HMG-CoA reductase. The statin drug molecules displace the substrate HMG-CoA in the enzyme active site via competitive inhibition. We are investigating the weak binding forces involved in the binding of ligands to the enzyme HMG-CoA reductase in order to develop possible modification to current statin drugs which can improve their ability to inhibit the enzyme. We use correlated post-HF Ab Initio and several standard and novel DFT methods to study important ring-ring type dispersion and induction interactions that are not currently used by statin drugs. We show that these interactions are important and contribute to binding with similar weight as hydrogen bonds and ion-dipole interactions. We have identified several functional groups and trends that result in greatly increased binding to the enzyme. We believe that novel drug molecules that take advantage of these forces can be important in the next generation of statins.

2:15-2:30

Relative stability of complexes of six-membered carbon-rings with variable numbers of double bonds: DFT and ab initio results

Michelle Shroyer

Faculty Sponsor: Mauricio Cafiero, Department of Chemistry

We examine various model chemistries for their ability to predict counterpoise-corrected interaction energies and relative stabilities of complexes of six-membered carbon rings. Interactions between aromatic rings and small hydrocarbon rings and chains can serve as models for the weak dispersion interactions present in protein/ligand binding which are difficult to model with current computational methods. Using MP2/aug-cc-pvdz as a standard, we evaluate MP2 with several basis sets, as well as Hartree-Fock and several DFT methods for their ability to mimic the MP2/aug-cc-pvdz interaction energy results. We find that smaller basis sets within the MP2 theory deliver accurate trends and relative energies of complexes compared to aug-cc-pvdz, and the HCTH407 DFT method can deliver accurate relative energies for most of the complexes studied here.

2:30-2:45

Electrical Orbit Stability

Bradford Taylor

Faculty Sponsor: Shubho Banerjee, Department of Physics

With the planets as his motivation and data sources, Kepler derived his 3 laws of planetary motion due to the gravitational force. Since then our studies and understanding of orbits has been largely limited to the gravitational case. However, as Rhodes students illustrated, orbits between bodies are not limited to the gravitational force and are possible with the electrostatic force. This talk introduces some of the concepts involved in my research from last summer. In it we will explore the theory behind orbits mediated by the electrostatic force. We will see that despite some similarities between the two forces, electric polarization within conducting objects results in noticeably different behavior in the electrostatic case.

2:45-3:00

Combinatorial Game Theory

Whitney Duval

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

My senior project is focused on Combinatorial Game Theory. I have been studying impartial games similar to the famous game Nim under normal play. The games I examine are played on number partitions, represented by Ferrer's diagrams. I have focused on two games in particular, Rim Nim and BaRec. I have proven several nice results, some of which I will discuss in my talk.

3:00-3:15

Data Mining the NEILS Database

Albernie Ferguson

Faculty Sponsor: Rachel Dunwell, Department of Mathematics & Computer Science and Janet Panter, Department of Psychology

The National Early Intervention Longitudinal Study (NEILS) focuses on children (ages zero to three) with or at risk for disabilities. The researchers collected data on early intervention services that the children received and other key factors affecting their lives.Data Mining is a range of processes of extracting hidden predictive information from large databases. Cluster Analysis is one of these processes that helps one see clumping patterns in the data.This talk will describe cluster analysis and the results we found by applying the technique to the NEILS database. The content of this talk should be fully accessible to all undergraduate students regardless of major.

Applications of Biochemistry

Frazier Jelke B, 3:00 pm – 4:00 pm
Session Chair, Sara Gremillion, Department of Biology

3:00-3:15

Epigenetic mechanisms may provide an adaptive regulation of the genetic repertoire in Arabidopsis thaliana

Maria Cartagena

Faculty Sponsor: Jonathan Fitz Gerald, Department of Biology

Paternal genomic imprinting (PGI) results in the silencing of either the paternal or maternal allele of a gene after fertilization. In Arabidopsis, PGI is regulated in part by the activity of conserved Polycomb group (PcG) histone methyltransferases. We have observed that variation of seed size in three naturally occurring Arabidopsis ecotypes may be regulated by PcG or a similar epigenetic mechanism. Seed sizes derived from reciprocal crosses between Landsberg erecta (Ler), Columbia (Col) and C24 strains correlated more strongly with the choice of parent than the resulting genotype of the seed itself, suggesting regulation by PGI. We hypothesized that these epigenetic differences between lines might contribute to adult traits. Flowing time is epigenetically regulated and involves PcG activity. When Col or Ler plants were crossed with C24, the onset of flowering was delayed for as long as 2 months compared to parental strains. Features of these non-flowering plants included a curly leaf morphology that resembles plants deficient for vegetative PcG. We propose that in addition to evolution through DNA mutation, epigenetic selection of PcG target genes represents a short term, and possibly reversible, adaptive strategy employed by recently separated population exposed to distinct environments.

3:15-3:30

ROP2 GTPase is required for proper Atfh5 localization in Arabidopsis thaliana

Jenkin Chan

Faculty Sponsor: Jonathan Fitz Gerald, Department of Biology

Formins are conserved actin-nucleating proteins that are involved in cytokinesis and cell polarity. In yeast and animals, formins are localized and activated by the binding of Rho GTPase. However, canonical Rho GTPases and the required formin binding domains are not apparent in plants, so the regulation of plant formin is currently not well understood. In this study, we examine the genetic interaction between the Arabidopsis thaliana formin, AtFH5, and candidate regulators. In the wild-type plant, Atfh5-GFP fusion protein is well-packed and is centralized slightly below the end of a growing pollen tube. Moreover, during a root elongation, Atfh5-GFP is localized on the surface of the root tip. In the absence of ROP2, a plant GTPase protein, Atfh5-GFP fusion protein is diffused at the end of a growing pollen tube; and is absent from the very end of the root tip. These results suggest that ROP2 GTPase participates in regulating Atfh5 during the developmental process. Though plant formins lack the conserved GTPase binding domains they may retain association with the same regulators found in animals and yeasts.

3:30-3:45

THI73 dependent activity of the S.cerevisiae G1 cyclin Cln3

Jacquelyn Hancock

Faculty Sponsor: Mary Miller, Department of Biology

The cell cycle is the highly regulated process by which a cell grows, replicates, and divides into two daughter cells. In S. cerevisiae, cell cycle initiation or passage through “Start” in the Growth 1 (G1) phase requires the G1 cyclin, Cln3. During G1, Cln3 binds and activates the cyclin-dependent kinase, Cdc28. The Cln3-Cdc28 complex supports cell cycle progression by allowing the transcription of necessary genes. Activity of the Cln3-Cdc28 complex is provisional on its RAN-dependent movement into the nucleus. A C-terminal bipartite type nuclear localization signal (NLS) is required for proper transport. Using a GFP reporter system, sixteen of seventy-nine genes screened were identified as important for movement of GFP tagged Cln3 NLS into the nucleus. Of these sixteen, eight show full-length Cln3 functional defects. One of

these genes, THI73, is implicated as a trans-membrane protein based on sequence analysis. Data from viability assays support the idea that THI73 is important for full-length Cln3-dependent viability. Since a defect in Cln3 function is seen in the absence of THI73 and since the absence of THI73 causes a Cln3 NLS defect, we hypothesize that Cln3 is not functioning appropriately because Cln3 does not enter the nucleus properly in the absence of Thi73.

3:45-4:00

GDP-Mannose Transporters in the filamentous fungus Aspergillus nidulans

Laura Johnson, Chassidy Groover
Faculty Sponsor: Loretta Jackson-Hayes, Department of Chemistry, Terry Hill, Department of Biology, and Darlene Loprete, Department of Chemistry

GDP-mannose transporters (Gmt) carry nucleotide sugars from the cytosol across the Golgi apparatus membrane in various eukaryotic organisms including plants and a variety of fungi. Some fungal species including Saccharomyces cerevisiae express a single Gmt, while others including A. nidulans express two (GmtA and GmtB) whose individual roles have not been revealed. GmtA displays a punctate pattern of distribution indicative of localization within the Golgi apparatus. Here we show that GmtB localization is congruent with GmtA in mature hyphae. Also, in the lab created mutant, R205, there is a mutation in the coding region for the GmtA gene. Separate plasmids containing GmtA and GmtB as well as plasmids that encode for GmtA-GFP and GmtB-RFP chimeras complement the mutant phenotype of R205 which includes hypersensitivity to the chitin-binding agent Calcofluor White. However, GmtA and GmtB constructs complement the mutant with differing potencies. Therefore GmtA and GmtB appear to perform closely related, but distinct tasks in cell wall integrity of A. nidulans.

SOCIAL SCIENCES ORAL SESSSIONS

Research Within International Studies

110 Buckman, 11:00 am – 12:00 pm
Session Chair - David Romano, Department of International Studies

11:00-11:15

Ethnic Separatism: Cause and Success

Cody Behles
Faculty Sponsor: David Romano, Department of International Studies

This paper tests a new theory which offers a plausible explanation for when ethnic groups will attempt to secede from a larger multinational state. The experiment tests for two independent variables, ethnic majority and ethnolinguistic majority. An intervening variable of central state interests and power helps explain cases where a separatist group will be stifled by serious repression. The former USSR presents an ideal test case for the theory in question. In addition to using nearly all of the active separatist groups in the former USSR I also treated the CIS and Baltic States as separatist groups, using the data from the 1989 census. In all cases I found that when both ethnic and ethnolinguistic stateless majorities existed the groups either separated, are currently attempting to separate or were repressed by extensive use of military force. Other cases involved separatist groups lacking either ethnic or ethnolinguistic majorities (or both) in their administrative districts, resulting in failed separatist projects that did not even necessitate the use of repressive force from the central government. Although this study limits itself to the territories of the former Soviet Union, the theory itself should remain applicable across the entire spectrum of separatist movements worldwide. Anecdotal analysis appears to confirm the theory's applicability to cases such as Kosovo, Palestine, and Kurdistan.

11:15-11:30

Renewing Choked Societies with Sustainable Retro-development

Brennan Lowery

Faculty Sponsor: Jennifer Sciubba, Department of International Studies

I intend to present my research on environmentally sound urban community development from last fall. The topic is sustainable retro-development, a term I use to describe the process whereby communities pool their social and physical resources together in a common forum in order to improve their surroundings in ways that are beneficial to the natural environment. Such organizations arise in response to human and environmental needs that the current flaws of developed urban society have led to. These organizations, I argue, first effect positive change in their immediate surroundings, but lead towards an overarching revision of society. A flowering of green development has begun in exceptional cities and countries, like Seattle or Germany, but I am concerned with the need to bring those successes to societies that lack their fortunate history with environmental issues. I will discuss several of these organizations in Memphis and explain how they are achieving sustainable retro-development in their initiatives. The organizations I studied include a recycled bicycle cooperative, a network of organic community gardens, and a grassroots planning and development organization. These organizations, and Memphis as their terrarium, serve as a sample of the development that is capable of growing in a city.

11:30-11:45

India: At the Crossroads of Growth and Environmental Disaster

Arijit Paul

Faculty Sponsor: Jennifer Sciubba, Department of International Studies

Is it possible to have economic development while sustaining the environment? The developing world today faces two critical stresses. Ballooning populations are demanding economic uplift. At the same time, the increasing industrialization and mismanagement of resources in states have created a global environmental crisis of epic proportions. Furthermore, these stresses tend to conflict, since economic growth is usually accompanied by environmental degradation. Given this cleavage, the world's states are faced with grave threats and must respond with efficient policies that can create economic opportunities but are able to preserve an increasingly fragile environmental balance. The case of India is particularly relevant to the study of environmentally sustainable economic growth. India has recently enjoyed strong economic growth yet is stressed to the limit by a burgeoning population exacerbated by dwindling resources. Yet India's growth, sponsored by a booming knowledge economy, has the unique opportunity to create "green" development. Furthermore, India's status as the world's largest democracy presents unique benefits as well as incredible challenges. But is environmentally sustainable development possible? India and the world can simply not afford any other option. To move forward in an environmentally sustainable way, India must use every resource at its disposal. By focusing on education, extending information technology to rural areas, exploring innovative environmental solutions based upon the country's knowledge economy foundations, investing in green technology and infrastructure, incentivizing green business practices, creating a strong and protective legal framework, and encouraging sustainable consumption practices amongst the nation's citizens, India can and must overcome the environmental challenges that threaten to destabilize the country's future.

11:45-12:00

Eco-Authoritarianism: The Commons and Its Need for Technocracy

Derek Washam

Faculty Sponsor: Jennifer Sciubba, Department of International Studies

The purpose of this paper is to provide an alternative to the majority of green political theory, which is dependent on democratic ideals. Democracy is not a synonym for sustainability. Many democratic countries, such as the United States, have contributed to the environmental degradation that we are witnessing today. By examining how and why democratic regimes contribute to environmental destruction, we can assess what alternatives authoritarian leadership can provide. This work uses both theoretical and concrete evidence to illustrate that authoritarianism could be the answer to the environmental crisis by exploring the issues of the tragedy of the commons, social contract, and the need for coercion. Singapore

and China both provide strong evidence that authoritarian regimes can more effectively implement environmental policies than democratic ones. These countries' road tax and policies offer specific proof that coercion and strength can change the destructive habits of a nation's citizens. These findings show that we must broaden our political thought as we seek solutions to the environmental problems that we have created.

Ethnographers and Sociologists at home and in the Field (I)

212 Buckman, 11:00 am – 12:15pm

Session Chair – Carla Shirley, Department of Anthropology & Sociology

11:00-11:15

Being Deaf: A Way of Living or A Way of Life

Mary Dumas

Faculty Sponsor: Carla Shirley, Department of Anthropology & Sociology

Being hard of hearing or deaf can be seen as a disability by some people and embraced as an identity by others. These differing viewpoints can create conflict when deciding how to raise or treat a child who is deaf. Through conducting in-depth interviews with the parents of deaf children and professionals (speech pathologists, teachers, and counselors) who work with deaf children, the purpose of this study is to examine how these adults shape deaf children's socialization and identity construction. Specifically, this study utilizes symbolic interactionism to examine the factors that might frame the decision-making of the parents in how they raise their children and of the professionals in how they choose to recommend certain plans of action over others, for example, regarding styles of communication and medical interventions. During a time when there is a perception that one must have a "normal" body or must do everything from surgery to a change in lifestyle to achieve this goal, these parents and professionals must decide whether being deaf is an imperfection that needs to be "fixed."

11:15-11:30

Synthesizing Two Educational Traditions: Pedagogical Discourse in Light of Political Correctness

Rami Abdoch

Faculty Sponsor: Carla Shirley, Department of Anthropology & Sociology

There is a growing need to develop a pedagogical approach that both realizes the variety of thought in the college community yet seeks actual progress as opposed to superficial progress. This is important due to the recent trend in colleges nationwide that sees diversity and societal pluralism as just reasons for altering the politics of discourse in general. In other words, academia insists on using politically correct language to manufacture progress. For example, why is the term African-American used instead of black? Why is the default stance on homosexuality one of acceptance and all opposing claims rendered invalid? These concerns are what drive me to call into question what is deemed a modern liberal education. I will establish the theoretical grounding necessary to develop a synthesis of these two approaches by referring to "Pedagogy of the Oppressed" and "Closing of the American Mind" among other works. The language of political correctness in tandem with the authority of "the professor" and the administration in the college environment generally poses a roadblock for such discussion. By explaining how and why the traditional liberal approach shifted to the modern liberal approach and synthesizing the two, it is possible to create an alternate approach to education that can make sense of difference without sacrificing social progress.

11:30-11:45

Does being Responsible Matter? An Examination of the Corporate Social Responsibility – Financial Performance Link

Leslie Elmore

Faculty Sponsor: Carla Shirley, Department of Anthropology & Sociology

With a decrease in resources and a global economic crisis, there is an increasing demand for corporations to become more responsible to the environment, communities, employees, etc. However, a firm's main objective is to make profits, leading many to wonder whether socially responsible policies can be economically beneficial to a company. Some research argues that corporate social responsibility (CSR) offers a competitive disadvantage because the firm is incurring costs that might otherwise be avoided. However, some scholarship cites that an increase in a company's social responsibility will help to increase its financial performance by reducing explicit costs. In order to examine the empirical linkages of CSR and financial performance, this study analyzes and compares the social and financial performance of a CSR Mutual Fund and a Large Capital Mutual Fund, with a focus on the banking industry. The degree of CSR is measured through content analysis, while financial performance is determined through accounting-based measures over an eight year period. In the midst of an economic and resource crisis, corporations need to focus on making profits in addition to becoming more responsible; thus, it has become increasingly important to examine whether companies are able to be profitable by being responsible.

11:45-12:00

The Intersection of Cultures: An Examination of Memphis After-School Programs

Erin McKinney

Faculty Sponsor: Carla Shirley, Department of Anthropology & Sociology

Because of our country's history with racial prejudice and the continued racialization of the public school system, there remains an achievement gap in the educational sector along racial and class lines: minority children of lower socio-economic statuses consistently demonstrate lower academic achievement than white middle and upper class children. Numerous after-school organizations have been created with the purpose of combating this educational gap by imbuing disadvantaged children with academic self-esteem. The purpose of this study is to examine how race, class, and other socio-cultural factors play a role in the after-school educational setting. This study analyzes the content of the Boys and Girls Club and the YMCA's mission statements and training materials in order to determine how these organizations prepare their employees to help disadvantaged children. Through in-depth interviews with adults, this study gages personal and professional perceptions of how these social factors affect their approach to engaging the student. These findings have implications for the type of individuals that should be recruited to work in after-school programs as well as implications for how volunteers and administrators should be trained before interacting with a child in this setting.

