

UNDERGRADUATE RESEARCH *and* CREATIVE ACTIVITY SYMPOSIUM 2012

Rhodes College

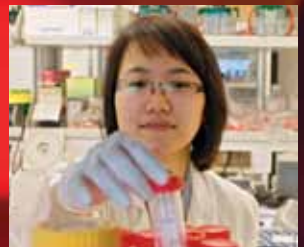
APRIL 27, 2012









April 27 Events

- Awards Convocation: 9:00am, Hardie Auditorium
- Poster Session I & Lunch Reception: 11:30am - 1:30pm, Multisports forum of the Bryan Campus Life Center
- Oral Presentation Sessions: 1:30 – 6:00pm, various locations
- Poster Session II & Closing Reception: 4:30pm - 6:00pm, Multisports forum of the Bryan Campus Life Center

Acknowledgements and Special Thanks

Student Session Chairpersons

- Kondwani Joe Banda ‘14
- Maha Bano ‘13
- Ryan Carroll ‘12
- Carolyn Drobak ‘12
- Timothy Goss ‘14
- Jasmin Mayen ‘12
- Camilla Morrison ‘14
- Nellie Moualeu ‘14
- Nguyen Huong Pham ‘14
- Caroline Philhower ‘12
- Robin Richardson ‘12
- Jerica Sandifer ‘12
- Lizzie Williams ‘14
- Anne Wilson ‘12

Robert Shatzer, Communications, URCAS Program Cover Design
Dena Selmer, Communications, Online Abstract Submissions

URCAS Planning Committee

- Nikki Cannon-Rech, Information Services Librarian
- Jeff Hamrick, Assistant Professor of Mathematics & Computer Science
- Rachel Jabaily, Assistant Professor of Biology
- Laura Loth, Assistant Professor of Modern Languages
- Laura Luque de Johnson, Assistant Professor of Biology
- Michelle Mattson, Professor of Modern Languages
- Natalie Malouf ‘12
- Gail Murray, Associate Professor of History
- Steven Samaras, Assistant Professor of Commerce and Business
- Betsy Sanders, Assistant Professor of Mathematics & Computer Science
- Karen Thomas, Departmental Assistant for Biology
- Ann M. Viano, Associate Professor of Physics, Chair URCAS Planning Committee
- Katherine White, Assistant Professor of Psychology

URCAS 2012 Presentation Sessions & Locations

11:30 am – 1:30 pm
Poster Session I & Lunch Buffet, multisports forum of the Bryan Campus Life Center
80 poster presentations from all divisions

1:30 pm
Anthropology: "Ethnography at Home" (-6:00pm), Buckman 110

1:45 pm
Black Votes and Black Power (-2:15pm), Buckman 108
Literary Images of Russia: Indomitable Cities and Villages (-2:15), Language Center
Ancient and Medieval Spain (-2:15pm), Palmer 205
Quantitative and Computational Science (-4:30pm), Frazier Jelke A

2:00 pm
St. Jude Summer Plus Fellowship (-3:15pm), Frazier Jelke B
Senior Seminar Research in Economics (-3:15pm), Kennedy 208

2:15 pm
Art: Exploring the Limits of Form (-2:45pm), Clough 410
Research in International Studies (-3:15pm), Kennedy 205

2:30pm
Conflict: War, Environmental Disaster, and Ethnicity (-3:15pm), Buckman 108
Critical Perspectives on Ethics, Oppression, and Sexuality (-3:15pm), Palmer 205
Guitar Club at "Cypress Middle School" (-3:30pm), Tuthill Performance Hall, Hassell Hall
Seeing Familiar Worlds with New Eyes: Latin American Literature and Theory (-3:45pm), Language Ctr.

3:00 pm
Art (in) Communities (-4:00pm), Clough 410
Far Away Next Door: A Documentary Film (-4:00pm), Barret 034

3:15 pm
Conservation and the Environment (-4:15pm), Frazier Jelke C

3:30 pm
Rhetoric, Politics, and the Civil War (-4:00pm), Buckman 108
Genetics, Biochemistry and Molecular Biology (-4:15pm), Frazier Jelke B
Research in the Social Sciences (-4:45pm), Kennedy 205

4:00 pm
Etudes Françaises / French Studies (-4:30pm), Language Center

4:30 pm
Video Projects from ART 166 (-6:00pm), Frazier Jelke B

4:30 – 6:00 pm
Poster Session II & Closing Reception, multisports forum of the Bryan Campus Life Center
52 Biology II and Natural Sciences poster presentations

URCAS 2012 Presentation Schedule Overview
(Locations in parentheses after each session name)