12:00-12:15

Black on White: Black Faculty and Student Affairs Practitioners at a Predominantly-White Institution

Cordarius Mclean

Faculty Sponsor: Carla Shirley, Department of Anthropology & Sociology

Most studies about racial minority populations on predominately-white campuses examine only students' experiences. Even our own campus climate has typically been represented by students' feelings and attitudes. This study suggests, however, that professionals have experiences and, thus, feelings and attitudes of their own that should be explored. Through an online survey and follow-up in-depth interviews, this study investigates, analyzes, and presents the thoughts, feelings, and attitudes of black faculty and student affairs practitioners by exploring how they experience their jobs on a predominantly-white campus. Looking specifically at employees of Rhodes College, this study assesses how black professionals perceive and understand the role and function of race in their personal identities, their professional trajectories, their working relationships with colleagues and students, and their perceived impacts on the predominantly-white campus and, conversely, the impact of the predominately-white campus on them.

Ethnographers and Sociologist at home and in the Field (II)

212 Buckman, 1:00 pm – 4:15 pm

Session Chair - Susan Kus, Department of Anthropology & Sociology

1:00-1:15

Heart and Hospitality: Community Development through Volunteerism at Caritas Village

Rami Abdoch

Faculty Sponsor: Susan Kus, Department of Anthropology & Sociology

The ethnographic method seeks to highlight in-depth patterns of meaning through conscious observations of social phenomena. Such phenomena are understood through participant observation in which the researcher attempts to balance being both an outsider of the culture, and an insider that tries to understand the logic behind the activities therein. My study was conducted at Caritas Village, a café and community haven for residents of Binghamton, a low-income neighborhood in Memphis, TN. Speaking and interacting with people at Caritas Village facilitated an understanding of its relationship to Binghamton and uncovered various ways in which Caritas Village incorporates the neighborhood of Binghamton. This was illustrated partly by the way space and material objects are used in tandem with the activities that take place such as knitting, photography, chess, etc. The "physical" elements of the site very much feed into the "social" Caritas Village that fosters hospitality and combats financial and crime-related problems. Despite having to deal with the realities of subjective interpretation, the ethnographic method is one that is crucial to understanding how these different elements form what seems to be an inseparable bond between the actual, physical neighborhood of Binghamton and social community of Caritas Village.

1:15-1:30

The Rhythm of Dance: An Ethnographic Study of Hip-Hop at the New Ballet Ensemble and School

Wesley Campbell

Faculty Sponsor: Susan Kus, Department of Anthropology & Sociology

There exists a culture that bonds people together within many organizations. The culture of the group of people tells a story of the culture's lived reality, opening the outsider's eyes to this other complex way of life. Through the ethnographic method of participant observation, I have had the opportunity to experience another cultural scene through my time spent at the New Ballet Ensemble and School, a fairly new dance organization in the Memphis community. Throughout the semester I immersed myself in this culture to further my overall understanding and appreciation of the organization and the meaning that it holds for the individual dancers. New Ballet Ensemble and School allow every dance student within the Memphis community the opportunity to take dance classes in a professional dance environment, regardless of their financial capabilities. During my time spent with the organization I focused my attention on the rhythm, both literal and figurative, found in the student's dance, and the way in which that rhythm connects the individuals to each other to form a cohesive unit.

1:30-1:45

Humans on Exhibit: People-Watching at the Memphis Zoo

Lindsay Chaisson

Faculty Sponsor: Susan Kus, Department of Anthropology & Sociology

Every scientific discipline, whether natural or social, employs its own tried-and-true research techniques. In anthropology, the foundation of research is the ethnographic method, which is based on the process of participant-observation. This semester I used the ethnographic method to study the culture of the Memphis Zoo. The zoo may seem like an unusual place for a study in anthropology, which by simple definition is the study of humankind; however, my research focused not on the real stars of the zoo, the animals, but instead on the people involved: the caretakers and the visitors. People tend to have differing opinions about the concept of zoos in general—some think of them as animal sanctuaries, others as animal prisons, and others as just another form of entertainment. I spent time observing and talking to both zookeepers and zoo

patrons to investigate their reactions to, interactions with, and feelings toward the animals at the Memphis Zoo.

1:45-2:00

Red, Pink, Purple, and all the many shades of nail salons: An ethnographic study of Fancy Nails salon.

Meredith Fifer

Faculty Sponsor: Susan Kus, Department of Anthropology & Sociology

The practice of participant observation allows anthropologists to actively participate in the culture they are studying, which creates a better understanding of that culture. This semester I have engaged in an ethnographic study of the culture found within nail salons. I have used the method of participant observation to collect data of the nail salon culture, and have formed hypotheses. From my experience at Fancy Nails, I have discovered that when getting manicures, customers with no prior relationship to each other feel a certain level of comfort, and will divulge intimate details of his or her personal life. It is only through the practice of my ethnographic investigation and participant observation that I have been able to deduce this cultural aspect of clientele relationships found within Fancy Nails.

2:00-2:15

Brutes, Bruises, and the Memphis Blues: An Ethnographic Study of Memphis Rugby

Andrew Hammond

Faculty Sponsor: Susan Kus, Department of Anthropology & Sociology

The ethnographic method allows for one to become immersed in a culture in order to better understand that culture's way of life. Becoming a "participant" in a foreign culture or cultural scene is one of the most powerful learning tools an anthropologist has at his or her disposal. It can be a tremendously challenging task, but it is a task that I undertook over the course of this semester. For the last four months I have been a member of the Memphis Blues Rugby Club in order to better understand the cultural scene of a rugby player. Becoming a full participant of the Memphis Blues has been an extremely painful experience; however, it has also been one of the most gratifying experiences of my entire life. My study attempts to depict the lifestyle of a rugby player and strives to explain the context of the game itself. While my study analyzes the sport and those who play it, it also shares my own personal story of how I developed a love for this game and became a true Memphis rugby player.

2:15-2:30

A Slice of Ethnographical Cheesecake

Joy-Katherine Martin

Faculty Sponsor: Susan Kus, Department of Anthropology & Sociology

This semester, I did ethnographic research at The Cheesecake Corner located on 113 GE Patterson Avenue, Memphis, Tennessee. My study focuses on the culture of cheesecake: the dessert itself, the establishment, and the participants. My research began by closely observing the customers and workers at the bakery. This process of observing for the sake of description and question formation is an important part of the ethnographic method. After watching, I began to interact with some of the customers and ask the questions my observations led me to ask. In truth, it is harder to study one's own culture because the "naturalness" of it usually causes one to take key aspects for granted. This study forced me to question dessert as a sign of the excess of food, obtaining food from a place besides the home or in a garden, and the differences between The Cheesecake Corner and other places that specialize in the famous dessert.

2:30-2:45

Between the Stacks: An Ethnography of the Benjamin L. Hooks Central Public Library

Bridget McCall

Faculty Sponsor: Susan Kus, Department of Anthropology & Sociology

Built in 2001 by the city, the Benjamin L. Hooks Central Public Library at 3030 Poplar Ave. defines itself as a "public" space. It is Memphis' library, yet to what community does it cater and what community does it foster? To understand the culture of the public library, I employ the ethnographic method, experiencing as a participant observer the atmosphere cultivated in this public space, the interactions that take place here, and how the experience of the public library's culture both is shaped by visitors, employees, and volunteers and how the culture shapes the experience of visitors, employees, and volunteers. The space is very purposefully designed to cultivate a certain culture of openness, "enlightenment," a tradition of progress, shared resources, dialogue with other persons and ideas present within the resources of the library, and community—a culture that recreate itself according to those within it. In my presentation I will delve deeper into the way that both the structures of the library (the physical composition, the resource system, and the staff organization) and the individuals within the library inform and are informed by the central public library's culture.

2:45-3:00

Coffee Pots and Copy Machines: An Ethnographic Study of the Lester Elementary Teacher's Lounge

Erin McKinney

Faculty Sponsor: Susan Kus, Department of Anthropology & Sociology

Traditionally used by anthropologists, ethnography is the conscious and intentional decision to immerse oneself in another culture in order to come to an understanding and appreciation of how the members of that society experience reality and meaningfully construct their world. Conducted in foreign societies among indigenous peoples or in corners of our community that often go over-looked and under-appreciated, ethnographies help us to understand alternative ways of experiencing the world and recognize our own way of life as only one option among many. Ethnographies teach us to contextualize our particular social location within the global community and appreciate others' solutions to universal experiences. This semester I engaged in the ethnographic method in the teacher's lounge at Lester Elementary, an inner-city school serving disadvantaged children in Memphis, Tennessee. My time there revealed that the teacher's lounge is more than merely a place to sit and drink coffee during break times; it provides a meaningful space in which adults at the elementary school come together to demonstrate community solidarity and find a brief repose from the challenges they daily face in the classroom. In a society that exalts the individual and values autonomy, the teacher's lounge at Lester gives a glimpse of the inter-connectedness and inter-dependence of community members.

3:00-3:15

The Tell-Tale Tan: An Ethnography of Tanning Trends

Kathryn Sella

Faculty Sponsor: Susan Kus, Department of Anthropology & Sociology

Ethnographic fieldwork allows anthropologists to explore different cultural scenes and to educate others about those scenes. For this particular study I chose to situate myself as a participant-observer within a local tanning salon. There is much to be learned about the interworkings of the tanning society. Since beauty is in the eye of the beholder, each culture has its own ideas of what it means to be beautiful. For some in the American society, going to the tanning salon has become a ritual which makes one feel more beautiful. Beyond this reasoning, I wanted to explore other reasons Americans tan and the justification behind the tanning industry. I chose one large and easily accessible salon from a popular tanning chain with many other salons located throughout the mid-South. The salon aids customers in bronzing their bodies in moderation through different levels of tanning beds and spray-on tans, or "mystic tans". In this study I address the male to female ratio of customers as well as the stereotypes sometimes associated with tanning, such as customers who become "tan-aholics".

3:15-3:30

The Peabody: An Ethnographic Study of Memphis' Historic Hotel

Catherine Smith

Faculty Sponsor: Susan Kus, Department of Anthropology & Sociology

The ethnographic method enables social scientists to immerse themselves completely within another culture, while at the same time, confronting any preconceived notions or stereotypes that may already exist. In the field, the researcher's previous ways of thinking, or "ethnocentrism", may be challenged and, as a result, we are able to expand our knowledge and make more informed choices in our lives. The most effective method that exists in ethnographic fieldwork is participant observation because it allows the researcher not only to make casual observations of the culture, but also to participate and take on an active role within it. After engaging in participant observation inside The Peabody Hotel, located in downtown Memphis, my stereotype of the hotel has been completely altered. I previously viewed The Peabody as just a regular hotel that was not particularly noteworthy, not realizing that I was blind to the historical and cultural significance that it held for people inside and out of the Memphis community. As a result, my research study explores what the historic Peabody Hotel means to various groups of guests, staff/employees and tourists, and how the material culture, or the environment of The Peabody Hotel, changes in response.

3:30-3:45

Circling Memphis: A Passenger's Social Study of City Buses

Armanda Venezia

Faculty Sponsor: Susan Kus, Department of Anthropology & Sociology

What do you see when passing a city bus on the street? What impressions does it give? Who is riding? Who is driving? The bus system does not have a favorable reputation in most social circles around Memphis. This semester I studied city buses and their passengers in order to explore these questions and to understand why public transportation is viewed so negatively in Memphis. Ethnographic research is a very involved method of study in anthropology that brings a researcher as close as possible to the cultural scene in question. By becoming a participant observer on the bus, I was able to connect with fellow passengers and draw observations of my own. My study focuses on the rhythm and atmosphere of the bus, using its material, physical, and social components to put together a detailed narrative of the scene. Riding the bus has provided me with a first-hand account of why the system is viewed so negatively, especially highlighting the connotations involved with not having one's own transportation and the signs of poverty abundant on the city bus.

3:45-4:00

Without Pattern: The Deliberate Eclectic-ness of Café Eclectic

Chelsea Wakstein

Faculty Sponsor: Susan Kus, Department of Anthropology & Sociology

At the cornerstone of anthropology is the practice of ethnography. Ethnography is a study that allows anthropologists to receive a deeper understanding of a specific culture through participant-observation. I have chosen to conduct an ethnographic study at Café Eclectic, a local, independently owned coffeehouse located in Midtown Memphis, Tennessee. Memphis residents find refuge in this café, whether it be to get work done or to enjoy a delicious sandwich. This mass flocking to Café Eclectic sparked my interest and has guided my research. Cafés around the world house people from their office or house and offer a comfortable, home-like feel that can satisfy a customer's various desires. Different from large coffeehouse companies, Café Eclectic has personality that is rooted in its name. Showing no pattern whatsoever, the café has deliberately displayed artwork of different styles, a creative and assorted menu, a collection of unmatched silverware, and a diverse group of workers.

4:00-4:15

The Mall Not For All…An ethnographic look at Southland Mall.

Kendral Ellison

Faculty Sponsor: Susan Kus, Department of Anthropology & Sociology

Doing ethnographic fieldwork of another culture is a great way to experience and learn about a culture first hand. By being a participant observer ethnographers are able to go beyond what is learned from texts and learn by becoming a part of the culture. Taking the role of a participant observer at Southland Mall has enabled me to realize and understand aspects about a mall that never seemed relevant to me. I have never seen the mall as a cultural scene until now. The entire atmosphere at Southland Mall has a cultural sense that is hard to overlook. From the music playing throughout the mall to the names of the individual stores, everything is culturally represented. Southland Mall seems to have an even balance in that, it is a place for shopping and hanging out. The community sees this mall as more than a place of business, but also as a cornerstone and historical marker for their culture. My study focuses on how Southland Mall functions in other ways besides being a typical shopping mall, but mainly focuses on the ways in which the mall seems to cater to a certain culture or group of people.

Buckman Scholars

110 Buckman, 1:00 pm – 2:15 pm

Session Chair – Stephen Ceccoli, Department of International Studies

1:00-1:15

The Eternal City: A Semester in Rome

Armanda Venezia

Faculty Sponsor: Stephen Ceccoli, Department of International Studies

Last fall I studied abroad in Italy as part of the Buckman scholarship program. Four months in Rome have completely changed the way I see, understand, and appreciate the world as both a complex and rewarding place. My time in the eternal city, living in a neighborhood also housing the Pantheon and Piazza Navona, still seems like it was a dream. In this presentation, I will take you through my time in Italy, highlighting our programmed excursions, my academic classes, and my observations of the greatest city in the world.

1:15-1:30

Deconstructing The Magic Behind A Powerful Story

Christina Cooke

Faculty Sponsor: Stephen Ceccoli, Department of International Studies

While abroad last fall, I studied Creative Writing at the University of East Anglia in Norwich, England under Dr. Trezza Azzopardi, an award-winning author whose work has been shortlisted for awards such as the Booker Prize in Literature and the James Tait Black Memorial Prize. Throughout the semester, I gained a greater mastery over the mechanics of writing short fiction, such as methods of representation, ways to manipulate language, and utilizing various point of views in order to best benefit the story being conveyed. Using short samples from authors such as Jeffrey Eugenides, Anne Enright, Graham Greene and Jay Mcierney, I will showcase various aspects of constructing a successful story and then offer a sample of my own writing so as to highlight the ways in which these authors have influenced my personal style.

1:30-1:45

What the EU Can Do for You: The Benefits for Citizens of the European Union

Alison Goostree

Faculty Sponsor: Stephen Ceccoli, Department of International Studies

After centuries of brutal wars, the countries of Europe made the monumental decision to come together as a single community in 1951. From its earliest days as the European Steel and Coal Community, the European Union has striven to provide peace and stability while creating a globally competitive and united

market. Currently comprised of 27 member states, the EU is still expanding today. By becoming a member of the EU, a state guarantees to its citizens the benefits of free travel and trade in any member state, the promise of justice outside their home countries, and the promotion of education and cultural awareness. The impact of these objectives can be clearly seen by the average citizen of the European Union or even a traveler visiting EU countries for the first time. As it continues to grow, the European Union will work hard to find innovative ways to promote freedom, solidarity, and fairness in and among each of its member states.

1:45-2:00

The Return of Salvador Allende

John McGeoch

Faculty Sponsor: Stephen Ceccoli, Department of International Studies

Over the past four decades the Chilean government has undergone several dramatic transformations as the country experienced the socialist style government of Salvador Allende, a military coup and the subsequent military dictatorship of Augusto Pinochet, an electoral referendum and the restoration of democracy. The political image of one of Chile's most famous leaders, Salvador Allende, has undergone significant changes. Although considerably unpopular at the time of his death during the military coup of 1973, Allende has become one of the most popular figures among the Chilean left and risen to almost mythical status for much of Chile's youth. Additionally, Allende's image is an important symbol throughout the country with statues, banners and t-shirts appearing in many public places. The popularity of Allende among Chilean young people highlights a critical generational divide when compared to many older Chileans who view Allende as a symbol of economic difficulty and divisive politics. Consequences of generational differences appear in all areas of Chilean politics but are most evident within the academic community where students rally to images of Allende during student protests and strikes.

2:00-2:15

Buckmann Perpectives: Life and Travel in St. Petersburg

William Montgomery

Faculty Sponsor: Stephen Ceccoli, Department of International Studies

I lived in St. Petersburg Russia for several months last year and experienced first hand some of the amazing changes that the city and country are going through. St. Petersburg, Russia is a city being pulled in new directions while in many was remaining like it was in much of the 20th century. My time spent in St. Petersburg has revealed much of the new changes. New money from high oil prices has created new wealthy class of Russian businessmen. However, the average Russian still lives a lifestyle similar to what Russia was in the nineties and the Soviet Union. I lived with a Russian family in downtown St. Petersburg and traveled to school every day on public transportation. I rode the public transportation in desperate need of renovation. Russia is experiencing renovations all over the city as the government tries to present it as the modern European city that Peter the Great envisioned. Much of the city was neglected during the Soviet period and it is only now that the architecture of the Tsarist period is getting the attention it deserves. I lived only blocks away from the first building in St. Petersburg; Peter and Paul fortress on the banks of the Neva. Russia is also experiencing new social trends. For the first time in its recent history Russia is experiencing immigration and with it foreign religions and cultures that come with it. St. Petersburg's Blue Mosque was only next door and it was packed at the beginning of Ramadan. Russian Orthodoxy is also receiving a revival in popularity. My host mother went to church with her daughter every Sunday, and new churches are being built while old ones are being restored. Even young Russians are flocking back to Orthodoxy after the prohibition of religion in the Soviet period. Even western consumerism has hit Russia. giant malls with indoor water features are cropping up and help to make Russians one the biggest consumers in Europe. These are only some of the fascinating trends I experienced first hand while living in St.Petersburg as the country is suspended between new and old, east and west.

Studies of Education, Discrimination, and Social Responsibility

110 Buckman, 2:30 pm – 4:00 pm
Session Chair – Julie Steel, Department of Psychology

2:30-2:45

Honor Code Violation Severity and Harshness of Punishment: From the Archives to the Laboratory

Kelly Coney, Jesse Cavett, Sean Jacobs, Lindsey O'Hare and Alanna Topps
Faculty Sponsor: Julie Steel, Department of Psychology

The Rhodes Honor System is an integral component of the college community, guiding students in terms of the college's expectations for their honorable educational pursuits. A system designed to instill, encourage, and protect student integrity necessitates that the greater community hold it in high esteem and view the system as fair and legislated appropriately. A community governed by an honor system must believe 1) that the council's handing down of punishments is consistently fair/just and 2) punishments are sufficiently punitive in order to deter future violations. The psychological literature on justice-seeking presents a framework for assessing student perceptions of the Rhodes Honor System. To this end, we have conducted three studies in order to better understand student perceptions of honor code infractions and punishments. We first conducted an archival study of Sou'Wester reports of honor infractions from 1974-2006. We coded the available data and analyzed for the frequency of five violation types (as outlined in the student handbook) and assessed punishment type. A second study was conducted in order to assess current students' beliefs about the relative severity of the five types of violation. Finally, an experimental study is currently underway assessing students' beliefs about appropriate punishment for hypothetical violations. Results will be discussed.

2:45-3:00

How Schools Overcome Tragedies

Gerri Diamond
Faculty Sponsor: Mark Smith, Department of Education

For my senior capstone experience in Education, I have chosen to spend the semester researching how high schools overcome tragedies. From car accidents to suicides, from family disturbances to drug abuse, my research has allowed me to get an inside look on school counseling at the high school level, with a focus on the role community plays in the school setting. In completing my research, I have been able to speak with high school counselors at three locations: Ms. Jennifer Billett at Houston High School, Ms. Linda Toombs at Briarcrest Christian School, and Mr. Jeff Blancett at Christian Brothers High School. I have also been able to speak with Mr. Dennis Reynolds, the head of the counseling department at Walter Johnson High School, my alma mater. I have taken a lot of information out of speaking with Dr. Janet Panter of the Rhodes College Psychology Department, a school psychologist who was active in writing the Shelby County Schools Crisis Report Manual. This document, along with my personal school experiences and the experiences I have been able to learn about from the aforementioned school counselors, has fueled the direction in which I have decided to take this research project.

3:00-3:15

Introduction of Multicultural Awareness at Springdale Elementary School

Alexandria Eiland
Faculty Sponsor: Patrick Shade, Department of Philosophy

In a practicum for Spring 2008's section of Philosophy of Education, service projects were developed in response to the need to apply the theories and postulates observed in the studies of various philosophers' writings on education. Appealing to E.D. Hirsch's conception of cultural literacy as being knowledgeable and acknowledgeable of one's own rich cultural compositions and using this as a springboard towards the acceptation of those foreign, a Multicultural Fair was proposed for the purpose of introducing a new range of cultures not represented in the populous of Springdale's student body, but prevalent on both the world stage and that of Memphis, Tennessee. As a volunteer at Rhodes' adopted school, Springdale Elementary

School, I was given the opportunity to bring the Multicultural Fair to their campus. Representatives from Rhodes College student clubs and organizations created poster boards and visual, tactile displays in which to present their culture, or one they had indicated interest in, to the entire Fifth grade at Springdale. In this presentation, I will discuss my experiences with organizing such an event with peers, the educational benefits of this introduction, the importance of the age of the participants and what lessons we learned about our success from the students' responses.

3:15-3:30

What Went Wrong: A Failed Attempt at Education Reform and the Insights it Revealed

Jennifer Gaffney, Mark Wadley and Brendan Keegan
Faculty Sponsor: Patrick Shade, Department of Philosophy

Over the past three semesters, we have been working with the Refugee Empowerment Program (REP). REP is a tutoring organization designed to help those seeking refuge from war torn countries in Africa acclimate themselves to the American school system. Our goal in working with this organization was to instigate several changes that would better equip tutors to handle some of the unique educational challenges refugees face. After spending a semester tutoring and several months researching, we attempted to develop a system that would provide tutors with the training they need to be effective in this unique educational environment. Due to various practical constraints and frustrations, however, the project fell apart. The end result was no doubt disappointing. However, we think our lack of success reveals significant insight into problems inherent in the structure of our education system, particularly with respect to its capacity to be reformed. Moreover, it reveals insight into why those interested in instigating change often fall short. Our aim in this paper is to explore why we failed. Many of the problems we faced appear to be systemic and in exposing them, we think it is possible to more accurately identify the source of those problems and offer ways to realistically approach education reform.

3:30-3:45

Philosophy of Education Practicum: Breakthrough Collaborative

Lacey Hudspeth, Eric Stradley, and Cal Lee
Faculty Sponsor: Patrick Shade

For the past two semesters Cal Lee, Eric Stradley, and Lacey Hudspeth have been participating in a Philosophy of Education practicum, whereby we work to implement practical educational changes for the Memphis community. Our project specifically has been to work on establishing a permanent chapter of the nationally accredited program, The Breakthrough Collaborative. This program brings college students in to teach middle school students, thus serving a dual purpose: it promotes education as a field of study and as a professional degree and it also bridges the age gap between student and teacher, thus more easily engaging the students. Our presentation will focus on an extensive discussion of the program, why the Memphis community is a good fit for this program, and the bureaucracy and other external quandaries that our team has faced this year. We will evaluate the different sets of hindrances to the start of our project in the sense that although we have great aspirations and have worked hard to implement this project, we still do not have a firm contract to begin the project.

3:45-4:00

Everyone's Growing Older: An Exploration of Aging and Ageist Attitudes in the United States

Sarah Eldridge and Stephen Rintoul
Faculty Sponsor: Christopher Wetzel, Department of Psychology

Aging is universal and in today's society there are increasing trends that tell people they need to act younger, feel younger, and most importantly look younger. As the baby boomer generation grows older and the life expectancy increases, our society has more elderly people than ever, and it is important to examine the relationships between the younger and older generations. Past research has indicated that ageism, or discrimination against people based on their age, is a widespread and growing problem that is

commonly unrecognized. We will examine the following questions: 1) how and why age stereotypes form, 2) how valid these stereotypes are, and 3) to what extent these stereotypes are harmful. Today, people seek a fountain of youth that has transformed promises of living forever into promises of looking and feeling younger, because natural aging processes are portrayed as undesirable in today's society. In light of this, we will consider how the perception of aging and attitudes toward the elderly have changed over the last few decades.

Economics

108 Buckman, 2:00 pm – 4:00 pm
Session Chair - Marshall Gramm, Department of Economics & Business

2:00-2:15

Chinese Rural to Urban Migration: The Role of Non-Pecuniary Wages in Migration Location Decisions

Jillian Carr

Faculty Sponsor: Teresa Beckham Gramm, Department of Economics & Business

Since the 1978 opening of the Chinese economy, increased rural to urban migration has both fueled economic growth and strained existing urban infrastructure. Although the Chinese government has attempted to slow this migration (through restrictive household registration programs,) it has continued on a massive scale. Many traditional models of migration in developing countries predict wage equalization and zero net migration at equilibrium, but there are no indicators that either of these outcomes will be observed in China. This paper considers the role of non-pecuniary wages in migration decisions in China, identifies migration-inducing policies and suggests potential remedies. A set theoretic model of the decision-making process is approximated using a time series regression to analyze the migration decision process, comparing non-pecuniary wages in provinces over the five-year period from 2002 to 2006 to predict migration. The conclusions from this model are then compared with the findings of a Markov chain analysis of current Chinese policies and population trends and their future implications.

2:15-2:30

The Academic Effects of Going Greek

Allie Henson

Faculty Sponsor: Nick McKinney, Marshall Gramm, Department of Economics & Business

750,000 college students are Greek in 12,000 chapters on 800 campuses in the United States and Canada. The Greek system dates as far back as the early 1800s. Its size and history make the Greek systems' effect on student live an important topic for college administration, faculty, parents, and students in colleges and universities across the country. In some instances, Greek affiliation has been attributed to binge drinking, hazing, date rape and even death. However, most all United States Presidents and 85% of student leaders on 730 college campuses are Greek, and Greeks raise over $7 million and complete over 850,000 volunteer hours per year. Since no two colleges or universities are the same, the effect of Greek affiliation on student life must be examined on a case-by-case basis. Therefore, this paper is a case study of first year students at Rhodes College. This paper seeks to explain the effect of Greek affiliation on two areas of a first year students' lives: academic performance and retention at Rhodes College. This paper will answer the question of whether participation in the Recruitment process and the Greek system hurts or helps academic performance, and whether Greek life and Recruitment process participants are more or less likely to remain at Rhodes College, holding all else constant.

2:30-2:45

The Tiger and Technology Revolution: A look at the Skills, Performance and Earnings of European Tour Professional Golfers in the Twenty First Century

Matt Becker

Faculty Sponsor: Nick McKinney, Marshall Gramm, Department of Economics & Business

This article examines the determinants of the earnings of European Tour golfers from the period of 1999-2009. Most previous research on the determinants of earnings of professional golfers used reduced-form models in which a player's earnings were a function of skills measured as year-long averages. Shmanske 2008 made major improvements upon these previous studies by using tournament level data to remove measurement errors and allow for the use of variance and skewness of skill distributions in addition to the mean. Furthermore, a structural model was used in which skills were determinants of scores and then score distributions determined earnings. Using these techniques highly improved the R2 values. This paper uses the techniques developed in Shmanske 2008 to see if the data from the European Tour yields similar or different results than previous studies using PGA Tour data. Additionally, by using ten years worth of data another goal of the paper is to see how the returns to various golf skills have changed during the twenty-first century following the many technological advances in the golf industry and changes in the practice habits of players after the emergence of Tiger Woods.

2:45-3:00

Ebay Pricing: A Cross-Goods Comparison

Whitney Hayden

Faculty Sponsor: Nick McKinney, Marshall Gramm, Department of Economics & Business

A consumer's willingness to pay for a particular good is reflected in the ending price in an eBay auction. Data was collected from the top ten sellers in four different products and was compiled into a data set to compare pricing outcomes. This study compares the resulting prices from high cost electronic goods (Nintendo Wii and iPod touch) and low cost durables (camelback water bottle and dark knight DVD). Holding market price, bid format and the sellers sell through rate constant 82 percent of the variation in end price is explained. Market price is very significant and a one percent increase in market price results in a subsequent $122.69 increase in end price on average. On an individual product level the greatest variation in price is seen in the higher value goods. Holding the same measures constant the variation in water bottle prices is best explained with 73 percent of the variation in price being explained and the iPod touch provides the poorest indicator of ending price with only 9 percent of the variation being explained.

3:00-3:15

Determinants of Airfares: Why does your ticket cost what it does?

Steven Josephs

Faculty Sponsor: Nick McKinney, Marshall Gramm, Department of Economics & Business

The dynamics of the airline industry have shifted tremendously since deregulation and the influence of non-legacy carriers—low-cost carriers—have played a significant role in shaping these dynamics. On average, between 2000 and 2008 airfares decreased .7-percent per year, and airports in which Southwest Airlines operates offer fares that are 5-percent lower than those without Southwest. In addition to lowering airfares Southwest increases passenger traffic by more than 4-percent, which confirms the phenomenon known as the Southwest Effect. The results also confirm previous assertions of seasonal demand with the second and third quarter of each year exhibiting higher fares than the first and fourth quarter. Furthermore, a 1-percent increase in the price of jet fuel increases airfares by .15-percent while the price-elasticity reveals that a 1-percent increase in airfares lowers demand by nearly .3-percent, on average.

3:15-3:30

Academic Excellence and Endowment Fund Revenue During Periods of Economic Instability

Ann Notestine

Faculty Sponsor: Nick McKinney, Marshall Gramm, Department of Economics & Business

The purpose of this study is to investigate the relationship between student body academic excellence and endowment fund revenue during periods of economic instability. Based on a sample of 515 observations, academic achievement was measured in terms of criterion gathered by US News and World Report in their ranking of the 50 Best National Universities, spanning from 1997 to 2008. The results of this longitudinal study indicated that seven of the nine measures of academic excellence were statistically significant when regressed on endowment fund revenue. Furthermore, when stock market and interest rate values were added to the regression, both variables were highly statically significant along with measures of student ability. These results support the relationship under investigation, and raise concern over the future of these 50 Best National Universities considering the current financial situation many of these institutions find themselves due to the Credit Crisis.

3:30-3:45

Birth-Ordered Behavior

Suzanne Wineke

Faculty Sponsor: Nick McKinney, Marshall Gramm, Department of Economics & Business

Using data from the National Household Education Survey of 2005, this paper examines the effects of birth order on behavior issues and passing grades in school. When controlling for factors such as parents' education, family size, private schooling, household income level, marital status of parents and the diagnosis of disabilities, higher birth order is found to have a negative effect on children's achieving passing grades, and behavior issues are more likely to occur in later-born children. Only children are found to be less likely to achieve passing grades and more likely to exhibit behavior issues than children with at least one sibling.

3:45-4:00

The Role of Property Rights in the Urban-Rural Wage Gap in China

Dustin Sump

Faculty Sponsor: Theresa Beckham Gramm, Department of Economics & Business

Over the last thirty years mainland China has experienced world transforming growth and lifted hundreds of millions out of poverty. Originally most of the growth occurred in rural areas as farmers were given control over the management of their plots. Overall inequality throughout China decreased as rural incomes rose due to higher agricultural outputs. However by the mid-nineteen eighties the government shifted its reform focus towards the urban areas, particularly the coastal port cities. Rural reform slowed considerably and the central government issued stopgap measures to keep rural land usage contracts from expiring without introducing any significant market reforms. China's refusal to secure rural property rights has a role in reducing agricultural production growth due to less financing and investment, preventing consolidation in land holdings thus economies of scale, and hindering the development of a free labor market which partly contributes to increasing urban-rural inequality. Using international and domestic intend to measure land security based on the number of reallocations of farmers' land in a province over time and the amount of compensation farmers received for any appropriated land. I then intend to study how the degree of land security effects agricultural productivity and the urban rural wage gap.

POSTER SESSION I

McCallum Ballroom, 11:00 am – 1:00 pm

Community Connections

#1 Homelessness in Memphis

Morgan Logerot, Carrie Tennant and Preston Poole
Faculty Sponsor: Arielle Goldberg, Department of Political Science

This project examined and evaluated the organizations, both public and private, that provide services to the homeless population in Memphis. Specifically, we delineated the kinds of services that these organizations provide, and assessed whether or not they are adequate in filling the needs of the homeless. We also considered the structure of Memphis government and relevant laws/policies, and how they affect the homeless community. Our research included interviews with members of the homeless community, the Memphis Police Department, and the director of the Union Mission Shelter, as well as a statement from Mayor Herenton's office. Finally, we used the information to propose a more efficient way for the city of Memphis to adjust to and provide for the growing homeless population.

#2 Understanding Adult Education in Memphis: Memphis City Schools and Its Impact

Erin Foster, Eric Dailey
Faculty Sponsor: Arielle Goldberg, Department of Political Science

Sixty-seven percent of Memphis City School students graduate each year, leaving the city with a high population of an uneducated class. Moreover, college readiness and matriculation are at an all-time low in Memphis. This project aims to examine some of the larger, institutional reasons that Memphis City Schools are not graduating nearly as many students as comparable districts. The lack of high school and college graduates and absence of a skilled workforce leaves the city struggling to make any good case for recruiting big businesses and corporations. After dropping-out many students realize the need for an education when trying to apply for basic work. The school system and numerous nonprofits offering adult education such as GED obtainment courses are available within the city of Memphis. How accessible are these programs to possible participants? Memphis Senior High School graduation rates and college readiness and matriculation rates were examined to better understand the pressing need for adult education programs in Memphis. Several factors such as child care, transportation, cost, average length of time taken to complete the preparation for the test, and prerequisites were measured to evaluate the success of the GED preparation centers throughout the city.

#3 Governmental Housing in Memphis

Philinese Kirkwood, Tiara Brice
Faculty Sponsor: Arielle Goldberg, Department of Political Science

We examined government housing in Memphis because of some of the readings on the politics of public housing and the dynamics created by public housing legislation. With data from the census, we explored the percentage and demographic of people who qualify for public housing. We examined the condition and demographics of public housing. Are the public housing in safe conditions and healthy for families to live in? What is the demographic of people living in these low-income housing? Also, we studied whether or not living in public housing affects the decision of a person dropping out of school. Data was used from the census, public housing administration, interviews, and visiting a public housing.