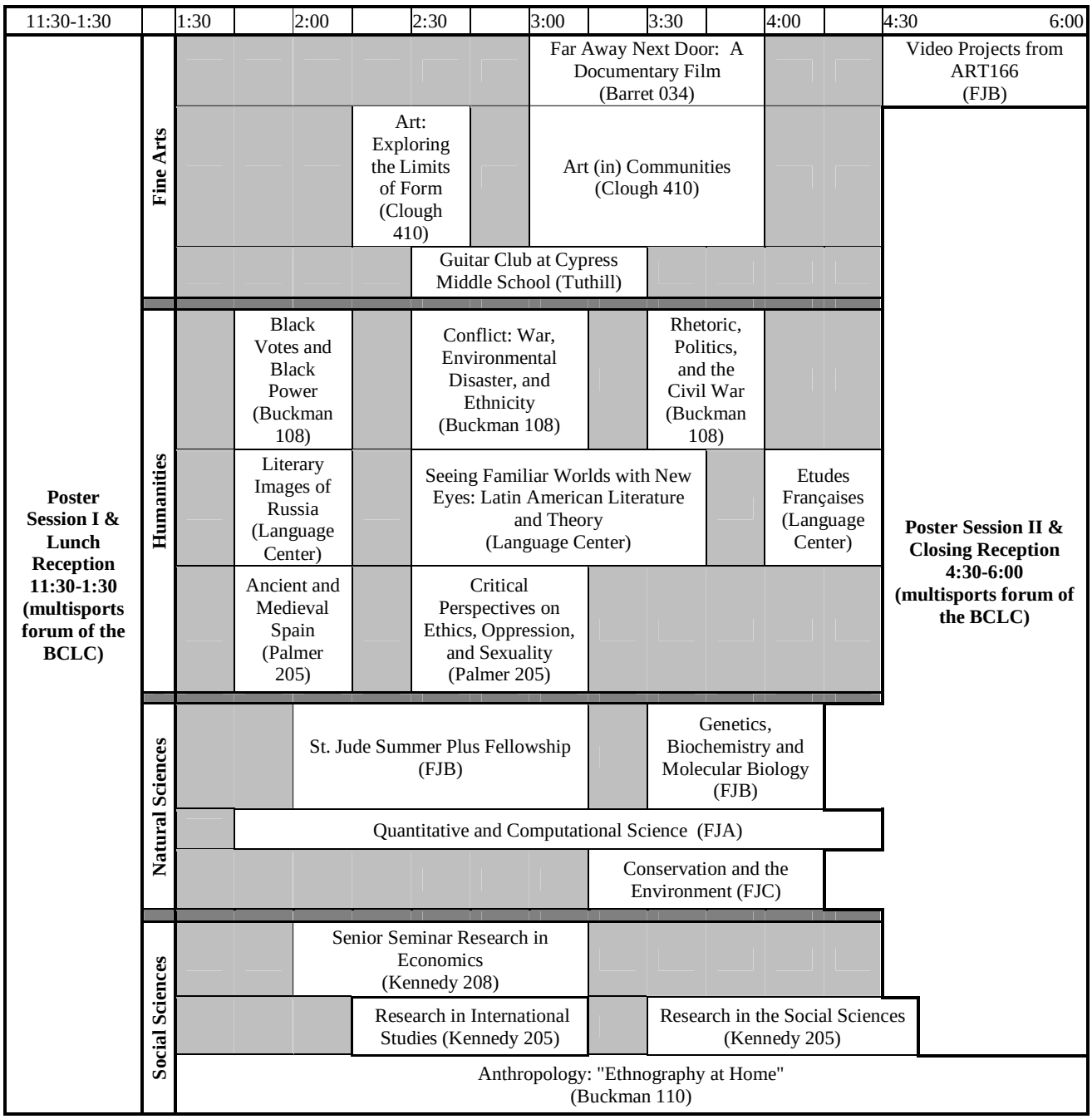


Table of Contents

FINE ARTS ORAL SESSIONS

Art: Exploring the Limits of Form

Clough 410
Session Chair: Nellie Moualeu

2:15 ***Leonardo's Quest: Conquering Nature, Changing Art***
Amy Aughinbaugh
Faculty Sponsor: Victor Coonin, Department of Art
Leonardo da Vinci labored throughout his lifetime to recreate his observations of the natural world. His struggle met the ultimate obstacle when Leonardo had to confront the limitations of visual representation—to recognize that man cannot perfectly reproduce nature. Leonardo's attempts at defying such a proscription led to his identifiably peculiar style. The progress of his inquiry concerning natural representation runs parallel to his artistic development and his subsequent style. Leonardo's final recognition of the limitations of visual representation eventually encouraged him to harness the impossibility of artistic reproduction and use it to elevate his art with unusual optical effects. This argument centers upon four paintings representing distinct periods of Leonardo's artistic development: The Annunciation, The Virgin of the Rocks, La Gioconda, and John the Baptist. Each painting is analyzed in comparison to a series of stylistically related sketches. Leonardo's drawings are a window to his painting because drawings and sketches provide a more intimate perspective of Leonardo's artistic process. In terms of process, the purview of this essay on Leonardo's study of nature is restricted to questions of naturalistic setting (i.e. landscape) and micro scale naturalism such as plant, water, hair studies, and the like.

2:30 ***Out of the Dark Room, into the Salon: Modernist Tendencies between Manet and Bouguereau***
Emily Wehby
Faculty Sponsor: Elliott King, Department of Art
Scholars have widely denigrated William Bouguereau and the art he produced as emblematic of the decline of nineteenth-century academic art-shallow, stagnant, and sentimentalized. By contrast, Edouard Manet is recognized as the turning-point in the rise of modernity that defined itself against conventions of the Academy. I will argue, however, that these two artists had many shared artistic qualities, specifically in terms of color palette, certain choices in subject matter, and a mutual fascination with the medium of photography. These elements lead to strikingly similar formal qualities in their paintings and reposition Bouguereau as an artist who was admittedly conservative but nonetheless mirroring key modernist trends.

Art (in) Communities

Clough 410
Session Chair: Robin Richardson

3:00 ***The Social and Economic Impact of the Stax Legacy on the Soulsville Community***
Joshua Cape
Faculty Sponsor: John Bass, Department of Music
The story behind Memphis' role in the proliferation of soul music relies heavily on Stax Records, a soul music powerhouse during the 1960s and 1970s. On a national level, Stax defined Memphis soul music as the "Memphis Sound" and is remembered as a symbol of racial integration. Existing research focuses on Stax in these regards. On a local level, Stax maintained an intimate relationship with the surrounding community (known as Soulsville), a community which was largely responsible for the success of Stax. Current revitalization efforts in the Soulsville community and rooted in the history of Stax attest to the importance of this relationship. My paper aims to analyze the local social and economic impact of Stax Records and current Stax-related revitalization efforts, which I collectively refer to as the Stax legacy. My work is primarily qualitative, employing a range of human and textual sources, particularly first-hand accounts from Stax personnel, community members, and contextualizing historical works. Ultimately, past and present are synthesized to better understand what Stax meant and still means to the Soulsville community—especially to its youth.

3:20 ***Love à la mode on the London Stage: A Look into the 1812-1813 London Theatrical Season***
Haley Johnson, Caitlin Miller, Caitlin Smith
Faculty Sponsor: Vanessa Rogers, Department of Music
What was London's theatrical world like in 1812? Who were the stars? Which theatrical pieces were driving competition among the rival theatres and attracting the biggest audiences? The London Stage Fellowship (as part of the international

London Stage 1800-1900 database project) has focused this past year on collecting and examining theatrical data from London newspapers in order to seek to understand how theatres functioned as creative and economic institutions within a rapidly expanding and industrializing urban environment. In our presentation, we will provide a snapshot of the widely varying (and often perplexing) musical and theatrical pieces and personalities of the 1812-1813 London season. Among them are operas, burlettas, melodramas, gothic romances, pantomimes, ballets, equestrian and water works, and the lengthy Lenten oratorios; rounding out the season are patriotic works about the wars with Spain and the conflict with France and the United States in the War of 1812. Finally, we will go deeper into two successful nights at the theatre in order to introduce the antics of "The Amateur of Fashion" and the appeal of Europe's most important Italian opera stars. All of the information we uncovered this year gives scholars a start at having a more complete picture of the nineteenth-century theatre in London.