#4 Mayor Herenton, Memphis City Contracts and Urban Consolidation

John McGeoch, Elizabeth Ashton and Darren Findlay
Faculty Sponsor: Arielle Goldberg, Department of Political Science

Over the course of his five terms, Mayor Herenton has stirred considerable controversy. As mayor, Herenton has attracted criticism for specific appointments, contracting decisions, and campaign practices. This project investigates several contracts awarded by Herenton to municipal unions and private firms and considers the political ramifications of each contract. More generally, the project examines how controversies have harmed the mayor's reputation and his ability to implement new policy ideas and reform initiatives. One initiative Herenton proposes is the consolidation of the Shelby County government and Memphis city government. The project analyzes the costs and benefits of such a system through Nashville's merger with Davidson County to form, "Metro Nashville." Additionally, the project explores the history behind the attempted consolidation of Memphis and Shelby County governments and resistance to the proposal. Research suggests that resistance is related to Shelby Country residents' fear of crime, poor schools, and the Mayor himself. Public records examination, local media interviews, and pertinent academic articles are utilized.

#5 Crime In the Memphis Area

Maura Weber, Chris Skoda and Chenise Anthony
Faculty Sponsor: Arielle Goldberg, Department of Political Science

Crime has been a pertinent issue in the Memphis area. Prevention as well as enforcement has continued to be the main concern for citizens. More recently, Memphis has become one of the most dangerous cities in the country, limiting its national appeal. Our project identified various sources of crime in the area in order to execute preventive measures. We researched the relationship that crime has with gun control laws and the rise in foreclosed housing, as well as the changing structure of law enforcement. We researched these areas through statistical data, current laws, city council reports, and qualitative data such as personal interviews. Through our research we articulated the defining factors of each relationship and the overall effect on the city.

#6 The History of MIFA from 1998 to 2009

Lindsey Calder, Christian Butler and Sheena McKinneye
Faculty Sponsor: Gail Murray, Department of History

Our main objective is to identify the role of women in the history of the Metropolitan Inter-Faith Association (MIFA) from 1998 to 2008. MIFA was founded in 1968 to find a solution for poverty and racial division in Memphis, Tennessee. Through interviews, research, and tours, we have come to realize that many women are directly affected through the services of MIFA, specifically for families in crisis, teens, and seniors in the community of Memphis (and the surrounding areas). Within these categories, we analyzed how women play a role in providing and accepting the services of various MIFA programs. Such programs include Housing Opportunities, Emergency Services, COOL, Senior Transit, Meals on Wheels, Handyman, Senior Companion, and Long-Term Care Ombudsman.

#7 Community Gardens Do More Than Just Grow Vegetables

Elizabeth Saba
Faculty Sponsor: Michael Kirby, Department of Political Science

As we enter a period faced by peak oil, global climate change, and economic distress, Americans are realizing that they must develop their cities in more sustainable, environmentally sounds ways. In the past 20 years, a broad-based community garden movement has developed in the United States to respond to these challenges. Community gardens do more than just grow vegetables, they grow safe neighborhoods. This study tested the hypothesis that green space, specifically community gardens, reduces crime in Memphis. To this end, I utilized GIS technology to determine if neighborhood crime rates vary due to proximity to community gardens. Since this study is primarily interested in the neighborhood level effect that community gardens have on crime rates, the study areas for each community garden were a relatively small radius around each garden.

#8 The Broad Avenue Business District

Larry Hurd
Faculty Sponsor: Michael Kirby, Department of Political Science

I researched the entrepreneurial side of Broad Avenue dealing with specific business owners. I concentrated on why they chose the Broad Avenue area for development of their businesses based on information gained from research that explained elements that make the inner city a good or bad place for business development. I developed a survey that asked business owners basic questions about why they came to the area and their feelings towards the proposed new plan of development, and its possible impact on their businesses. The majority of the business owners came to the Broad Avenue area mainly because it was fitting; it was a developing area, and they assumed that the customer base would be good. Most of the business owners were optimistic about future plans for the area based on a sense that changes would spark neighborhood excitement and increase the amount of customers in the area.

#9 The Perception of Crime in Memphis

Caralee Barrett
Faculty Sponsor: Michael Kirby, Department of Political Science

The research issue is a comparison of perception of crime in the respondents' neighborhoods and in Memphis as a whole. To accomplish this, I conducted a door-to-door survey of the residents of the neighborhood adjacent to Rhodes College. Obtaining residents' perceptions allowed me to compare what they think about crime both in their neighborhood and in Memphis to what the actual crime rates. After learning about the system Memphis uses to report crime and the artificially higher crime statistics it inherently produces, my perception of crime was altered, and therefore, I wanted to see if this was the case for others. While researching, I found that the number of years spent in the neighborhood and in Memphis in general, as well as age and sex, corresponded with the perception of crime.

#10 Complexities in Developing Programs in a Latino Nonprofit

Whitney Warren
Faculty Sponsor: Michael Kirby, Department of Political Science

The project follows the challenges faced in creating a program at Latino Memphis. It highlights an after-school program for high schoolers that has turned into a tutoring program serving people ages 5-55. I examined specific issues such as: the complexities in advertising versus word of mouth, who really creates the program, reconciling the employees and volunteers vision with what the community needs, if people can be turned away, and accommodating an increasingly large and diverse group.

#11 The Impact of Nonprofit Housing Rehabilitation on the Surrounding Neighborhood

Lacy Ward
Faculty Sponsor: Michael Kirby, Department of Political Science

I examined apartment buildings located on Maury Street that are owned by the Vollintine-Evergreen Community Association, a local community development corporation. Over the past several months efforts have been made by volunteers to restore these apartments in order to get them occupied. Once occupied, they can serve as a good example to the rest of the community. The goal is to try and increase the safety of the living environments for these people living on and around Maury Street. I surveyed the neighborhood to see if these improvements had a spin-off effect on private landlords.

#12 Graffiti in Hollywood Springdale

Dale Baker
Faculty Sponsor: Michael Kirby, Department of Political Science

The focus of the study was an examination of the graffiti in the Hollywood-Springdale neighborhood. The survey identified sites with graffiti and categorized the sites by severity and ownership, public or private, occupied and otherwise. The sites were mapped to gain a perspective of the geographic distribution.

Finally, the sites were resurveyed to determine whether or not the City of Memphis took the necessary steps to remove the graffiti from the sites submitted to it for cleaning.

#13 Volunteerism Within Neighborhoods

Brittany Moore
Faculty Sponsor: Michael Kirby, Department of Political Science

I studied how volunteerism creates social capital within a neighborhood. This study shows how volunteering can influence social capital within a neighborhood. I created two surveys in order to evaluate the perceptions of volunteerism among volunteers themselves and leaders of volunteer programs. I found that both volunteers and neighborhood organizations rely heavily on volunteerism. Volunteers rely on volunteerism as a way to connect them with their neighborhoods and neighborhoods previously unknown to them. Volunteers also use volunteerism as a way to feel good about themselves by helping their community. Neighborhood organizations, on the other hand, rely on volunteerism in order to stay in business. In many instances, neighborhood organizations are in high demand by volunteers so that hired labor is not required. Volunteerism also creates a gateway between the neighborhood organization and the neighborhood itself by creating a harmonious and trusting relationship between the neighborhood residents and the volunteers.

#14 Patterns of Problem Properties

Eloise Schlafly, Virginia Fall
Faculty Sponsor: Michael Kirby, Department of Political Science

The purpose of the research project was to survey properties in the northwest quadrant of the VECA community to address the concerns of local residents in regards to abandoned houses, unkempt yards, and dilapidated structures. We identified eyesores and problematic properties within the area. Specifically, the research identified geographic patterns in problem properties to determine if they cluster in several areas or are distributed through the area. The research also identified the extensive of the problems. We provided this information to the neighborhood organization and our project reflects their reactions to the research.

#15 The American Dream Gone Awry: Expressed Needs of Residents in Midtown North

Ian Todd, Kristin Forbes, Ashley Mitchem, and Wei Yu
Faculty Sponsor: Michael Kirby, Dorothy Cox, Department of Political Science

Over the summer of 2008, Rhodes students participated in the "Feet On The Street" team for the Midtown North Community Association, getting out in the neighborhood and talking with residents about their aspirations and needs for the community. They held conversations with the community about how they envisioned their community and steps that the residents felt were necessary in attaining those dreams. Most of the residents were very practical in their assessment of needs for the community. Vacant housing and lots posed the greatest problem by creating eyesores and providing shelter for illegal activity, which lowered the morale of the community the most. Subsequently, a need for better security and more police patrols was expressed by many residents. Drugs and trash littering the neighborhood concerned many residents hoping for a better place to raise their children. Yet, despite all of their troubles, the homeowners still had the one necessary element for change – hope. They still aspire to make Midtown North the best place to live, work and play. The poster shows the work performed by the Feet On The Street team, including the data collected from the conversations with residents and the steps taken to implement change within the community.

#16 Philosophy of Education Practicum: Breakthrough Collaborative

Lacey Hudspeth, Eric Stradley and Cal Lee
Faculty Sponsor: Patrick Shade, Department of Philosophy

For the past two semesters the authors have been participating in a Philosophy of Education practicum, whereby we worked to implement practical educational changes for the Memphis community. Our project specifically has been to work on establishing a permanent chapter of the nationally accredited program, The

Breakthrough Collaborative. This program brings college students in to teach middle school students, thus serving a dual purpose: it promotes education as a field of study and as a professional degree and it also bridges the age gap between student and teacher, thus more easily engaging the students. Our presentation focuses on an extensive discussion of the program, why the Memphis community is a good fit for this program, and the bureaucracy, and other external quandaries that our team has faced this year. We evaluated the different sets of hindrances to our project.

Environmental Issues

#19 Determining efficient energy usage in Barret Library through cost-benefit research

Jacqueline Gentry, Sarah Rogers
Faculty Sponsor: Jennifer Houghton, Department of Biology

The lights used in the Barret Library contribute to a significant amount of energy used on campus, increasing the Rhodes carbon footprint. Our study aims to determine the light usage in the Barret Library and reduce energy usage while minimizing costs. We will assess what types of lights are used, what areas of the library must have emergency lighting during closed hours, whether it is more efficient to leave fluorescent lights on during a short time span or turn them off and then on again, where it is it feasible to put motion sensors, and whether it is feasible to use light intensity switches in areas with windows. To analyze the projected effectiveness of reducing the light usage in Barret Library, we will collect data concerning costs and benefits about the implementation of green initiatives, including how modifications will save on future costs. We will present our findings to Physical Plant.

#20 Linking Geochemical Models and Microbial Populations Within Hydrothermal Chimneys on the East Pacific Rise

Charles Forbes
Faculty Sponsor: Jennifer Houghton, Department of Biology

A hydrothermal chimney, or vent, is a fissure in the earth's surface located deep in the ocean with consequential geothermal and geophysical properties. We present here a statistical comparison of the reported phylogenetic diversity from two studies: a "proto-chimney" at Q vent, sampled after 92 hours (McCliment et al., 2006), and a mature beehive chimney at Bio9 vent (Kormas et al., 2006), both on the East Pacific Rise. An adapted Shannon-Weiner index was used to measure species richness and species evenness. The mature chimney displayed a significantly lower diversity than expected using the delta test, a measure of functional diversity, relative to a master database of phylogenetic data reported from vents along the East Pacific Rise. This result may indicate that the beehive environment present at the time of sampling at Bio9 vent (2000) harbored a more unique or endemic population, despite the chimney being well-established. In comparison, the proto-chimney harbored a similar abundance of Archaeal clones but had a functional diversity score closer to the expected average.

#21 Urban Memphis Parks as carbon sinks

Jacqueline Gentry
Faculty Sponsor: Rosanna Cappellato, Department of Biology

Based on Earth Day Network data from 2002, the city of Memphis, TN, releases an estimated 64 million tons of anthropogenic CO2. This study aimed to assess how much of the total CO2 is sequestered and stored by the Memphis parks. To measure the canopy coverage of each park, the amount of carbon stored and sequestered, the amount pollution removed, we used the software program CITYgreen produced by American Forests. Results showed that the 35 parks (1.5%, or 690 ha, of the total urban area) store 82,920 tons carbon and sequester 645 tons carbon. Parks remove 93.8 tons (metric) of pollution including carbon monoxide, ozone, nitrogen dioxide, particulate matter, and sulfur dioxide, a service valued at $51,7341. These values are significant considering that only 35 out of 166 of the Memphis parks were included in this study.

#22 Assessing soil carbon sequestration in turf grass and urban forest ecosystems

Andrew Roads, Adam Bohnert
Faculty Sponsor: Rosanna Cappellato, Department of Biology

Carbon sequestration is a naturally occurring process in which atmospheric carbon dioxide is stored as another form of carbon such as below ground biomass. As concerns have risen regarding the greenhouse effects of atmospheric carbon dioxide, carbon sequestration has received increased attention as a possible mechanism to reduce atmospheric carbon dioxide levels. The soil carbon pool is one of the largest terrestrial carbon reservoirs and has become a focal point for sequestration research. Sequestration involves not only carbon uptake and storage, but also carbon efflux from a system. This study examines the efficacy of soil carbon sequestration in two urban landscapes by measuring the soil respiration rates in the old-growth forest of Overton Park and the turf grass system of the golf course at the Memphis Country Club. Soil respiration was measured in forested and non-forested areas of Overton Park and turf-covered and bare plots at the golf course. Microbial respiration was also measured at each of these plots. The forested areas had the least amount of soil respiration and had microbial respiration rates consistent with those of the turf grass plots. Therefore, the forested areas may have the greatest capacity to sequester carbon of these systems.

#23 The effect of bark stripping on Liquidambar styraciflua and Quercus alba in Overton Park

Kelsie Persaud, Allison Graham
Faculty Sponsor: Rosanna Cappellato, Department of Biology

The eastern grey squirrel (Sciurus carolinensis) can be destructive in woodlands. They strip bark from the trunk and branches of trees, especially from species such as sweet gum (Liquidambar styraciflua) and white oak (Quercus alba). Bark stripping damage can cause heavy staining due to fungal infection of damaged bark, and structural defects are also frequent. In addition, damage to the bark and the tissues within (cambium and phloem) often leads to a reduction in growth. Weakened stems may break in the wind and any trees that are ring-barked will die from that point up. This will eventually result in associated changes in the biodiversity. Strategic observation can be used to assess the effects of bark stripping in Overton Park on the sweet gum and white oak tree species. Both species had significant amounts of tree damage due to bark stripping, but white oak had greater damage. This could be explained by the fact that there is a greater density of oak trees in Overton Park; therefore, there is a greater availability of resources for the squirrel population.

#24 The Effects of the Invasive Purple Loosestrife (Lythrum salicaria) in Craighead Forest Park, Arkansas

Joiceann Compton, Erica M. Murrell, Faculty Sponsor: Rosanna Cappellato, Department of Biology

The purple loosestrife is an invasive plant species that is present in forty- seven US states. This plant destroys natural habitats for both land and aquatic animals. It also decreases the quality of water in areas in which it thrives. The plant's dominance over other species is caused by its lack of natural predators, regenerative ability, and vast dispersal rate. It consumes a large amount of nitrogen, phosphate, and oxygen, which is detrimental to the community it is in. All biological, chemical, and physical attempts in controlling the spread of this plant have failed. The objective of this experiment is to test the changes in biodiversity caused by the purple loosestrife plant by evaluating plant growth and nutrients found within the water of Craighead Forest Park. Biodiversity levels will be observed by comparing the number of plant species in eight sites with purple loosestrife and eight sites without the plant. Additionally, water quality will be tested for lower levels of nitrogen, phosphate, and dissolved oxygen. The expected results include a decrease in biodiversity in areas where purple loosestrife is present compared to the areas where the plant is absent. A decrease in nitrogen, phosphate, and oxygen is also expected in all areas where the plant is present.

#25 The Presence of Privet Species & Disturbance In The Overton Forest

Curyona Pritchard, Jennifer Whatley
Faculty Sponsor: Rosanna Cappellato, Department of Biology

The abundance of privet, a species indicating disturbance, in Overton Park is measured to determine if the Overton Park Forest is in fact an old-growth forest. We hypothesize that there will be fewer numbers of privet in the core of the forest as opposed to the edge. Privet is an invasive species usually found in disturbed habitats and secondary forests and has been found in areas of Overton Park. If the abundance of the privet is similar inside the forest to the edge of the forest then it is completely disturbed and not an old-growth forest. In 20 meter intervals we are tallying the abundance of privet in a 3 meter radius and using GPS to locate the sites. Upon mapping this information we will be able to clearly determine whether or not our hypothesis is supported or refuted.

#26 A Comparative Study of the Upper and Lower Wolf River Pertaining to Water Quality

Charles Forbes, Michael Boehmler, Faculty Sponsor: Rosanna Cappellato, Department of Biology

The Wolf River is a water system that runs through Memphis and drains into the Mississippi River. Over the past few decades, the Wolf River system has been drastically altered by urbanization, waste management- that is a positive change over time, and increased population densities. By comparing the upper and lower sections of the Wolf River, we will analyze the effects of human influence on plant diversity- in respects to alpha and beta diversity. Water quality will be assessed by measuring turbidity, flow rates, dissolved oxygen content, nitrogen and phosphorous levels, and temperature. We expect to find a higher alpha diversity related to water quality, and a large beta diversity between the upper and lower Wolf River.

#27 Presence and Distribution of Invasive Asian Carp Species in the Wolf River, TN

Gustavo Huerta, Brett Miller
Faculty Sponsor: Rosanna Cappellato, Department of Biology

Silver Carp (Hypopthalmichthys molitrix) and Bighead Carp (Hypopthalmichthys nobilis) are two native species of eastern Asia which were introduced to North America in the 1970's. Through human transportation and natural flooding, carp populations have since become abundant throughout North America. In particular, carp populations within the Lower Mississippi River Basin have increased exponentially due to high growth and reproductive rates. The impact of silver carp on native river species is severe. Juvenile carp compete with natives for food, while adult carp feed on vegetation, which is used by natives as habitat. The primary goal of our research is to determine the presence and distribution of carp in the Wolf River, a tributary of the Mississippi River. Due to the close proximity and accessibility of the two rivers, we are concerned that carp may have migrated into the Wolf River ecosystem from the Mississippi River. Carp abundance will be observed and quantified at one mile increments along the Wolf River from the Ghost River section to Mud Island. Much effort has been placed in preserving the habitat of the Wolf River, however these conservation efforts could be compromised if an invasive species were to migrate into the ecosystem.