3:40 ***Rhodes Murals Memphis: The Mural Painting 366 Fellowship***
Sarah Knowles
Faculty Sponsor: Erin Harmon, Department of Art
This semester, I have been working as a Fellow for the unique Mural Painting 366 course, taught by Erin Harmon, which has never before been offered at Rhodes. The course offers students the opportunity to gain exposure to not only the artistic side, but also the aspect that deals with the intensive planning, organizing and community involvement that goes in to the execution of a public mural. Throughout the semester, the students, working collaboratively all together as well as in smaller groups, painted a two-tone mural on the West Village construction wall, developed a design for the Memphis Farmer's Market location downtown, and executed a mural for Cypress Middle School after working closely with the students on the design, to name a few achievements. Along with community coordinating and assisting in these projects, my chief duty in my Fellowship was developing publicity strategies, as to get the word out about the course. This primarily included creating and maintaining a Facebook Page, which allowed me to connect with other people and organizations in the community, and a blog, which served the purpose of documenting the progress of the murals, with the goal of interacting and engaging our projects with the Rhodes and the entire Memphis community.

Fine Arts Special Sessions

Guitar Club at Cypress Middle School
2:30-3:30, Tuthill Performance Hall
Daniel Gilham, Will Lang, Stephanie Milazzo, Ben Walsh
Faculty Sponsor: John Bass, Department of Music
A group at Rhodes, working in conjunction with Dr. John Bass, Director of the Mike Curb Institute, has been teaching students at Cypress Middle School basic fundamentals of music theory and guitar performance. With their great improvement over the course of their tutelage, our students have been increasingly involved in performances around the community, notably the Cypress talent show in September of 2011, the Cypress Holiday Show in December of 2011, and the ArtsMemphis Pop-Up Art Festival on March 14th, 2012. Our club has had featured articles in both the Commercial Appeal and on MSNBC's website. This increase in publicity has resulted in better funding for our program, allowing our students to take their guitars home to practice between Guitar Club meetings. This access to guitars has provided our young musicians with the tools they need to further their artistic expression. Guitar Club, one of Rhodes' services to Cypress, a learning corridor school, exemplifies Rhode College's effort to support and enrich its surrounding community.

Far Away Next Door: A Documentary Film
3:00-4:00, Barret 034
Isaiah Swanson, Shyretha Johnson, Rhodes College; David Becker, Colorado College
Faculty Sponsor: Liz Daggett, Department of Art
Far Away Next Door is a 50-minute documentary film about a group of children and teenagers, ages 6-16, from the Hollywood Community in North Memphis who spend six weeks creating, writing, and rehearsing their own original play. Throughout the process, the group discovers ways to allow their own lives, triumphs, and struggles to inform the story they want to tell. The film spotlights four of the oldest in the group: Quay, Von, Jazzy, and Tay. While Jazzy and Tay use singing and writing to overcome obstacles and come to terms with personal loss, Quay and Von seek to empower their community and their lives through rap and dance. With rivalries, street violence, family drama, and only six weeks before performing in front of a live audience for the first time, will the show go on when the curtain rises? A cross between Hoop Dreams and Young at Heart, this film spotlights the wonderful talents of these emerging artists who live "in a place far away, next door."

Video Projects from ART166
4:30-6:00, Frazier Jelke B Lecture Hall
David Bergen, Samuel Bridger, John Cerrito, Brendan Goyette, Christi Haynes, Becca Martin, Lee McAlister, Natalie Ciocca, Bert Geyer, Claire Godfrey, Sydney Howard, Jamie Mann
Session Chair: Liz Daggett

HUMANITIES ORAL SESSIONS

Black Votes and Black Power
Buckman 108
Session Chair: Jasmin Mayen

1:45 ***Black Power: Origins and Meanings***
Colin Antaya
Faculty Sponsor: Tait Keller, Department of History
I discuss the political and social roots of Black Power and argue that it was a movement for self-determination, independent organizing, and economic power. I also assess the validity of Black Power's violent reputation.

2:00 ***Black Voting Rights on Trial: Ex parte Yarbrough and Enforcing the Fifteenth Amendment***
Ian Engdahl
Faculty Sponsor: Tim Huebner, Department of History
The 1884 Supreme Court case Ex parte Yarbrough marked a sharp departure from the Court's post-Reconstruction jurisprudence. In a pair of 1876 cases, the Court held that the Fifteenth Amendment did not empower Congress to make laws protecting black voters from intimidation and violence. In 1884, however, a unanimous Court reversed course and upheld the conviction of a band of KKK members which had terrorized black voters in Georgia. This paper analyzes the political and historical circumstances which caused the Court to take a new tack on black voting rights, and sheds new light on an overlooked yet important chapter in constitutional history.

Conflict: War, Environmental Disaster, and Ethnicity
Buckman 108
Session Chair: Timothy Goss

2:30 ***Designing American Ascendancy: Operation TORCH, 1942***
Jane Barrilleaux
Faculty Sponsor: Tait Keller, Department of History
The North African invasion of World War II, Operation TORCH, was a military operation with primarily political objections, and the political agenda of President Franklin D. Roosevelt overshadowed any sense of military purpose. Rather, Roosevelt used TORCH as an assured, victorious entry into World War II. Operation TORCH marks the beginning of American predominance in World War II and Anglo-American relations that would last the rest of the century, and even into present day. TORCH is much more important than just the invasion of North Africa, in ways that go beyond World War II itself. This operation changed the political landscape of the war and the world because TORCH was the vehicle with which the United States asserted itself over Britain by using France to place itself in the top position of global politics.

2:45 ***The Fog of 1952: A London Particular Turned Disaster***
Courtney Hagewood
Faculty Sponsor: Tait Keller, Department of History
This is an explorative analysis of the 1952 Fog, a tragic four-day fog that enveloped post-war London and spearheaded the movement to regulate city's dramatic urban air pollution. London has been known for its fogs for centuries--think of Dickens and Jack the Ripper. What happened, however, when the fog was more a killer than a charming mist? In 1952, such a killer

fog settled into London in early December and killed an estimated 12,000 people directly or indirectly. The investigations that followed claimed it was a "flu epidemic" to cover up the city's dramatic air pollution problem. This paper explores the development of the fog, the political reaction to it, the cover-up, and finally, the modern research that has redefined the event as an environmental disaster. The London fog of 1952 served as an impetus for the governmental regulation of the air pollution, resulting in the Clean Air Act of 1956, and implicated the importance of public health, degradation of the environment, and government power over both. It provided one of the first legal frameworks for the mitigation of the air pollution and it was a pivotal event in the development of the environmental movement.

3:00 ***Living in Paradise: North African Integration and Assimilation in the French Film, La Haine***
Elizabeth Steen
Faculty Sponsor: Tait Keller, Department of History
The profound difficulties in assimilation encountered by North African immigrants in the Parisian suburbs stem from political and economic marginalization. In the fictional French film, La Haine, Hate (1996), racial and cultural discrimination suffered by disenfranchised immigrants challenges the French concept of egalitarianism. Since the French Revolution, liberté, egalité, and fraternité has been the philosophical basis of French society, but a lack of social mobility relegates newcomers to the lowest social classes. This inability to advance and to be recognized as contributing French citizens has been the cause of an ongoing debate over what constitutes French identity. This film seeks to clarify the historical causes of North African immigrants' exclusion, in particular the development of Paris' banlieue neighborhoods, low-income residential areas outside the city. Furthermore, it reflects a changing France: a France, which President Jacques Chirac in 1997 called "pluricultural." Despite this reality, North Africans continue to be treated as a non-French other because of perceived religious, racial and cultural particularities, which preclude them from social integration and economic mobility. This failure to recognize North African immigrants and their children as citizens of the Republic will only pose further political and social issues for France, as it has the past sixty years.

Rhetoric, Politics, and the Civil War

Buckman 108
Session Chair: Nguyen Huong Pham

3:30 ***The Shifting Civil War Rhetoric of Andrew Johnson and Parson Brownlow, Fierce Tennessee Political Rivals who Set Aside Discord for Union***
William McGriff
Faculty Sponsor: Tim Huebner, Department of History
Andrew Johnson and Parson Brownlow were ante-bellum and post-bellum political rivals in East Tennessee. The rivalry, though, was largely abandoned during the Civil War as both adopted Unionist positions. From the rhetoric that each used leading up to and during the War, it is apparent that even as the two withheld animosities their Unionist arguments were hardly uniform. At the outset, Brownlow denounced secessionists as being without cause—but made it clear that he could be convinced to join the disunion side if the federal government interfered with slavery. By the middle of the war, though, Brownlow was exiled to the North and called for "unconditional unionism." Johnson agreed that there was no legitimate reason for secession, but his initial rhetoric was more concerned with the illegality of secession than with slavery. Later as wartime governor, Johnson opposed emancipation in Tennessee before he unitarily freed Tennessee slaves and declared himself their "Moses." The shifting rhetoric of Johnson and Brownlow makes it clear that each played to their perceived audience at that particular juncture and that both were politically ambitious, even at the cost of ideological consistency.

3:45 ***Tracing Jefferson Davis' Change in Rhetoric during the Civil War***
Logan Henrikson
Faculty Sponsor: Tim Huebner, Department of History
Historians have said much about Jefferson Davis' role in the downfall of the Confederacy but little has been written about what the only president of the Confederate States of America said in his speeches and addresses. My research sought to trace Davis' change in rhetoric through the course of the Civil War. I began with his inaugural address to the new nation and the Confederate people and end with his final address to the Confederate States of America as his country was crumbling around him in 1865. My research shows how Davis was influenced both by the events on the battlefield and in the political arena as he crafted his speeches. This paper follows Davis from the beginning when he was hopeful about the future of the Confederacy and had great confidence in the cause to the end when he frantically called for guerilla warfare in the hopes of

salvaging the nation. This unique scholarship in the field of Civil War history sheds light on Davis' thought processes and rhetorical devices in his Civil War addresses.

Literary Images of Russia: Indomitable Cities and Villages

Language Center
Session Chair: Valeria Nollan

1:45 ***Literary St. Petersburg: Place as Character***
Elizabeth Tomlinson
Faculty Sponsor: Valeria Nollan, Department of Modern Languages
Often called the "Window to the West," the city of St. Petersburg beautifully combines elements of Western European and traditional Russian cultures to create a unique place that almost seems transplanted into Russia. Its rich cultural, artistic, and literary history permeates every aspect of life and transcends time. Walking down the famed Nevsky Prospekt or standing on a bridge overlooking the River Neva, one can feel the same depths of the Russian soul and experience the same moods of the city, as described by notable St. Petersburg authors F.M. Dostoevsky, A.S. Pushkin, N.V. Gogol, and A.A. Blok. These writers not only wrote about St. Petersburg, they allowed the city come to life on paper. This project focuses on how St. Petersburg functions not only as the setting in these authors' works but also as a main character. Furthermore, this project analyzes how the city is personified and characterized throughout the works of the abovementioned authors, as well as how the city has changed the Russian literary canon and vice versa through close examinations of the texts and other critical materials.

2:00 ***Translating Soloukhin's "Little Knife with a Bone Handle": An Experiment in Soviet Translation Theory***
Jake Groves
Faculty Sponsor: Valeria Nollan, Department of Modern Languages
My project examines Russian theories of translation and presents a case study in the prose of Soviet author Vladimir Alexeyevich Soloukhin. In carrying out this task, I examine the major theories of Soviet/Russian translation: "artistic translation" (khudozhestvennii perevod) and "realistic translation" (realisticheskii perevod). "Artistic translation" posits that translations must stay true to both the text and context of a given work, yet it also values the creative role of the translator in re-crafting a work in his/her own language. "Realistic translation" is almost identical to "artistic translation," as it underscores a loyalty to the text/context of a work but restricts the creative input of the translator. After this examination of translation theory, I set forth my methodology and embark on translating Soloukhin's "Little Knife with a Bone Handle" (Nozhichek s kostyanoi ruchkoi). First, I examine the "Village Prose" (derevenskaia proza) movement, the Soviet literary school into which critics place Soloukhin. This provides a context for the author and his works, which deal with themes of rural areas being encroached on by urban expansion and Soviet collectivization projects. From here, I move into an analysis of the story and present my translation of "Little Knife." I conclude with closing thoughts on my experience with translation theory, Village Prose and Soloukhin.