#28 Water Quality in Urban, Suburban, and Rural Areas of the Wolf River

Alice Hilgart, Kayla McCrury
Faculty Sponsor: Rosanna Cappellato, Department of Biology

Human impact has affected the world in a wide variety of ways and our impact reaches even the farthest corners of the earth. Water is a constant in every ecosystem, and therefore the health of these ecosystems is dependent on the quality of the water. For our project water samples were collected from the Wolf River flowing through urban, suburban, and rural areas. We analyzed the samples for nitrates and phosphates, carbon dioxide, oxygen, bacteria, pH, and total dissolved solids. We predicted that phosphates and nitrates would be found in greater quantities in rural areas. But we also predicted better overall water quality in

terms of total dissolved solids, presence of E. Coli, and levels of dissolved CO2 and O2 in rural areas than in urban and suburban areas.

#29 Influence of Edge Effects on Tree Size in Overton Park

Khang Dang, Rob Koehler
Faculty Sponsor: Rosanna Cappellato, Department of Biology

Edge effects are often the result of human fragmentation of habitats. For example, roads, deforestation, and urbanization all create forest edges that are structurally different from the habitat interior. The combination of certain edge factors (changes in microclimate, increased predation, and sunlight) tends to increase both growth rates and mortality rates in certain tree species. The average tree age and size is predicted to be smaller because of the increased mortality rate of trees near edges. Also, higher growth rate at the edge will produce a population of younger and smaller trees. In order to validate our hypothesis, we measured different tree size and structure throughout the park, and we focused our attention mostly on the first 10-15 meters from the edge and the forest center interior. We found that there existed a higher number of trees per unit area of younger, smaller diameter trees near the edges of the forest as compared to the interior. Trees from the interior of the forest were larger in diameter and taller in height. We concluded that edges are affecting the structure of the forest in Overton, making the forest interior more vulnerable to external influence.

#30 Impact of Forest Fragmentation on Seedling Abundance in Overton Park

Blaire O'Neal, Kimberly Green
Faculty Sponsor: Rossana Cappellato, Department of Biology

A large amount of the old growth forest belonging to the Memphis Zoo is being cut down in order to pave the way for a new exhibit, destroying the natural growth barrier that previously existed between the Zoo and Overton Park. The construction has created a new edge, which may lead to a loss in biodiversity. In this study, the seedling density was measured in 9 plots at varying distance from the new edge. The soil moisture, temperature, and pH readings were taken at each site. Results showed that while there is no significant difference in these environmental measurements among the sites, seedling density was greatly affected by the new edge. Seedling density increased as the distance from the new edge increased. While seedling density was low at the edge, Smilax spp., common greenbriers in the forest, were present in higher amounts. Thus, the decreased seedling density could be a direct effect of the Smilax, which thrived as a result of the edge microclimate. Based on these results, we conclude that the construction of the Memphis Zoo is having a negative effect on the future health of the old growth forest of Overton Park.

Social Sciences

#31 Racial Privilege

Jesse Cavett, Alex Margolin
Faculty Sponsor: Christopher Wetzel, Department of Psychology

We have been conducting a literature review on racial privilege and how it permeates all facets of our society from the lowest social strata up to the very leaders of our country. We are investigating not only how racism operates on an individual basis, but we were also interested in how systematic racism occurs and has come to be. We are concerned with how institutionalized racism can go unnoticed yet nonetheless exert its influence on any fabric of society, including Rhodes College. We also examined the opposing side of the racial privilege dynamic. Specifically, we investigated how white privilege occurs in conjunction with individual and systematic racism. We examined possible concepts, activities, or anything that could potentially diffuse racial tensions and issues in our society.

#32 Class Privilege and the Opportunity for Upward Mobility In Education.

Lindsey Gibson, Camille Byars
Faculty Sponsor: Christopher Wetzel, Department of Psychology

Many studies have shown correlations between socioeconomic privilege and access to health care, quality education, social networks, job opportunities, crime, and social deviance. We concentrated on the relationship between socioeconomic status and education, differences between generational poverty and generational affluence, as they compare to the American middle-class. Specifically the research concentrated on the quality of educational opportunities and the potential for upward mobility.

#33 The Secret Power of Beauty

Amanda McElroy, Maggie Hill
Faculty Sponsor: Christopher Wetzel, Department of Psychology

It is widely accepted among psychologists that unconscious, systematic privileges for certain groups widely exist. Much research over the past three decades has specifically examined how attractiveness bias helps those people considered to be physically attractive gain advantages in life over their unattractive counterparts. The present work serves to review previous literature in three primary domains: origins of the bias, evidence of the bias, and possible solutions to reduce the bias. Findings demonstrate that while attractiveness bias has surely been enhanced by aspects of culture, it is likely that humans have an innate preference for attractive faces. These preferences have been evidenced in a variety of ways. First, the physical attractiveness stereotype (PAS) has shown that research participants attributed more likable personalities to attractive than to unattractive people. More importantly, attractive people experience more positive life outcomes concerning employment, education, romantic life, and friendships than unattractive people do. This bias affects people across cultures, ethnicities, genders, and age groups, and research is still needed to identify possible effective solutions.

#34 Career Perspectives of Nursing Students: Traditionals Versus Instrumentals

Dat Nguyen
Faculty Sponsor: Dee Birnbaum, Department of Economics and Business Administration

The research sampled 37 students who were in their first semester of nursing school in a baccalaureate program at a large state university. Each student in this study completed an interview (qualitative data) and two surveys (quantitative data). Through a content analysis of the interviews, regarding the choice of nursing as a career, two types of nurses emerged: traditionals and instrumentals. A traditional nurse is one who wants to pursue a career in nursing so he or she could help others; whereas, an instrumental nurse is one who wants the material rewards and flexible career that nursing will provide. The researchers hypothesized that traditional nurses would be more morally committed to nursing as a career and would identify with it more strongly than instrumentals, as measured by Blau's (2003) commitment measure. The results from the t-tests indicated that traditional nurses, indeed, are more morally committed to nursing and identify more strongly with the career; however, the p-value showed that only the identification aspect of commitment is statistically significant. This could be due to the small sample size. The results are even more interesting because the interviews and the surveys were done using different methods and at different times so that the results could not be explained by common method variance.

#35 The Effects of Race, Language, and Insurance on Early Intervention Services

Zachary Ramsey, Jeff Carney, Tishanna Hollins, and Emily Weiner
Faculty Sponsor: Janet Panter, Department of Psychology

Literature has shown that African Americans as a group have a more positive view toward help-seeking behaviors compared to other racial groups. However, this belief does not necessarily correlate with more positive outcomes from these services. This discrepancy may be due to socioeconomic factors, language, and differing types of medical insurance rather than being attributed to race. Children ages birth to three with disabilities or developmental delays are eligible to receive early intervention services under Part C of the Individuals with Disabilities Education Act. These services were evaluated through the National Early Intervention Longitudinal Study (NEILS). Using the NEILS dataset, our research project examined the effects of race (African American, Caucasian, and Hispanic), language (English and Spanish), and medical

insurance on Early Intervention services, particularly the quality of the services rendered and the outcomes achieved. Our hypothesis is that families without insurance and/or who speak English as a second language will have less positive outcomes. Further, we expect discrepancies between levels of insurance, the outcomes and perception of EI services; the greater the insurance coverage the more extensive the services are, which leads to better outcome. The factors explored could have lasting implications for reforms in existing Early Intervention services.

#36 Frequency of Disability According to Socioeconomic Status and Maternal Education Level

Sarah Israel, Amanda Goyer, Sammy Knefati, and Claire White
Faculty Sponsor: Janet Panter, Department of Psychology

Socioeconomic status has been shown to have an effect on a child's overall health, including the presence of disabilities or developmental delays. The National Early Intervention Longitudinal Study (NEILS) studied children and families receiving early intervention services, surveying over 5,000 families and gathering data from local service providers and teachers. Our project used the NEILS data to examine the relationship between socioeconomic status and category of disability, particularly focusing on cognitive and speech and language delays/disabilities. We also investigated the relationship between maternal education level and disability category. Our hypothesis is that children in the lowest socioeconomic brackets would have a proportionally higher frequency of cognitive delays/disabilities.

#37 The Impact of Socioeconomic Status on Early Intervention Outcomes

Sarah Finney, Emily Munro and Stephen Rintoul
Faculty Sponsor: Janet Panter, Department of Psychology

In American society today, children from low socioeconomic status (SES) families are less likely to receive early intervention (EI) services than their higher SES peers. This trend is disturbing for a variety of reasons; one concern is that children from lower SES groups are more frequently diagnosed with developmental delays, particularly in the areas of speech and language, than children in higher SES brackets. However, children from higher SES families tend to benefit more from EI services than their lower SES peers. The National Early Intervention Longitudinal Study (NEILS) surveyed over 5,000 families receiving EI services from a range of SES brackets. Using the NEILS data, we examined the relationship between SES and EI outcomes in both the academic and the social realm of child development. Our primary investigation questioned whether EI services were more beneficial for children from the lower-middle income bracket than for those in the lower income bracket. Our discussion evaluates some possible reasons for disparity in EI outcomes between SES groups.

#38 Peer Relations in Children with Diagnosed Disabilities

Aubrey Clendenin, Caitlin Hutto and Todd Cummings
Faculty Sponsor: Janet Panter, Department of Psychology

Children's peer relations in kindergarten have an enduring effect on the development of their social and emotional skills. The goal of this study is to explore peer relations in children with diagnosed disabilities. By using data from the National Early Intervention Longitudinal Study (NEILS), this study investigates differences in peer relations among children within specific disability categories. This study also presents intervention techniques teachers can utilize within their classroom to improve peer relations between children diagnosed with a disability and their typically developing peers.

Memphis Music and Religion Archive

#39 Memphis Music and Religion Archive: The Influence of Elvis Presley

Lindsey Gibson, Eric Hagemeyer, Pamela Palmer, Rebecca Rieger
Faculty Sponsor: Tom Bremer, Department of Religious Studies

The Elvis Presley component for the Memphis Music and Religion Archive has multiple facets. The first aspect of our research focuses on gathering a detailed literature review of all publications on or about the life and times of Elvis Presley. This collection of essential Elvis publications would assist any fan or scholar in their quest to learn more about Elvis Presley and his relationship to Memphis. The second part of our research focuses on gathering qualitative information from Elvis Presley fans. With Rhodes College Institutional Review Board Approval, we will be contacting all registered Elvis Presley fan clubs in the world, and will solicit their members for participation in answering a questionnaire type (online survey) document. These documents will provide detailed information on Elvis' influence on persons around the world; from their earliest memories of Elvis, to their favorite song, and even how his death has impacted their life. These responses, when gathered in the archive, will provide insight and knowledge for Rhodes students, research scholars and members of the community.

#40 Memphis Music and Religion Archive: Technical Challenges

Eric Hagemeyer, Lindsey Gibson, Pamela Palmer, Rebecca Rieger
Faculty Sponsor: Tom Bremer, Department of Religious Studies

For the past six months I have been involved in the launching of the Memphis Music and Religion Archive, and my specific role has been that of a technician. While my colleagues have been gathering the primary and secondary sources for the archive, I have been responsible for designing the system into which we will put those sources. A few of my tasks include choosing the bibliographic software we use to document the sources, writing protocols for proper documentation, and compiling the source library itself. The reason I have chosen to call my presentation "Technical Challenges" is that these tasks I have outlined have not been especially straightforward. In working with the MMRA I have learned that using an existing archive may be simple, but making one yourself is considerably more difficult. Nevertheless, I feel that we have made a lot of progress in getting the archive off the ground, and we continue to solve problems constantly. My presentation will go further into depth on the nature of these problems and how we overcame them - for example, how we streamlined the annotation process for documenting our sources, and how we plan to integrate oral histories into the archive.

#41 Memphis Music and Religion Archive: Source Collections

Rebecca Rieger, Lindsey Gibson, Eric Hagemeyer, Pamela Palmer
Faculty Sponsor: Carole Blankenship, Department of Music

Through the Mike Curb Fellowship, I am working with a group of students to put together an archive of Memphis Music and Religion for Rhodes College. My specific role is to find printed music and recordings that would be useful and worthwhile for the archive to acquire. I am continuing my research from Rhodes Institute for Regional Studies 2008 on Lucie E. Campbell, Memphis gospel composer, in order to have a basis for my research. I am creating a wish list of music (recordings, books, articles) that could possibly be added to the archive. The list includes the cost of the music and how it may be purchased. I have also spoken with Memphis musician Earlice Taylor and have begun a list of people who should be interviewed for the archive, using their expertise and preserving their recorded words.

#42 Memphis Music and Religion Archive: New Acquisitions

Pamela Palmer, Lindsey Gibson, Eric Hagemeyer, Rebecca Rieger
Faculty Sponsor: Carole Blankenship, Department of Music

Over the course of the fall and spring semester of this academic year sources for the Memphis Music and Religion Archive have been collected. This archive seeks to collect primary and secondary library source materials pertaining to the relationship between music and religion in the city of Memphis. These available sources have been collected from a wide variety of libraries including the Rhodes College Barrett Library, the Memphis Public Library and the University of Memphis Music Library. These sources take many different forms including: musical scores, scholarly papers and dissertations, books, sound recordings, videos and hymnals just to name a few. The subject matter these sources cover is just as diverse and ranges from Sacred Harp Singing to Stax musical artists. The goal of the archive at this point is to locate and organize as many cataloged sources within the Memphis area as possible. This search will hopefully be

extended to the Mid-South area in the near future and create a thriving resource for students and researchers.

History

#43 The Power and Potential: The WCTU, Black Women's Clubs, and The Failure of Interracialism During the Progressive Era

Taylor Barnes, Catherine Vierling and Jordan Russell
Faculty Sponsor: Gail Murray, Department of History

The Progressive Era, which lasted from roughly 1890 to 1920, was a movement of great social agitation in American History. Undoubtedly, both black and white women played integral roles in shaping the movement and their participation in various clubs and organizations had a profound impact on the social and political spheres. The legacy of this work, however, is mottled by the failure of interracialism-that is the cooperation of black and white women. This project investigated how and why interracialism failed during the late 19th and early 20th centuries. To do so, it sought to understand Progressivism itself and paint the scene of the women's club movement. It then moves to understand why black women's agendas were so varied from white women's, requiring an investigation of the history that led to the Progressive Era and black women's clubs. Finally, using the Women's Christian Temperance Movement as a manifestation of the failure of interracialism, the project used this club as an example of the profound effects of the time period and varying agendas on the failure of interracialism.

#44 Women in Rap Music

Anne Frymark, Ciara Conway and Tiara Brice
Faculty Sponsor: Gail Murray, Department of History

Rap music has received much media attention recently due to the portrayal of women in the genre and has become one of the most popular genres of music in American culture. Many feminists believe that an overly negative image of women, particularly black women, is perpetuated through this influential media form. Arguably, this portrayal of black women has been present since the time of slavery. That, however, has not detracted from popularity of rap music. This presentation aims to assess the images of women pervasive in American rap music, including the historical roots of rap. Using live music, excerpts from documentaries, and research articles, we are used to discuss whether or not women are passive participants in the image formation of women in rap music.

#45 Female Slave Agency in the American South: Victimization, Resistance, and Negotiation

Daniel Williford, Sybil Fortner, Stephanie Johnson, and Jessica Rathel
Faculty Sponsor: Gail Murray, Department of History

Considered broadly, the experiences of enslaved women in the American the South do not yield a single, clear narrative of life under slavery. Rather, careful examination of the commonalities between the lives of African American women reveals a complex mixture of victimization, resistance, and negotiation at play in their actions. Through practices such as domestic subterfuge, birth control, truancy, and the formation of sexual partnerships, enslaved women attempted to reassert a modicum of control over their circumstances. In doing so, however, they reacted not only to their constraining legal status, but also to direct acts of violence and repression by their owners. By analyzing these four methods as forms of resistance, responses to victimization, and processes of negotiation, we arrived at a clearer understanding of how slave agency functioned.

#46 The Role of Gender and Race in Advertisement

Fletcher Ferguson, Grier Haney, Carol Wicker
Faculty Sponsor: Gail Murray, Department of History

Advertisements are thrown our way daily. The internet, bill-boards, posters, radio, and television are persistently trying to sell consumers their various products. Our project focuses on how race and gender are used by advertising agencies to sell a product in television commercials. Advertisements used in present day society tend to perpetuate and imply certain gender and racial stereotypes. By analyzing Beer Company, McDonalds, and Plan B (an emergency contraceptive) commercials we were able to highlight how agencies use race and gender to sell products, and what underlying meanings these tactics hold.