Seeing Familiar Worlds with New Eyes: Latin American Literature and Theory

Language Center
Session Chair: Elizabeth Pettinaroli

2:30 ***An Analysis of the Function of the Journey in the Latin American Story from a Post-Modern Perspective***
Emily Hays
Faculty Sponsor: Elizabeth Pettinaroli, Department of Modern Languages
The journey, or trip, presents itself in a recurring manner in Latin American literature. This essay studies this particularity in four Latin-American stories: "El guardagujas," "El sur," "La isla a mediodía" and "La novela del tranvía" by Arreola, Borges, Cortázar and Gutiérrez Nájera respectively. In these works the journey repeats itself in a series of travels in trains, a plane, and in the case of the last story, a streetcar. In turn, the plot presents the temporal splitting in parallel time dimensions: the normal time and the time of the journey. Upon boarding one of these travel vehicles, the time of the journey makes it so that real time is suspended, an act that opens opportunities to explore the other realities of the characters' fantasies. Using a post-modernist analysis, this essay will try to show how this phenomenon is an allegory about the human construction of what we consider reality, time, and history.

2:45 ***Hazing and the development of masculinity in the city and the dogs***
Brittany Looney
Faculty Sponsor: Elizabeth Pettinaroli, Department of Modern Languages
Hazing has become growing problem among youth, especially in respect to sports teams, fraternities, military academies, elite groups of friends, and gangs. Hazing is responsible for the distraught emotions, arrests, corruption, and also the deaths of many youth who have participated, especially young men—who have survived rigorous and dangerous sessions of hazing with the goal of being a part of an elite group. Acceptance into a group that requires hazing as a form of initiation is a great benefit and has an active role in the construction of the masculinity of a young man. Mario Vargas Llosa's La ciudad y los perros explores the problem with hazing youth; this essay explores the different models of hazing in Vargas Llosa's novel and the different ideologies that the author appeals and undermines. The study of this phenomenon opens the window to discover how this Latin American author explores the construction of an aspect that is key to the elaboration of the identity of masculinity in Latin American context. The essay will also dreflect the implications these literary reflections have on the nature of the same phenomenon from the critical perspective of masculinity theories.

3:00 ***Internal Violence: A Psychoanalytic and Feminist Interpretation of Three Short Stories by Luisa Valenzuela***
Sara Sanders
Faculty Sponsor: Elizabeth Pettinaroli, Department of Modern Languages
Violence presents itself as a frequent preoccupation in Latin American literary works by women. The origin and nature of human violence is analyzed in many texts through a variety of diverse perspectives, which correspond to the particular tendencies of each author. Luisa Valenzuela develops the violence in her work, specifically in her short story collection Simetrías (1993), by means of a psychoanalytic technique and in which the echoes of feminist theory can be noted, especially with her literary development of the body.With a focus on "El cuchillo y la madre", "El zurcidor invisible" y "Viaje", I will investigate how specific instances of violence develop as a result of an internal preoccupation felt by the main character, which emerges when she senses a personal lack of control. The main character in each of these three stories must do something to separate herself, physically or emotionally, from that which is placing her in a position of subordination without control, ultimately preventing her from having any authority, personal or otherwise. To produce a well-supported study of this topic, I will examine the function of the argentine short story, the specific psychoanalytic and feminist elements of each story, and other key tendencies in Valenzuela's writing, primarily her presentation of space and time. These specific points of focus will guide the individual analysis of each text to be followed by an intertextual analysis between the three.

3:15 ***A poststructuralist analysis of the symbolic infusion of jazz in Hopscotch by Julio Cortázar***
Olivia Wells
Faculty Sponsor: Elizabeth Pettinaroli, Department of Modern Languages
Hopscotch, a novel written by Julio Cortázar in 1963, marks the beginning of a process of cultural modernization in the sixties that resulted in formal literary experimentation, a rupture with the linear order of the novel, and the incorporation of specific theoretical value such as psychoanalysis, sociology, and political ideology in the novel. Hopscotch confronts the conventions of literature via its method of perception and representation making it a fundamental novel of the literary Boom movement in Latin America. In this essay I investigate the method by which Cortázar diverges from the structural parameters established by the nineteenth century novel through a textual analysis of the presence and influence of jazz in Hopscotch. More specifically, I propose a methodological focus on poststructuralist theory that establishes pertinent connections between the work and its respective socio-cultural context. The objective of this essay is to explore the following questions: How does the global reception of Hopscotch reflect the ideology of the literary movement at the time of publication? What is Cortázar insinuating with his intertextual incorporation of jazz music in Hopscotch? With the exploration of the enigmatic symbolism of jazz in Hopscotch, I propose an explanation of the literary innovations that Cortázar implements in this novel that provoked such a universal socio-cultural response at the time of publication

3:30 ***Naming the Plot***
Katherine West
Faculty Sponsor: Elizabeth Pettinaroli, Department of Modern Languages
"What's in a name?" For centuries literary critics have analyzed, attempted to answer, and applied Juliet's question to other works. Although not always in agreement about how to arrive at an answer, all agree that names are an important aspect of literary symbolism. This essay studies the importance and significance of the names used by the Buendía family in Gabriel García Márquez's Cien años de soledad. The names of the Buendía family repeat throughout several generations, which, at first glance, seems insignificant. However, the Buendía names take on a new meaning upon deeper analysis. The names are interesting because the characters with similar names share very similar fates. For this reason, it is important to understand the etymology of names and what implications they have in the lives of the characters who carry them. This study will be

devoted to tracing the patterns by which these symbols foreshadow the lives of the characters, uniting and unleashing their destinies. Through this, García Márquez invites reflection on the creation of the fantastic, the literary, and the historical.

Etudes Françaises / French Studies

Language Center
Session Chair: Katheryn Wright

4:00 ***Le Rôle de l'art dans Un amour de Swann***
Virginia Rhomberg
Faculty Sponsor: Katheryn Wright, Department of Modern Languages
L'art joue un rôle important dans Un Amour de Swann de Marcel Proust. Charles Swann, le personnage principal, est dans un état désœuvré où il consacre toute son existence à la vie mondaine. Toutefois, il a une grande appréciation pour l'art, et il l'utilise pour compléter le manque dans sa vie. Dans ce travail, l'importance de l'art va être analysé à travers les deux amours de Swann : le premier pour une petite phrase musicale et le deuxième pour une femme, Odette de Crécy. En examinant la nature de l'art, les signes de l'art, et comment Swann le perçoit et l'utilise, on voit qu'il existe une tension entre ces deux amours. Swann trouve dans cette phrase le bonheur éternel qui ne peut pas décevoir, contraste marqué avec son amour pour Odette qui est constamment la source de sa déception et de son souci. Tout cela va prouver que l'expérience de l'art est supérieure à l'expérience de la vie pour Swann.

The Role of Art in Swann in Love
Art plays an extremely important role in Swann in Love written by Marcel Proust. Charles Swann, the main character, is in a state of idleness where he devotes his whole existence to his high society life. However, he has a large appreciation for art, and he uses it to fill the void in his life. In this work, the importance of art will be analyzed through Swann's two loves: the first for a little musical phrase, and the second for a woman, Odette de Crécy. By examining the nature of art, the signs of art, and how Swann perceives and uses it, one can clearly see that there is a tension that exists between these two loves. Swann finds eternal happiness that does not disappoint in the phrase while Odette is constantly the cause of his disappointment and worry. This work will illustrate that the experience of art is superior to the experience of life for Swann.

4:15 ***L'Emigré et les masques dans Le Ventre de l'Atlantique de Fatou Diome***
Sarah Thompson
Faculty Sponsor: Katheryn Wright, Department of Modern Languages
Cette présentation est une étude des problèmes des émigrés sénégalais dans le roman de Fatou Diome, Le Ventre de l'Atlantique. Apres avoir émigré en France, des Sénégalais n'appartiennent ni à la culture française, ni à la culture sénégalaise, donc les émigrés qui sont revenus au Sénégal sont membres du « troisième espace », une idée qui vient des théories de Homi Bhabha. A cause de la séparation de leur culture maternelle, les anciens émigrés du roman ont besoin de porter des masques. Le masque d'un émigré a pour but de le protéger, de le cacher, et d'éviter des quiproquos. Avec un masque, l'ancien émigré se comporte toujours artificiellement ou inhabituellement pour plaire aux autres. Bien que les masques soient de la même forme, la façon de les mettre varie avec l'émigré.

This presentation examines Senegalese emigration to France, in the novel The Belly of the Atlantic by Fatou Diome. The emigrant characters discover that after emigrating they are no longer a part of either French or Senegalese cultures. Former emigrants, those who have returned from France, thus become members of the "third space", an idea presented by Homi Bhabha in his cultural theories. These emigrants become separated from their maternal culture; as a result the characters in the novel cope by wearing masks. Their masks are used for protection, for them to hide behind, and to avoid cultural misunderstandings. In wearing a mask, the emigrant carries himself in an artificial and atypical manner in order to please the members of Senegalese culture who have not emigrated. Although these masks are of the same form for everyone, each character uses different means to adopt them.

Ancient and Medieval Spain

Palmer 205
Session Chair: Camilla Morrison

1:45 ***Fourth Century Villas in Rural Spain: A Spatial Approach***
Rebecca Vandewalle
Faculty Sponsor: Ariel Lopez, Department of Greek & Roman Studies
Historically, Spanish Late Antiquity has been interpreted as a period of increasing decline, shaped by class struggle and barbarian invasion. Taking into account modern survey work and excavations, only recently has scholarship overturned this long-standing view, indeed proving quite the opposite. Rural villa construction and modification during the fourth century A.D. proves to be a widespread phenomenon unrivaled in Spain before or after. A country villa had two parts, the elite residence and the agricultural center. Thus, its purpose was twofold; not only was it a vehicle to display social status, motivating competition with neighboring elites, but also a working farm, producing agricultural goods as well as supporting other related industries. However, the factors driving the spatial distribution of the villas are still unclear; I will explore the relationship between fourth century rural Spanish villas and the physical and constructed landscape. Within primary sources, panegyric descriptions, tangential references, and agricultural guides build up a picture of important spatial considerations. I will map known villa locations alongside other important natural and man-made features of Late Antique Spain, investigating how the data relate to secondary theoretical hypotheses on villa location, and searching for spatial trends between the datasets, to gain a better understanding of villas in their historic and geographic context.

2:00 ***The Dynamics of Opportunism and Religion in the World of El Cid***
Andrew Bell
Faculty Sponsor: Tait Keller, Department of History
The eleventh century in Spain is an important transitional period in the history and historiography of the Christian Reconquest of Muslim Spain. This paper examines three different Christian accounts from the late eleventh and twelfth centuries and endeavors to demonstrate that there was a relative lack of religious polarization until the recapture of Toledo in 1085 and the subsequent arrival of fundamentalist Almoravids from North Africa. Analysis and discussion of these contemporary sources suggests that the world of El Cid (d. 1099) can best be characterized by opportunism and ambition rather than strict religious divisions.

Critical Perspectives on Ethics, Oppression, and Sexuality

Palmer 205
Session Chair: Jerica Sandifer

2:30 ***The Dwelling of Dasein: Fundamental Ontology as Original Ethics***
Benjamin Curtis
Faculty Sponsor: Kyle Grady, Department of Philosophy
While Heidegger's work is sometimes portrayed as amoral or even immoral, it in fact has deep underlying ethical currents. Following Jean-Luc Nancy's articulation of Heidegger's fundamental ontology as a kind of 'originary ethics' this paper argues that the ontology in Being and Time can also be seen as an original ethics. This concept is most explicitly laid out in the essay "Building Dwelling Thinking." Heidegger uses the term 'dwelling' as a kind of ethical attitude that while cannot provide universal moral principles, does imply that fundamental ontology is a thoroughly ethical project. Ethics, properly thought, is not appealing to such principles, but in fact the constant cultivation of oneself and one's interactions with one's world and others in it.

2:45 ***Unfracturing the Subject: The Necessity of Narrative in Public Discourse***
Timothy Garton
Faculty Sponsor: Leigh Johnson, Department of Philosophy
When Audre Lorde emphatically declared, "The Master's tools will never dismantle the Master's house," she landed a heavy blow against her white feminist contemporaries and changed the trajectory of the Women's movement. Her work suggests that the political birth of an oppressed person is predicated upon the recognition of their subjectivity by another. The failure of white feminists to include more diversity of experience denies the subjectivity of women at the "crucibles" of intersectionality. An exclusion of these marginalized perspectives from politics, public discourse, art, film ect., denies the subjectivity of difference, and, therefore, denies the humanness in the "other." This tendency reduces Black women to Black

and Woman, Poor Hispanic to Poor and Hispanic, and African Hermaphrodite to African and Hermaphrodite. Poetry and prose illuminate this multiplicity in the subject. Thus, the narrative, the story, the poem, stands in for Sarte's "Look." The person who gazes upon the printed page or hears poetry recited is unable to deny the person being told, and is unable to deny the intersectionality being displayed. Rather than an object, or a statistic, the oppressed becomes human, a subject. Therefore, the process of creation is both reformative for the creator and the observer. The reciprocal nature of narrative becomes politically empowering. Thus, problems of the oppressed to be ignored become stories of people to be told and heard.