Geographical Information Systems

#48 Areas of Texas at High Risk for Water Contamination

Andrew Foss-Grant
Faculty Sponsor: David Kesler, Department of Biology

#49 Use of GIS to Evaluate Threats to Waterfowl Breeding Habitat

Brett Miller
Faculty Sponsor: David Kesler, Department of Biology

#50 Lick Creek Flooding and VECA

Reagan Doyle
Faculty Sponsor: Mike Kirby, Department of Political Science

#7 Community Gardens Do More Than Just Grow Vegetables

Elizabeth Saba
Faculty Sponsor: Michael Kirby, Department of Political Science

#2 Understanding Adult Education in Memphis: Memphis City Schools and Its Impact

Erin Foster, Eric Dailey
Faculty Sponsor: Arielle Goldberg, Department of Political Science

Rhodes – St. Jude Summer Plus Program

#51 Diffusion Tensor Imaging Study of Patterns of White Matter Tract Involvement in Diffuse Pontine Gliomas

Hoang Tran, Claudia Hillenbrand, M. Scoggins, R. Ogg, N. Phillips, K. Helton, Z. Patay, A. Broniscer, St. Jude Children's Research Hospital
Faculty Sponsor: Ann Viano, Department of Physics

Diffuse pontine gliomas (DPG) are lesions that account for 15% of pediatric central nervous system tumors. Prognosis is poor for patients with DPG, and effective therapy for these tumors is lacking. Conventional magnetic resonance (MR) imaging can assess tumor location and response to therapy, but cannot determine tumor involvement in major white matter tracts in the pons. New MR imaging techniques were used to measure apparent diffusion coefficients (ADC) in diffusion tensor images (DTI). ADC is a quantitative value for diffusion and indicates cell growth and vitality. Since DPG are fast growing tumors, ADC values for these cells are high but decrease to normal values with radiation treatment. Results show three groups for ADC values as a function of RT: (1) respond and stabilize, (2) respond and relapse, and (3) no response. Group 1 shows decreasing and then stabilizing ADC in response to treatment. Group 2 shows initial decrease of ADC values followed by an increase after several months. Group 3 shows no change in

ADC values. In summary, tract involvement and ADC values correlate with treatment course. ADC values respond to the start of treatment and show no change when treatment is not effective.

#52 Mutating PAX3-FOXO1 to understand its regulation and its role in alveolar rhabdomyosarcoma tumorigenesis

Anthony Chiang, David Bouck, Taosheng Chen, St. Jude Children's Research Hospital
Faculty Sponsor: Darlene Loprete, Department of Chemistry

Rhabdomyosarcoma (RMS) is a common childhood soft tissue cancer associated with skeletal muscle lineage. Alveolar rhabdomyosarcoma (ARMS), a type of RMS, is characterized by the presence of PAX3-FOXO1, the fusion gene produced by (2;13) (q34;q14) chromosomal translocation. PAX3-FOXO1 is a chimeric transcription factor, containing the DNA binding domain of PAX3, and the transcriptional activation domain of FOXO1. To identify the PAX3-FOXO1 domains or single amino acid that regulated the localization or activity of the fusion protein, we performed site-directed mutagenesis of PAX3-FOXO1. We targeted amino acids that are known or predicted phosphorylation sites, as well as domains predicted to affect nuclear import of the protein. Plasmids bearing mutated GFP-PAX3-FOXO1 were then transfected into multiple cell lines, including the ARMS RH30. We used fluorescence microscopy to determine the localization of each mutant. In future studies, we will measure the activity of mutated PAX3-FOXO1 using luciferase-based reporter assays. These results will be useful in understanding the regulation of PAX3-FOXO1 and its role in ARMS tumorigenesis.

#53 A phosphomimetic mutation at threonine-40 abolishes transactivation activity of human vitamin D receptor in HepG2 liver carcinoma cells

Alexander Tong, Satyanarayana Pondugula, Taosheng Chen, St. Jude Children's Research Hospital
Faculty Sponsor: Darlene Loprete, Department of Chemistry

Vitamin D Receptor (VDR) is a member of the nuclear receptor (NR) family of ligand-activated transcriptional factors. VDR and pregnane X receptor (PXR), another NR, belong to the same subfamily of NRs. VDR plays important roles in several physiological processes. However, the signaling mechanisms responsible are not fully understood. It has been shown that a phosphomimetic mutation at threonine-57 in human PXR abolishes its transactivation activity. We therefore wanted to investigate whether a phosphomimetic mutation at threonine-40 (T40), which is a consensus site of threonine-57 in human PXR, affects the transactivation activity of human VDR (hVDR) in HepG2 cells. Site-directed mutagenesis was performed to generate phosphorylation-deficient alanine (A) (hVDRT40A) and phosphomimetic aspartate (D) (hVDRT40D) mutants. Cell-based gene reporter and Western blotting assays were used to study cytochrome P450 3A4 (CYP3A4) promoter activation and protein expression levels of the hVDR mutants, respectively. hVDRT40D, but not hVDRT40A, lost its transactivation activity. Neither mutation altered hVDR's protein expression levels, suggesting that mutant proteins are as stable as wild-type hVDR and that loss-of-function of the phosphomimetic mutant (hVDRT40D) was not because of reduced protein expression levels. Our studies identify a functionally-significant phosphomimetic mutant (hVDRT40D) to support the notion that phosphorylations regulate hVDR function.

#54 The Transformation of Rbl-10 Retinoblastoma Cells by Transfection of Pluripotency-Inducing Genes

Zachary Morgan, Samantha Cicero, Michael Dyer, St. Jude Children's Research Hospital
Faculty Sponsor: Jay Blundon, Department of Biology

Induced pluripotent stem cells (iPS) are experimentally derived pluripotent cells made by the retroviral transfection of four pluripotency-related genes. Our goal is to take immortalized cells, which have previously not been studied in this context, through the iPS protocol. We propose that cells of a mouse retinoblastoma cell line may have some characteristics of cells of the retina, but fall between differentiated cells and embryonic stem cells (ESCs) or iPS on a spectrum of differentiation. We hypothesize that the transfection of the four iPS pluripotency factors will reprogram the cells toward a more iPS (ES-like) state. One week after transfection, we will harvest the cells for RNA on a weekly basis for a four week period--the time that it takes to produce iPS cells after transfections. We will determine the molecular profile of the

iPS-transfected retinoblastoma cells with qRT-PCR and compare with controls. Our initial results suggest that the retinoblastoma cells did not de-differentiate. The expected increase in pluripotency markers and decrease in differentiation/progenitor markers was not observed. The immortalized nature of the cells may make them resistant to de-differentiation. In the future we plan to further our qRT-PCR characterizations with immunolabeling, and continue to experiment with new techniques to induce de-differentiation.

#55 Benzil Based Inhibitors of Carboxylesterases

Elizabeth Parkinson, JL Hyatt, LD Hicks, MJ Hatfield, CC Edwards, B Yang , PM Potter, St. Jude Children's Research Hospital
Faculty Sponsor: Loretta Jackson -Hayes, Department of Chemistry

Carboxylesterase enzymes(CE) are ubiquitous proteins in human and animal tissues responsible for the hydrolysis of carboxylic esters into alcohols and carboxylic acids. Carboxylic esters include clinical drugs like the anticancer drug irinotecan(CPT-11). CPT-11 is hydrolyzed to its active metabolite(SN-38) which is responsible for killing tumor cells. However, high levels of CEs in the intestine produce high concentrations of SN-38, resulting in diarrhea, the dose limiting toxicity. Identifying CE inhibitors which could ameliorate this toxicity may have clinical utility. Previously, benzil was found to be a potent inhibitor of CEs, in vitro and in mammalian cells. In this study, we have synthesized and determined the ability of benzil derivatives to inhibit CEs in vitro. By inserting different atoms between the benzene ring and 1,2-dione moiety, it was determined that the inhibitory power depended upon the polarity and hydrophobicity of the inserted atom. By replacing the phenyl groups with alkyl chains of increasing length, increasing potency of inhibition was observed. The alkyl derivatives also demonstrated intracellular inhibition of CEs in mammalian cells and were potent inhibitors of CE-mediated CPT-11 hydrolysis. Potentially, these alkyl dione CE inhibitors represent a new class of compounds that could be used to reduce the toxicity of CPT-11.

#56 PB1-F2 Influences the Polymerase Activity in Influenza A Viruses

Jiyuan Zhang, Julie McAuley, Jon McCullers, St. Jude Children's Research Hospital
Faculty Sponsor: Terry Hill, Department of Biology

The negative-sense RNA genome in the influenza A virus encodes for at least 11 viral proteins, allowing the virus to combat the host's immune system by antigenic drift. The PB1-F2 gene sequence has been hypothesized to influence the polymerase activity of the influenza A virus through co-localization of the C-terminal region of PB1-F2 protein with the PB1 protein. Using the Promega Luciferase Assay System, experiments measured the luciferase levels of the polymerase activity of the minigenome system. The minigenome system included the various RNA viral plasmids PB2, PA, NP and PB1 that were mixed and transfected simultaneously in vitro into different cell lines. The different PB1 virus strains included wildtype A/Puerto Rico/8/34 (PR8), A/Brevig Mission/1/1918 (1918), A/Beijing/11/56 (Beijing) and PB1-F2 in PR8 background, H5N1 and H3N2. Results showed that the wildtype PR8 had more efficient viral replication than 1918, Beijing and PB1-F2. We conclude that PB1-F2 does not drastically affect the polymerase activity or the replication of the influenza A virus. Results of this project can be used to further understand the functions of PB1-F2.

POSTER SESSION II

McCallum Ballroom, 4:00 pm – 6:00 pm

Lynx Genome Project

#1 Lynx Genome Project
Caroline Faulk, Lane Lovett, Allister Wilton
Faculty Sponsor: Gary Lindquester, Department of Biology

#2 Lynx Genome Project
Thomas Hamilton, Sarah Henkel, Stephanie Olds
Faculty Sponsor: Gary Lindquester, Department of Biology

#3 Lynx Genome Project
Mary Elizabeth Huddleston, Shan Khan, Tyler Snedden
Faculty Sponsor: Gary Lindquester, Department of Biology

#4 Lynx Genome Project
Jessica Johnson, Laura Johnson
Faculty Sponsor: Gary Lindquester, Department of Biology

#5 Lynx Genome Project
Chang Liu, Dustin Long, Anne Tufton
Faculty Sponsor: Gary Lindquester, Department of Biology

#6 Lynx Genome Project
John Musgrove, Mya Santos, Mandy Shum
Faculty Sponsor: Gary Lindquester, Department of Biology

Biology II Laboratory

#7 Stomatal Density of Petals Compared to Leaves in Magnolia Tree
Kelly Allison, Ted Boozalis, Ashley Ladd, Lauren Schully
Faculty Sponsor: Carolyn Jaslow, Department of Biology

#8 Rate of Stomata Opening from Bottom to Top
Logan Benoist, Catherine Bordelon, Hana Bucholz, Katherine DiGiovanni, Landon LaSalle
Faculty Sponsor: Carolyn Jaslow, Department of Biology

#9 The Effect of Hydration and Wind on Stomata Opening
Cintara Bradley, Rebecca Donachie, Erin Dressel, Haley Pope, Cameron Whitaker
Faculty Sponsor: Carolyn Jaslow, Department of Biology

#10 The Effects of Wind on Stomatal Openings on the Abaxial Surface of Leaves
Rush Brady, Jay Newman, Megan O'Brien, Stephanie Sermonet
Faculty Sponsor: Carolyn Jaslow, Department of Biology

#11 Do Differences in Pincer Size Affect Fight Frequency More Than Differences in Body Size in Procambarus clarkii?
Christian Butler, Ryan Costello, Tyler Fraser, Simone Simmons
Faculty Sponsor: Carolyn Jaslow, Department of Biology

#12 Stomata Density Decreases with Increased Proximity to Traffic
Michael Castellarin, Holly Edwards, Katelyn Foster, Emily Hays
Faculty Sponsor: Carolyn Jaslow, Department of Biology

#13 The Effect of Different Wavelengths of Light on the Gross Production of Aquatic Plants
Jeanine Claiborne, Andrea Perkins, Sasha Ray, David Thomas
Faculty Sponsor: Carolyn Jaslow, Department of Biology

#14 The Effects of Residency on Dominance Coefficients in Crayfish
Martha Emelue,Jennifer Kotrady, Melody Lopez, Sarah Tchang
Faculty Sponsor: Carolyn Jaslow, Department of Biology

#15 Crayfish Color Preference
Arden Holbein, Anna Magliolo, Salar Rafieetary, Kelsey Smith
Faculty Sponsor: Carolyn Jaslow, Department of Biology

#16 Difference in Stomata Density based on Leaf Location
Margaux Anbouba, Lindsey Gurkovich, Rachel Hickey, Katie Morgan, Michelle Shroyer
Faculty Sponsor: Carolyn Jaslow, Department of Biology

#17 Effects of Snails on Oxygen Concentration in a Mesocosm
Shayan Ahmed, Zoe Clark, Sarah Kennedy
Faculty Sponsor: David Kesler, Department of Biology

#18 The Effects of Acidity in Precipitation on the Opening and Closing of Stomata
Lindsey Akers, Ruth Allard
Faculty Sponsor: David Kesler, Department of Biology

#19 The Patterns of the Stomata Opening Can be Predicted by the Time of Day
Jayme Araneda, Reed Beazely, Austin DeBeaux, Brad Pennington, Philip Lyons
Faculty Sponsor: David Kesler, Department of Biology

#20 The Correlation Between the Rate of Stomata Opening and Available Water
Meredith Hicks, Alex Nord, Amanda Sandifer, Jasdev Singh, Michael Wisner
Faculty Sponsor: David Kesler, Department of Biology

#21 Effect of pH on the Growth of Bean Sprouts
Laura Atkinson, Aya Kato, Geewon Paeng, Van Phan
Faculty Sponsor: Terry Hill, Department of Biology

#22 Will the Absence of Dark Shelter Affect the Behavior of Crayfish?
Aaron Kala, Travis Lux, Travis Perkins, Ferrell Varner
Faculty Sponsor: Terry Hill, Department of Biology

#44 Aggressive Behavior in Male Crawfish Increases with Food Source Present
Will Hawes, Brianna Hoge, Morgan Slevin
Faculty Sponsor: Terry Hill, Department of Biology

#50 The Effect of Acid on Photosynthesis and Cellular Respiration of Aquatic Plants
Farrell Diliberto, Macie Lunyong, Allen Reed, Diana Wong
Faculty Sponsor: Terry Hill, Department of Biology

#57 The Gross Production Differences and Dominance Concerning Pistia and Elodea
Ginny Brady, Kara Holifield, Jasmin Mayen
Faculty Sponsor: Terry Hill, Department of Biology

#58 Prior Habitation of Female Crayfish in a Localized Water Source Reduces Agonistic Behavior Between two Male Crayfish Introduced Into the Environment
Dan Eastlack, Anna Kolobova, Keshav Kukreja, Chris Moore
Faculty Sponsor: David Kesler, Department of Biology

#59 Stomatal Densities in Holly Trees in Varying Levels of Urbanity around Memphis
Amber Coble, Jake Groves, Auriel Person, Ben Speidel
Faculty Sponsor: David Kesler, Department of Biology

#60 The Effects of Temperature on Male Crayfish Activity
Lindsey Bierle, Claire Gellrich, Punam Patel, Chris Rose
Faculty Sponsor: David Kesler, Department of Biology

#61 The Effect of Prior Trauma on Agonistic Behaviors in Crayfish
Steven Johanson, Haley Johnson, Brianna Smith, David Siu
Faculty Sponsor: David Kesler, Department of Biology

#62 Effects of Red and Blue Light upon Stomatal Aperture of Pansies
Chris Bell, Barrett Huggins, Madeline Jeansonne, Evan Savage
Faculty Sponsor: David Kesler, Department of Biology

Biology

#23 Age and growth structure of the Largemouth Bass (Micropterus salmoides) population in Garner Lake, Tennessee

Brett Miller
Faculty Sponsor: David Kesler, Department of Biology

Largemouth bass (Micropterus salmoides) are a highly sought after freshwater game fish abundant throughout the continental United States. Bass are versatile in their demographics and reside in reservoirs, rivers and wetlands. One such habitat is Garner Lake, a 270 acre western Tennessee reservoir with strict fishing regulations. To understand how fishing pressure affects largemouth bass growth and population structure, fish scales were analyzed. Fish were collected with traditional catch and release angling methods and scales were obtained from below the anterior edge of the dorsal fin with forceps. The weight and length of each fish were also determined. Acetate impressions of the scales were made with a Fish Scale Press, and viewed under microscopes using digital imaging technology. Locating annuli on the scales allowed the determination of age and growth history. Lengths at previous ages and the growth of were calculated with a standard fisheries management back-calculation technique, the Fraser-Lee equation. These data allow a description of changes in growth and population structure of largemouth bass in Garner Lake as impacted by a massive fish die-off in the summer of 2008. These data are also compared with bass age/growth data from reservoirs with less regulated fishing.

#24 Plasmodium falciparum and Human Immunodeficiency Virus -1: Co-infection and coexistence in sub-Saharan Africa.

Claire Litherland
Faculty Sponsor: Gary Lindquester, Department of Biology

Plasmodium falciparum and Human Immunodeficiency Virus -1 are two very different pathogens, each having a distinct life cycle, mode of transmission and pathogenesis within a human host. Despite their dissimilarities, these two microbes geographically overlap in the sub-Saharan African region. The problems arising from co-infection are numerous; HIV-1 positive individuals suffer from more, and more severe, episodes of clinical malaria resulting from advancing immunosuppression. Conversely, it has been demonstrated that the viral loads of HIV-1 positive patients infected with malaria increase as a result. In-vitro studies exploring this relationship have indicated that the immunological response elicited by the host in response to malaria, encourages HIV-1 viral replication, accelerating the progression of HIV-1. With this anticipated correlation in mind, I am using a regression model to analyze the population level effects that the two diseases have on life expectancy and adult mortality using cross sectional health and population data from 43 African nations. Due to the high prevalence of both pathogens in sub-Saharan Africa, any interaction promoting their spread or worsening their progression would be a serious public health concern.