3:00 ***The Hidden Premises of Sexuality***
Andrea Tedesco
Faculty Sponsor: Leigh Johnson, Department of Philosophy
This paper attempts to provide a critical analysis of Catharine MacKinnon's essay 'Sexuality'. The paper goes through each logical premise in the article's argument and shows the internal flaws in each. MacKinnon makes many claims that do not seem to be logically sound, and the essay explores these claims and attempts to show the flaws that could easily be missed without a close read of her arguments. The main critique of MacKinnon's analysis of sexuality is her heteronormative views with an anti-sex conclusion possibly harming the lives of women. This essay is an attempt to come to a more liberated sex-positive view of women's sexuality in the world.

NATURAL SCIENCES ORAL SESSIONS

Quantitative and Computational Science

Frazier Jelke A
Session Chair: Ryan Carroll and Anne Wilson

1:45 ***Self Dual Matroids From Graphs: Research and Results***
Sarah Thompson
Faculty Sponsor: Eric Gottlieb, Department of Mathematics & Computer Science
In this presentation, we will begin by exploring properties and characteristics of matroids, whose foundation stem from the search for an axiomatic definition of independence by Hassler Whitney in 1935. After this general study of matroids, in which we give background information needed from graph theory and linear algebra, we transition into the specific class of matroids that is self dual. A theorem was proposed by Prof. Gary Gordon of Lafayette College; it states that beginning with any graph, a related vertex to vertex adjacency matrix can be constructed and augmented by the identity matrix, and then the matroid of that augmented matrix is self dual. After presenting this theorem, we will derive and prove it using knowledge of matrices and matroids. Finally we transition to looking at specific matroids of this type, those that come from graphs of 3 vertices. This part of our study demonstrates how the matroid is related to the graph, and is helpful in finding patterns between isomorphic matroids, and their related graphs.

2:00 ***Modeling the Hypothalamic Pituitary Adrenal Axis with Dexamethasone***
Carolyn Drobak, Erin Bodine, Rhodes College; J. Carl Panetta, St. Jude Children's Research Hospital
Faculty Sponsor: Erin Bodine, Department of Mathematics & Computer Science
The hypothalamic pituitary adrenal axis (HPA) system regulates stress in the brain. When this system experiences a dysfunction, such as during chemotherapy treatments, there can be a number of unwanted side-effects such as depression or chronic fatigue syndrome. Dexamethasone (Dex) is a pharmaceutical drug used to lessen side-effects of some cancer treatments and to prevent some HPA dysfunctions. Additionally, Dex is cytotoxic (i.e. it interferes with the operation and production of cells) and can be used for other purposes, but I focus on the use of Dex for treatment of cancers. In this paper, I utilize systems of nonlinear ordinary differential equations to adapt pre-existing models for the HPA system to account for the administration of Dex. The aim of the research presented here is to model the dynamics of the HPA system when Dex is introduced in an effort to further the understanding of the clinical use of Dex in cancer treatments. Latin hypercube sampling, a form of uncertainty analysis, is used to model the variability in the model parameters. Sensitivity analysis will be used to determine how sensitive the model is to small parameter changes.

2:15 ***Survey of the Stratification of the Inertia Space of the SO(2n)-action on R^(2n)***
John Wells
Faculty Sponsor: Chris Seaton, Department of Mathematics & Computer Science
In this presentation, we will discuss the structure of the inertia space of the SO(2n)-action on R^(2n). To define the inertia space we consider the space V^(2n), which is defined to be V={(x,h) R^(2n)xSO(2n)|hx=x}, where the group SO(2n) acts on this space by g(x,h)=(gx,ghg^(-1)). Then the inertia space is defined to be the quotient space of V by SO(2n), denoted SO(2n)\V. A stratification is a decomposition of of a space where each stratum is a set germ of its point. In order to understand the structure of the stratification of the inertia space we will look at the isotropy types, slices, fixed point sets, and equivalence classes of elements in V^(2n). Then we will use the equation developed by Farsi-Pflaum-Seaton which will give us the stratification. For better understanding, we will use examples from SO(3) acting on R^3 and SO(4) acting on R^4.

2:30 ***Portable Navigation System Versus Paper Map Navigation Over Short Distances.***
David Yarbrough, Anthony Fizer, Nicolas Lagueruela, Kevin Stechler
Faculty Sponsor: Betsy Sanders, Department of Mathematics & Computer Science
In this talk we discuss a navigation system for Android phones. For navigating to any specific goal, paper maps have a lot of extraneous information (e.g. all paths to all places) while failing to provide some necessary information (e.g. user's current position). We developed an application for an Android phone or tablet that indicates a path from the user's current position to a target location using a combination of the device's built in GPS, magnetic field sensors, and geographical data coded into the app. We tested the effectiveness of our method by running an experiment to compare our method to map-based navigation. Specifically, we asked subjects to navigate to several locations within the Memphis Zoo using our app or a paper map, and recorded their transit times.

2:45 ***The Movement of a Skyscraper and the Analysis of the Mathematics Behind It***
Chris Rose
Faculty Sponsor: Michael Sheard, Department of Mathematics & Computer Science
Mathematics is very important in understanding how buildings are built to counter forces such as wind and gravity. I will discuss a model for how to analyze the way these structures sway with the wind. While doing this, I will discuss the different parameters and the relationship that these parameters have with the forces exerted on the structures. I will then analyze the floor-to-floor impact that external forces have on these structures. Combining the understanding of how these structures sway with external forces and the floor-to-floor impact that external forces have on these structures will give more appreciation as to how these enormous structures remain standing.

3:00 ***Axiomatizing Paraconsistent Logic***
Kaetlin Taylor
Faculty Sponsor: Michael Sheard, Department of Mathematics & Computer Science
Paraconsistent logic expands upon classical logic by no longer requiring propositions to be absolutely true or absolutely false. Thus, instead of the ordinary two-valued logic, i.e. propositions are either "true" or "false", paraconsistent logic allows a proposition to be both true and false simultaneously. We begin by presenting the motivation for studying paraconsistent logic and describe different approaches that are used to analyze such a logic. We explain how paraconsistent logic can be validly axiomatized and discuss previous axiomatizations of the logic. Furthermore, we provide our improved axiomatization, and prove that it is both complete and consistent. Finally, we describe the significance of paraconsistent logic and how it can serve as a useful extension of classical logic.