#25 Expression Analysis of MicroRNAs Affecting Pediatric Cancer Cell Lines

Tyler Snedden, Jaclyn Hung, Gail Tomlinson, Patricia Sanchez-Diaz, Mimi Chang, The University of Texas Health Science Center
Faculty Sponsor: Gary Lindquester, Department of Biology

Small, noncoding RNAs called microRNAs, have been shown to regulate oncogenesis, which is closely associated with tumorigenesis and the development of cancer. Our lab has focused on two specific microRNAs, Let-7 and microRNA-21. Let-7 is a negative regulator of RAS, which causes oncogenesis when overexpressed. MicroRNA-21 targets an oncogene called PTEN, and its overexpression leads to tumorigenesis. Our lab performed a microarray experiment which quantitatively examines the relative expression of a large subset of microRNAs in different cell types. We believed there was a flip in the data where two cell types were accidentally mislabeled as one another. I used stem-loop reverse transcription, real-time quantitative polymerase chain reaction assay to confirm the "flip" by measuring the quantitative relative expression of microRNAs in the two types of DAOY cells, DAOY monolayer and DAOY neurospheres. Monolayer cells represent normal, controlled cell growth whereas neurospheres are grown by using growth factors to stimulate the clumping of DAOY cells to simulate cancer stem-like cell growth.

The results showed significant overexpression of the two microRNAs in neurospheres compared to monolayer cells, which confirms the microarray data flip and also supports the notion that these two microRNAs when overexpressed promote tumorigenesis and the development of cancer.

#26 The Effect of Angiotensin II on Blood Pressure, Stroke Volume, Heart Rate, and Urine Output after the Application of AT1 and AT2 Antagonists

Emily Burford, Andrea Hassink, Logan Eberly
Faculty Sponsor: Jay Blundon, Department of Biology

Angiotensin II is a hormone that acts on a variety of receptors and is vital to increasing blood pressure and water reabsorption, decreasing urine output by increasing vasopressin secretion, thirst stimulation, direct vasoconstriction, sympathetic nervous response, cardiac output, and stimulation of the adrenal cortex to secrete aldosterone. Activation of the AT1 receptor will result in vasoconstriction, aldosterone synthesis and secretion, increased vasopressin secretion, and increase in noradrenergic activity. Activation of the AT2 receptor produces effects that counter the effects produced by the activation of the AT1 receptor. Our study sought to determine how the aggregate effects of ANG II on blood pressure, stroke volume, heart rate, and urine output were affected by inhibition of AT1 or AT2 receptors, or both. Our results show that ANG II increases blood pressure and stroke volume, and has antidiuretic effects. Because blockage of AT1 receptors causes a decrease in blood pressure and stroke volume, it can be concluded that AT1 receptors activate the cell pathways that produce these responses to ANG II. AT2 receptors do not play a visible role in producing the aggregate response of ANG II, but instead appear to serve as activators of responses that moderate those of AT1.

#27 Correlation of seed size with fitness traits in Arabidopsis thaliana: An Analysis of Columbia and Landsberg Ecotypes

Nadia Winston
Faculty Sponsor: Jonathan Fitz Gerald, Department of Biology

Seed size is often thought to be a major contributor to plant fitness and the variation in seed size is common both within and among plant species. Often, larger seeds provide more resources to the early seedling which can aid in early growth. However, genetic variation for seed size may be reduced or eliminated by the roles of natural selection on other plant traits. In this trial, seed size and plant fitness data were correlated between Columbia (Col) and Landsberg (Ler) wild-type strains and their recombinant offspring. Col seeds are typically larger than Ler seeds, and this correlates with a larger plant size in the Col lines. In the recombinant offspring, data suggested initial seed size correlated with the time of germination and seedling growth rate, but not other fitness traits including seeds per fruit, height, branching, shoots, and number of fruits. We can conclude that seed size can be genetically separated from final plant size and other fitness traits. These results may have bearing on breeding strategies in agriculture.

#28 GlobeMed at Rhodes

Shannon Fuller, Jamison Beuerman, Brent Butgereit, Maria Cartagena, Allison Dove, Sarah Endres, Katelyn Foster, Caroline Lee, Dev Varma, Kyle Wukasch, Jiyuan Zhang
Faculty Sponsor: Jonathan Fitz Gerald, Department of Biology

GlobeMed is a non-profit organization with chapters at 18 colleges across the country. Since it was founded last fall, GlobeMed at Rhodes has selected an Executive Board, sent two students to a leadership training conference at GlobeMed's national office, and facilitated thoughtful discussions about issues surrounding global health. A group of five students will attend GlobeMed's annual global health conference in early April to represent the Rhodes chapter, attend lectures, and participate in workshops. Our chapter recently solidified a partnership with AMOS, a grassroots organization based in Nicaragua whose mission is to improve the health in rural areas by empowering community leaders and advocating for sustainable change. A group of 3-5 Rhodes students will travel to Nicaragua this summer for 3 weeks to conduct an ethnographic study and a collaborative needs assessment with AMOS staff. During the needs assessment, participants will identify future long-term projects GlobeMed can help with both on-site and during the academic year. The partnership will be mutually beneficial. In the process of working with

AMOS, members will learn how they can effectively and responsibly address public health issues in developing countries, and hopefully become future global health leaders.

#29 Recombinant Expression of Plasmodium falciparum reticulocyte homology 4 (PfRH4) protein

Shannon Fuller

Faculty Sponsor: Laura Luque de Johnson, Department of Biology

The apical complex region of Plasmodium spp, the intracellular parasite which causes Malaria, has been shown to play a critical role in the invasion process of the host's erythrocytes. Composed of organelles that secrete substances during different stages of the invasion process, the apical complex may be an effective area for drug targeting. One such organelle is the rhoptry. Upon binding to the red blood cell, the rhoptry secretes several proteins that ultimately lead to the entry of the Plasmodium into the erythrocyte. Plasmodium falciparum reticulocyte homology 4 (PfRH4) protein has been shown to play a crucial role in entry. However, little is known about the biochemistry and structure of this protein. Given that endogenous expression of Plasmodium proteins occurs at low concentrations, a heterologous expression of PfRH4 was performed. Recombinant PfRH4 was cloned and expressed in bacterial cells using a plasmid vector. A high concentration of the protein was obtained and it was later purified using affinity chromatography. Once a purified protein is obtained, biochemical and structural analysis will be performed to characterize the protein in an effort to identify potential drug targets.

#30 BRO1 Dependent Function of the G1 Cyclin Cln3 in S. cerevisiae

Brett Dagen

Faculty Sponsor: Mary Miller, Department of Biology

The cell division cycle is a highly regulated process that is essential for proper replication of a cell. The cyclin Cln3 regulates passage from G1 to S phase by binding to and activating Cdc28. Proper Cln3 function requires nuclear localization which depends on a bipartite type nuclear localization signal (NLS). Previously, Dr. Mary Miller, in collaboration with Dr. Brenda Andrews (University of Toronto, Canada), identified 19 genes involved in Cln3 NLS activity. Of these, eight were found to be important for Cln3 dependent viability. In these experiments, we have identified BRO1 as important for both Cln3 NLS activity and G1 cyclin function. Bro1 functions within the endosomal pathway. However, the complete cellular role of Bro1 is unclear, and it has been shown to have other genetic interactions. Our data suggest a role of Bro1 in regulated cell division.

Neuropsychology

#31 The Effect of Direct and Indirect Stereotype Threats on Heart Rate and Performance on Spatial Reasoning Tests

Martha Rotzoll, Stephanie J. Wilson, Erika K. Reckert, Alexandra M. Nobel, Elizabeth Lee Berry, and Sarah E. Barowka

Faculty Sponsor: Jeffrey Sable, Department of Psychology

Performance suffers when one feels threatened by a negative stereotype of one's group. Physiological arousal may mediate this effect. We believe that by presenting indirect stereotype threats, the same level of arousal may be achieved as that from direct stereotype threats to successfully interfere with performance on spatial reasoning tests. Participants were assigned to one of three conditions, in which they were primed (a) indirectly with offhanded remarks of expected outcomes due to the participant's gender, (b) directly with explicitly set expectations of correct responses due to the participant's gender, or (c) no prime. Participants then completed two spatial reasoning tasks (mental rotation and matrices); performance was measured by the number of correct responses given throughout each test. Arousal was quantified as heart rate (measured by electrocardiogram—EKG), and is anticipated to be highest with direct priming and lowest with no prime, with corresponding performance on both tasks. In addition, we conducted an exploratory analysis among self-reported identity features and the other variables in the study. Such research will illuminate the

strength of indirect stereotypes in the classroom and the effect they have on the stereotyped group's success.

#32 The Effects of Enriched Environment on Responses to Methylphenidate in Mice

Sarah Barowka, Lauren Brooks, Olivia Brown, Brian Darrith, Michael Hadler, Stephen Spainhour, and Rachel Trout

Faculty Sponsor: Kim Gerecke, Department of Psychology

In humans, greater physical and cognitive activity throughout life is positively correlated with prevention of neurodegenerative disorders. In addition, normal age-related declines in learning and memory are prevented by an active lifestyle; perhaps through prevention of gray matter loss and improvement in neuronal efficiency. In animals, this effect can be modeled using and enriched environment (EE), which incorporates enhanced social, learning and exercise elements into the living environment. Exposure to EE has been shown to increase neuron size, length of dendrites, spine numbers and synaptic density in rodent brains. The effects of EE on dampening drug seeking behavior is poorly understood; however, recent research has indicated that EE can dampen morphine-induced reward and subsequent drug seeking behavior (Xu et al., 2007). In addition, much still remains to be understood concerning the abuse potential of amphetamine-like stimulants (i.e., Methylphenidate [MPH; trade name Ritalin]), drugs that are widely prescribed for treatment in children with attention-deficit hyperactivity disorder (ADHD). This research will investigate whether EE blocks any addictive effects of MPH in mice using the conditioned place preference model.

#33 The Protective Effects of Exercise on Neurodegeneration in the Hippocampus in Mice

Sarah Allen, Jessica Fawer and Anna Kolobova

Faculty Sponsor: Kim Gerecke, Department of Psychology

A number of environmental factors have been indicated to increase vulnerability to neurodegenerative disorders, such as Parkinson's Disease. Chronic stress triggers the release of glucocorticoids in the brain, which are known toxic factors that may cause apoptosis (cell death) in the hippocampus. Exercise has been shown to increase the secretion of protection factors that may also help to protect the brain against the toxic effects of glucocorticoids. Therefore, we hypothesize that chronic restraint stress will increase neurodegeneration in the brain as measured by apoptosis and reactive gliosis. In addition, exercise will decrease the expression of these markers and will protect against neurodegeneration. To test this, female mice were randomly assigned to standard housing (SH) or in cages equipped with running wheels (Exercise). Half of the mice from each group were exposed to chronic restraint stress for two hours each day for two weeks prior to sacrifice. To analyze the expression of toxic effects, sections of the hippocampus will be labeled for markers of apoptosis (caspase-3 and Bcl-x) and glial activation (GFAP) using immunohistochemistry techniques. We predicted that chronic restraint stress would induce toxic effects in the hippocampus and that exercise would protect against these effects.

Chemistry & Biochemistry

#34 Tightly regulated expression of the PkcA and SccA genes by the inducible AlcA promoter affects both development and cell wall integrity in Aspergillus nidulans

John Musgrove, Erinn Ogburn, Mohammad Atiq

Faculty Sponsor: Darlene Loprete, Terry Hill, Loretta Jackson-Hayes, Department of Chemistry and Biology

Fungi are eukaryotic microorganisms of great economic, medical, and environmental significance. For example, infections involving Aspergillus fumigatus in immunocompromised patients cause aspergillosis, which can be fatal and difficult to treat. Within A. nidulans, the protein PkcA (protein kinase C) plays an integral role in cell wall metabolism – especially during septum formation and hyphal tip extension. In

addition, the integral membrane protein SccA is a multicopy suppressor of the calC2 mutation in PkcA. In studies of basic protein function, a gene can be deleted to determine its importance. However, replacing a gene's promoter with the tightly regulatable AlcA promoter establishes a conditional gene expression system that can be used to further elucidate a gene's function. In this study, we placed both PkcA and SccA under the control of the AlcA promoter to study the importance of these proteins in development and cell wall integrity. Strains in which PkcA expression is reduced have severely stunted growth and decreased wall integrity. Reduced expression of SccA has no effect on vegetative growth, but both wall integrity and asexual sporulation are reduced.

#35 Creation of an alcA/ riboflavin cassette for studying genes in the fungus Aspergillus nidulans

Lindsey Gurkovich, Jacki Ward
Faculty Sponsor: Darlene Loprete, Terry Hill, Loretta Jackson-Hayes, Department of Chemistry and Biology

One goal of the lab is to over or under express certain genes and determine their effect on the localization of protein kinase C in the fungus Aspergillus nidulans. We can accomplish this by inserting the inducible promoter, alcA in front of the gene. Therefore, we created a plasmid containing the alcA promoter and the gene for riboflavin biosynthesis (ribA) from Aspergillus fumigates which is used for selection. In order to create a cassette containing the alcA promoter and ribA, each piece of the cassette must be inserted into a plasmid, pBluescript. RibA was PCR amplified from A. fumigatus genomic DNA, digested with the restriction enzymes Not1 and EcoR1 and gel purified. pBluescript was digested with the same enzymes and gel purified. The pBluscript and the PCR amplified ribA gene were ligated and the mixture was used to transform E.coli. The clones were tested for the insertion by digestion and electrophoresis. One clone (pJW1) was chosen for the ligation of the alcA promoter. The alcA promoter was PCR amplified from pON24, digested with BamH1 and Not1. pJW1 was digested with the same enzymes and gel purified. We are currently ligating pJW1 and the alcA promoter.

#36 REAL-TIME REVERSE TRANSCRIPTASE PCR used for mRNA gene expression in filamentous fungus Aspergillus nidulans

Chassidy Groover
Faculty Sponsor: Loretta Jackson-Hayes, Terry Hill, Darlene Loprete, Department of Chemistry and Biology

The goal of our laboratory is to understand the mechanisms involved in cell wall metabolism in filamentous fungi. Currently, the lab is examining by Real-time reverse transcriptase PCR the differential mRNA expression of two putative Aspergillus nidulans mannose transporter genes that we have shown to complement Calcofluor White hypersensitivity and hyperbranching in a mutant A. nidulans strain. This technique combines reverse transcription and DNA amplification by polymerase chain reaction (PCR) creating fluorescent products whose production is monitored in real time. Here we show the differences in GmtA and GmtB mRNA expression during hyphal development.

#37 Time-lapse Video Microscopy of a Golgi Apparatus Protein in Aspergillus nidulans

Rachel Hickey
Faculty Sponsor: Terry Hill, Loretta Jackson-Hayes, Darlene Loprete, Department of Biology and Chemistry

Fungi are important because they are useful symbionts of most plants, major industrial microbes, and significant pathogens, and they can be easily manipulated. They need to be studied at the cellular level because they are microbes. Recently our lab identified GmtA as a protein playing a role in morphogenesis and wall integrity. Mutations in GmtA disrupt the development of the organism's shape and significantly decrease the integrity of the cell wall. A GFP chimera of GmtA was expressed and the fusion protein localized to punctae and organelles with a hollow, circular shape. These organelles were interpreted as cisternae of the Golgi apparatus. Golgi cisternae are assumed by most workers to migrate towards the extending apex during growth. To investigate the validity of this assumption, GFP-positive structures are

being observed via fluorescence time-lapse video-microscopy. Preliminary evidence indicates that the hollow-appearing organelles are in fact highly stable during hyphal growth while smaller punctate structures are mobile. We are currently carrying out high-speed video records of both types of organelles to determine whether their net motion is tipward or random.

#38 CDC14 Homologue Found to Play Integral Role in Septa Formation in A. nidulans

Erinn Ogburn, Brittany Chavez
Faculty Sponsor: Terry Hill, Loretta Jackson-Hayes, Darlene Loprete, Department of Biology and Chemistry

Fungi, such as Aspergillus nidulans, are important microorganisms that act as both harmful pathogens as well as acting in essential and beneficial roles. In order to better understand the life cycle of fungi, their unique cell cycle must be understood, especially the process of cytokinesis. An important feature of cytokinesis of fungi is the formation of a septum in which the cell wall grows inwardly to support the growth of the fungus. It has previously been documented that Protein Kinase C (PKC) plays a role in septa formation. CDC14 is a phosphatase, found in S. cerevisiae, which has a homologue in A. nidulans, AN5057.3. We hypothesize that the CDC14 homologue works with PKC in forming the septa in A. nidulans. In order to observe the role CDC14 has in septa formation and the relation it has with PKC, the CDC14 homologue was tagged with a fluorescent marker, GFP. Using the marker, the localization of CDC14 was observed in both the nucleus and the newly forming septa, supporting the hypothesis of CDC14 homologue's connection to PKC in septa formation. Further research on the relationship PKC and CDC14 homologue will be performed including observations on timing of localization.

#39 Identification of two novel septation mutants in the fungus Aspergillus nidulans

Miranda White, Ke Shang
Faculty Sponsor: Terry Hill, Loretta Jackson-Hayes, Darlene Loprete, Department of Biology and Chemistry

The study of fungi is essential to science because they are so useful. Pharmaceuticals, antibiotics and some renewable fuels are all made from different fungi. In addition, many fungi can cause diseases. In order to find cures, we need to understand the basic biology of fungi. Cytokinesis is essential to fungal growth. Cytokinesis involves the formation of a cell wall or a septum to divide a cell into compartments. We are currently studying strains of Aspergillus nidulans mutants that are unable to form proper septa. These mutants were confirmed through fluorescence microscopy. Once true septation mutants were found, they were crossed with each other and to a small set of previously identified septation mutants. This allowed us to determine if the mutation was previously identified or if it was a new septation mutant. We have discovered two new septation mutants through our crossing experiment. In the future, we plan to examine their effect upon the localization of other proteins known to play a role in septation.

#40 Evaluating various SPME fibers for extracting explosive residues

Rob Peeler, Philip Gennette, Taylor Phelps
Faculty Sponsor: Jon Russ, Department of Chemistry

Solid phase micro-extraction (SPME) coupled with a gas chromatograph with an electron capturing detector (GC-ECD) was used to detect trace amounts of gas-phase explosive residues. Our primary goal was to test the efficiency of four different types of SPMEs for the absorption of 2,4-DNT under various conditions. The four SPME's selected were Polydimethylsiloxane /Divinylbenzene (PDMS/DVB), Carbowax/Divinylbenzene (CW/DVB), Polyacrylate, and Polyethylene Glycol (PEG) fibers. To simulate an open air extraction, we constructed a wind-tunnel using a 3 m long by 0.3 m diameter PVC pipe with a fan on one end and the other extending into a fume hood. A heated mixture of sand and DNT (around 1% DNT by mass) was placed in front of the fan to create DNT vapors. In order to vary the extraction conditions, a virtual impactor (VI) was placed within the wind-tunnel. This VI was attached to a vacuum pump by means of a 0.25 cm stainless steel tube; along this line we were able to control for humidity, temperature, and air flow. The information we obtain will allow informed decisions to be made with regard

to which type of SPME that should be employed in devices used to detect explosives in open air environments.

#41 Dispersion and induction forces in serotonin synthesis: DFT and ab initio results

Caroline Lee

Faculty Sponsor: Mauricio Cafiero, Department of Chemistry

Weak dispersion interactions are important in the binding of aromatic ligands to enzymes. Our previous work has shown that mutations in a single residue at a protein active site can have deleterious effects on protein function. In this work, we study the weak interactions between an aromatic residue (residues HIS778, HIS668, HIS192, and PHE785) in amino acid decarboxylase and an aromatic ligand, pyridoxal phosphate (PLP), using second order Moller-Plessett perturbation theory and several Density Functional Theory methods. We also study the weak interactions with the ligand that result when this residue is mutated to all nineteen other amino acids. Further, we study how the gradient correction to GGA Density Functional Theory methods depends on the size of the side chain of the residue being studied. We start with the crystal structure of wildtype amino acid decarboxylase and perform in silico mutations at the above locations to arrive at mutant residue-ligand pairs which we examine for hydrogen bonds, dispersion, and other van der Waals interactions. We group our analysis of these interactions in two ways: by size of the side chains, and also by characteristic groups (polar, non-polar, etc). We find that different Density Functional Theory Methods are able to approximate MP2 interaction energies for different types of systems, though no one DFT is generally applicable.

#42 Poly(3-hexylthiophene) for Organic Photovoltaics

Anna Lovel

Faculty Sponsor: Michael Julian, Department of Chemistry

Polythiophenes are some of the most environmentally stable polymers for use in organic photovoltaics. Their electrical efficiency is controlled largely by the regularity and length of the polymer, both of which can be controlled through synthesis. In 1999, Loewe and McCullough published a synthetic method for regioregular poly(3-alkylthiophenes) using a Grignard metathesis that produces a 99% regioregular product. This method allows for the reaction to take place at room temperature and in shorter amounts of time. Prior to 1999, polythiophenes were not an economical choice for photovoltaics; however, the introduction of the Loewe synthesis has made polythiophenes more accessible. We have followed a three-step synthetic procedure from Chaloner and Loewe and McCullough to produce poly(3-hexylthiophene). The first reaction couples 1-bromohexane and 3-bromothiophene in a Grignard metathesis to form 3-hexyl thiophene. The second reaction uses N-bromosuccinimide to place bromines in the 2 and 5 positions on the ring, creating 2,5-dibromo-3-hexylthiophene. The final polymerization step uses a Grignard metathesis and a nickel catalyst to synthesize poly(3-hexylthiophene).

#43 Nanosphere Architecture of Organic Photovoltaics

Audrey Hughes, Allister Wilton

Faculty Sponsor: Michael Julian, Department of Chemistry

Organic photovoltaic cells are cheaper to make and more environmentally friendly than silicon cells. However, organic cells degrade when exposed to light, water, and oxygen. In order for organic cells to be effective, they must be protected against the very elements they will be surrounded by when in use. By encapsulating the light, water, and oxygen sensitive parts of the cell in another environmentally stable polymer on the nanometer level, the degradation of the cell can be avoided. So far we have synthesized the charge carrying polymer P3HT poly(3-hexylthiophene) by McCullough's method, and purchased the hole polymer MEHPPV (poly[2-methoxy-5-(2'-ethyl-hexyloxy)phenylene vinylene]. We will attempt to make the nanospheres of P3HT by Keitzke's method. The P3HT is dissolved in chloroform and then dissolved in water using a soap (SDS or sodium dodecyl sulfate). An ultrasonicator will be used to create a miniemulsion of dissolved P3HT spheres, then the solvent will be evaporated off, leaving pure P3HT spheres in water and soap. We will then attempt to coat these spheres first with MEHPPV and then with the protective polymer, possibly polystyrene.

Physics

#45 A novel ultrasonic device for measuring the viscoelastic properties of fluids

Stephanie Milazzo, Jenna Smith
Faculty Sponsor: Brent Hoffmeister, Department of Physics

The goal of this project is to develop an ultrasonic measurement system that can measure the viscosity and shear stiffness of fluids. The system uses a 5 MHz shear mode quartz resonator that is swept over a range of frequencies. The center frequency and half width of the resonant response of the crystal as a function of frequency of AC voltage applied is measured. When the resonator is immersed in a fluid, the center frequency decreases and the half width increases. These changes can be analyzed to determine the viscoelastic properties of the fluid in which the resonator is immersed, if the density of the fluid is known. Measurements were made on fluids whose viscosity ranged from approximately 1-5000 centipoises and compared to measurements performed with a standard viscometer. We observe a good linear correlation between measurements made with our ultrasonic system and a standard viscometer. Viscosities determined with the ultrasonic technique, however, are generally less than viscosities measured using a standard viscometer.

#46 BINARY ORBITAL MOTION OF ELECTRICALLY CHARGED SPHERES IN WEIGHTLESSNESS

Joshua Fuchs, Brad Atkins, Gavin Franks, Lulu Li, Chase Sliger, Jennifer Thompson
Faculty Sponsor: Brent Hoffmeister, Deseree Meyer, Department of Physics

The similar mathematical forms of Coulombs' Law of Electrostatics and Newton's Law of Gravitation predict that two oppositely charged spheres should be able to move in a binary orbit about their center of mass using only the electric force as the force of attraction. To demonstrate the existence of such an orbit, we conducted an experiment in July 2008 aboard a specialized C-9B aircraft in NASA's Microgravity University Program which simulates the conditions of weightlessness. We successfully achieved multiple binary orbits between the two spheres. The orbital motion was analyzed using ImageJ software to characterize the orbital interaction of the spheres.

#47 Investigation of Gamma Ray Emissions for Palladium Isotopes

Elizabeth Hook
Faculty Sponsor: Deseree Meyer, Department of Physics

The atomic nucleus can take on a number of different shapes. In Palladium (Pd) isotopes the nucleus can take on two shapes: spherical and deformed. To study these isotopes an experiment was performed at Wright Nuclear Structure Laboratory at Yale University using the 20 MV Tandem Van de Graaff accelerator. The nuclei were produced when a beam of 12C with an energy of 70 MeV accelerated towards a target of 92Zr. Data were collected in 8 high-purity Germanium detectors situated around the Zr target. This presentation will begin by addressing basic principles of nuclear physics and will explain how we use gamma rays, or high energy photons, to determine the shape of the nucleus. Gamma rays are emitted as the nucleus de-excites to the ground state. The sequence of gamma rays emitted allows us to interpret the different quantum levels of the nucleus. The pattern of quantum levels allows us to determine the shape. Evenly spaced quantum levels indicate a nucleus is spherically shaped, and increasing spacing between quantum levels indicates the nucleus is deformed. Results for the quantum levels in 100Pd will be presented showing confirmation and extension of known levels. In the future, we will further study 101Pd to determine the quantum levels so we can infer the shape of the nucleus.

#48 Introduction to Nuclear Physics and E-GOS Method

Kelsey Dudziak
Faculty Sponsor: Deseree Meyer, Department of Physics

Nuclear Physics is a division of physics that deals with the nucleus of the atom. It is a study of the tiny particles, called nucleons, which make up the nucleus and contribute to the structure and the behavior of the nucleus. The E-GOS (E-Gamma Over Spin) method is a method that allows us to empirically determine the structure of a nucleus. We achieve this through comparisons with the ideal limits of a perfect harmonic

vibrator and axially symmetric rotor, which are known limits that help determine whether the nucleus takes a spherical shape or a deformed shape. We applied E-GOS method to the yrast bands of nuclei in the Rare-Earth region in order to verify the method because it is a well-known region of nuclei. Finally, we arranged the plots according to increasing nucleon number so that we could see the transition from vibrational to rotational nuclei.

#49 The Tasty and Delightful Shapes of Magnetic Liquids

Travis Rasor
Faculty Sponsor: Shubho Banerjee, Department of Physics

A magnetic liquid is a chaotic jumble of constantly moving magnetic particles. Generally, the particles are unable to align themselves and exert a detectable magnetic field without first transitioning into a solid. A great amount of research has been done into the creation of a liquid that is orderly (with all the particles in alignment) without becoming a solid first. Aligned magnetic liquids have been predicted theoretically, but never observed experimentally. Such a liquid would have magnetic properties and interesting applications. But what would a drop of magnetic liquid look like? Our main goal in this research was to determine the shape of a freely suspended magnetic liquid drop using computer simulations. With Surface Evolver we successfully programmed a working model of a liquid drop and determined several possible shapes for this mythical masterpiece

Rhodes – St. Jude Summer Plus Program

#51 Diffusion Tensor Imaging Study of Patterns of White Matter Tract Involvement in Diffuse Pontine Gliomas

Hoang Tran, Claudia Hillenbrand, M. Scoggins, R. Ogg, N. Phillips, K. Helton, Z. Patay, A. Broniscer, St. Jude Children's Research Hospital
Faculty Sponsor: Ann Viano, Department of Physics

Diffuse pontine gliomas (DPG) are lesions that account for 15% of pediatric central nervous system tumors. Prognosis is poor for patients with DPG, and effective therapy for these tumors is lacking. Conventional magnetic resonance (MR) imaging can assess tumor location and response to therapy, but cannot determine tumor involvement in major white matter tracts in the pons. New MR imaging techniques were used to measure apparent diffusion coefficients (ADC) in diffusion tensor images (DTI). ADC is a quantitative value for diffusion and indicates cell growth and vitality. Since DPG are fast growing tumors, ADC values for these cells are high but decrease to normal values with radiation treatment. Results show three groups for ADC values as a function of RT: (1) respond and stabilize, (2) respond and relapse, and (3) no response. Group 1 shows decreasing and then stabilizing ADC in response to treatment. Group 2 shows initial decrease of ADC values followed by an increase after several months. Group 3 shows no change in ADC values. In summary, tract involvement and ADC values correlate with treatment course. ADC values respond to the start of treatment and show no change when treatment is not effective.

#52 Mutating PAX3-FOXO1 to understand its regulation and its role in alveolar rhabdomyosarcoma tumorigenesis

Anthony Chiang, David Bouck, Taosheng Chen, St. Jude Children's Research Hospital
Faculty Sponsor: Darlene Loprete, Department of Chemistry

Rhabdomyosarcoma (RMS) is a common childhood soft tissue cancer associated with skeletal muscle lineage. Alveolar rhabdomyosarcoma (ARMS), a type of RMS, is characterized by the presence of PAX3-FOXO1, the fusion gene produced by (2;13) (q34;q14) chromosomal translocation. PAX3-FOXO1 is a chimeric transcription factor, containing the DNA binding domain of PAX3, and the transcriptional activation domain of FOXO1. To identify the PAX3-FOXO1 domains or single amino acid that regulated the localization or activity of the fusion protein, we performed site-directed mutagenesis of PAX3-FOXO1. We targeted amino acids that are known or predicted phosphorylation sites, as well as domains predicted to affect nuclear import of the protein. Plasmids bearing mutated GFP-PAX3-FOXO1 were then transfected

into multiple cell lines, including the ARMS RH30. We used fluorescence microscopy to determine the localization of each mutant. In future studies, we will measure the activity of mutated PAX3-FOXO1 using luciferase-based reporter assays. These results will be useful in understanding the regulation of PAX3-FOXO1 and its role in ARMS tumorigenesis.

#53 A phosphomimetic mutation at threonine-40 abolishes transactivation activity of human vitamin D receptor in HepG2 liver carcinoma cells

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

Faculty Sponsor: Darlene Loprete, Department of Chemistry

Vitamin D Receptor (VDR) is a member of the nuclear receptor (NR) family of ligand-activated transcriptional factors. VDR and pregnane X receptor (PXR), another NR, belong to the same subfamily of NRs. VDR plays important roles in several physiological processes. However, the signaling mechanisms responsible are not fully understood. It has been shown that a phosphomimetic mutation at threonine-57 in human PXR abolishes its transactivation activity. We therefore wanted to investigate whether a phosphomimetic mutation at threonine-40 (T40), which is a consensus site of threonine-57 in human PXR, affects the transactivation activity of human VDR (hVDR) in HepG2 cells. Site-directed mutagenesis was performed to generate phosphorylation-deficient alanine (A) (hVDRT40A) and phosphomimetic aspartate (D) (hVDRT40D) mutants. Cell-based gene reporter and Western blotting assays were used to study cytochrome P450 3A4 (CYP3A4) promoter activation and protein expression levels of the hVDR mutants, respectively. hVDRT40D, but not hVDRT40A, lost its transactivation activity. Neither mutation altered hVDR's protein expression levels, suggesting that mutant proteins are as stable as wild-type hVDR and that loss-of-function of the phosphomimetic mutant (hVDRT40D) was not because of reduced protein expression levels. Our studies identify a functionally-significant phosphomimetic mutant (hVDRT40D) to support the notion that phosphorylations regulate hVDR function.

#54 The Transformation of Rbl-10 Retinoblastoma Cells by Transfection of Pluripotency-Inducing Genes

Zachary Morgan, Samantha Cicero, Michael Dyer, St. Jude Children's Research Hospital

Faculty Sponsor: Jay Blundon, Department of Biology

Induced pluripotent stem cells (iPS) are experimentally derived pluripotent cells made by the retroviral transfection of four pluripotency-related genes. Our goal is to take immortalized cells, which have previously not been studied in this context, through the iPS protocol. We propose that cells of a mouse retinoblastoma cell line may have some characteristics of cells of the retina, but fall between differentiated cells and embryonic stem cells (ESCs) or iPS on a spectrum of differentiation. We hypothesize that the transfection of the four iPS pluripotency factors will reprogram the cells toward a more iPS (ES-like) state. One week after transfection, we will harvest the cells for RNA on a weekly basis for a four week period--the time that it takes to produce iPS cells after transfections. We will determine the molecular profile of the iPS-transfected retinoblastoma cells with qRT-PCR and compare with controls. Our initial results suggest that the retinoblastoma cells did not de-differentiate. The expected increase in pluripotency markers and decrease in differentiation/progenitor markers was not observed. The immortalized nature of the cells may make them resistant to de-differentiation. In the future we plan to further our qRT-PCR characterizations with immunolabeling, and continue to experiment with new techniques to induce de-differentiation.

#55 Benzil Based Inhibitors of Carboxylesterases

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Faculty Sponsor: Loretta Jackson-Hayes, Department of Chemistry

Carboxylesterase enzymes(CE) are ubiquitous proteins in human and animal tissues responsible for the hydrolysis of carboxylic esters into alcohols and carboxylic acids. Carboxylic esters include clinical drugs like the anticancer drug irinotecan(CPT-11). CPT-11 is hydrolyzed to its active metabolite(SN-38) which is responsible for killing tumor cells. However, high levels of CEs in the intestine produce high concentrations of SN-38, resulting in diarrhea, the dose limiting toxicity. Identifying CE inhibitors which

could ameliorate this toxicity may have clinical utility. Previously, benzil was found to be a potent inhibitor of CEs, in vitro and in mammalian cells. In this study, we have synthesized and determined the ability of benzil derivatives to inhibit CEs in vitro. By inserting different atoms between the benzene ring and 1,2-dione moiety, it was determined that the inhibitory power depended upon the polarity and hydrophobicity of the inserted atom. By replacing the phenyl groups with alkyl chains of increasing length, increasing potency of inhibition was observed. The alkyl derivatives also demonstrated intracellular inhibition of CEs in mammalian cells and were potent inhibitors of CE-mediated CPT-11 hydrolysis. Potentially, these alkyl dione CE inhibitors represent a new class of compounds that could be used to reduce the toxicity of CPT-11.

#56 PB1-F2 Influences the Polymerase Activity in Influenza A Viruses

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Faculty Sponsor: Terry Hill, Department of Biology

The negative-sense RNA genome in the influenza A virus encodes for at least 11 viral proteins, allowing the virus to combat the host's immune system by antigenic drift. The PB1-F2 gene sequence has been hypothesized to influence the polymerase activity of the influenza A virus through co-localization of the C-terminal region of PB1-F2 protein with the PB1 protein. Using the Promega Luciferase Assay System, experiments measured the luciferase levels of the polymerase activity of the minigenome system. The minigenome system included the various RNA viral plasmids PB2, PA, NP and PB1 that were mixed and transfected simultaneously in vitro into different cell lines. The different PB1 virus strains included wildtype A/Puerto Rico/8/34 (PR8), A/Brevig Mission/1/1918 (1918), A/Beijing/11/56 (Beijing) and PB1-F2 in PR8 background, H5N1 and H3N2. Results showed that the wildtype PR8 had more efficient viral replication than 1918, Beijing and PB1-F2. We conclude that PB1-F2 does not drastically affect the polymerase activity or the replication of the influenza A virus. Results of this project can be used to further understand the functions of PB1-F2.

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