3:15 ***Modeling Electrostatic Orbits***
Stefan McCarty
Faculty Sponsor: Shubho Banerjee, Department of Physics
In 2006 and 2008, students from Rhodes College successfully created electrostatic orbits aboard NASA's Weightless Wonder aircraft. To create a theoretical model of electrostatic orbits, however, is difficult since the force between two electrically charged spheres does not exactly follow Coulomb's Law. When the two charged spheres are far apart from each other, the electrostatic force between them can be accurately described using Coulomb's Law. When the spheres are very close to each other, however, the actual force becomes much larger than what Coulomb's Law predicts. The goal of our project was to create an approximate force formula based on experimental data that could be used to accurately model the trajectories of electrostatic orbits.

3:30 ***Radiation Induced Structural Change in Ultra High Molecular Weight Polyethylene***
Rui Li
Faculty Sponsor: Ann Viano, Department of Physics
Ultra High Molecular Weight Polyethylene (UHMWPE) is one component of the roughly 750,000 hip and knee replacements implanted annually in the United States. This material, which serves as cartilage in the artificial joint, exhibits in vivo wear properties known to be affected by a required manufacturing sterilization step, irradiation. Manufacturers exploit the effects of irradiation to improve wear by varying the dose. In this research, transmission electron microscopy (TEM) was used to investigate changes in UHMWPE microstructure with varying radiation dose. Results show that the degree of cross-linking is not monotonic with radiation dose. Structural feature associated with cross-linking are at first enhanced with increasing radiation dose but then subside at higher doses. We theorize that radiation changes dominant bonds, allowing for the formation of new molecular structures which affect the degree of cross-linking. This study may provide an explanation of wear mechanisms and suggest optimal parameters for UHMWPE manufacture.

3:45 ***Ligand Binding and Charge Migration in AChBP's Aromatic Box***
Erin Carter
Faculty Sponsor: Mauricio Cafiero, Department of Chemistry
The active site of the Acetylcholine Binding Protein, called the aromatic-box for its five aromatic amino acid components, is a receptor for nicotine in the brain. To better understand how charge interactions are involved in nicotine binding, we calculated atomic charges for several component structures of the active site using both correlated WFT and select DFT methods and variety of basis-sets. We then docked additional known ligands—morphine, cocaine, and galantamine—and calculated interaction energies (using the 6-311++g** basis set) to further map ligand binding behavior of the aromatic-box. Using information from the above ligand studies, we have designed drug candidate molecules and are currently evaluating their interactions with the aromatic-box in silico. Our results show that bicyclic molecules with heteroatoms bind more effectively in the aromatic box. The addition of hydroxyl groups around the bicylcic portion of the drug candidates seems to improve interactions with the aromatic-box. Preliminary QSAR calculations are being used to draw correlation with known pharmacological properties.

4:00 ***A model for methylation of cytosine: a potential marker for cancer***
Zoe Clark
Faculty Sponsor: Mauricio Cafiero, Department of Chemistry
The nucleic-acid bases in DNA rely on hydrogen-bonding to maintain the structure that defines their function. When a hydrogen atom of a nucleic-acid base is substituted by a methyl-group the resulting change in sterics disrupts intrahelical and interstrand bonding, thus altering DNA structure and function. Substitutions on cytosine, as in the case of 5-methylcytosine and hydroxymethylcytosine, are the only known modified nucleic-acid bases that exist in eukaryotes, and both interfere with transcription of DNA. We model methylation on benzene and cytosine with and without an aromatic molecule in a sandwiched conformation using HCTH/6-31+g*. This additional stacked molecule models both intercalation and the natural DNA environment. The methylation reaction is studied via Friedel-Crafts alkylation and via the reaction in the methyltransferase enzyme. Structures and energies are calculated for reactants, transition-states, and products. Results show that the presence of the stacked aromatic ring increases the energy of reaction and lowers the activation energy.

4:15 ***MP2 and DFT calculations of the interaction energies between boronated aromatic molecules and small DNA models: applications to cancer therapy***
Kelly Allison
Faculty Sponsor: Mauricio Cafiero, Department of Chemistry
Boronated molecules are increasingly used in pharmacological applications including cancer therapy. In boron-neutron capture therapy, boronated molecules localized in tumor cells are bombarded with slow neutrons in order to induce cell death. This work examines possible localization of boronated molecules in DNA by examining differences in interaction energies between boronated and non-boronated ligands with nucleic acid models. We have created complexes of boronated and non-boronated aromatic ligands with different nucleic acid sequences and optimized their structures. Counterpoise-corrected interaction energies have been calculated using MP2, CCSD and various DFT functionals and the 6-31+G* and 6-311+G* basis sets. Results show consistent differences in binding between boronated molecules and non-boronated molecules to nucleic acids within single-stranded DNA complexes. Current work includes ONIOM(MP2:AM1) interaction energy calculations for boronated and non-boronated ligands within double-stranded DNA complexes. Double-stranded complexes were also modeled with and without charges on the phosphate groups and with and without solvent present.

St. Jude Summer Plus Fellowship

Frazier Jelke B
Session Chair: Maha Bano

2:00 ***Strategies Towards the Total Synthesis of Erythrina Alkaloids***
Nicholas Jensen, Rhodes College; Taotao Ling, Gabriela Salinas, Fatima Rivas, Department of Chemical Biology and Therapeutics, St. Jude Children's Research Hospital
Faculty Sponsor: Mauricio Cafiero, Department of Chemistry
Erythrina alkaloids are novel alkaloids isolated from tropical terrestrial flowering plants of the Fabaceae family. Used in folk medicine for centuries, Erythrina alkaloids exhibit antibiotic, anti-malarial, and sedative properties in addition to anticancer effects. These alkaloids offer a broad range of compounds with potential to become therapeutic agents for the treatment of pediatric diseases, particularly central nervous system malignancies. The important biological properties of these alkaloids fueled our continuous effort to find new drug leads, and we have developed an efficient synthetic route to the erythrina core using a novel nucleophilic allylation reaction. Compounds were purified and characterized utilizing column chromatography, UPLC-MS, and NMR techniques.

2:15 ***Broken Windows of Healthcare: The importance of cultural factors in reducing medication errors***
Mae Gillespie, Rhodes College; James Hoffman, Department of Pharmaceutical Sciences, St Jude Children's Research Hospital
Faculty Sponsor: David Kabelik, Department of Biology
An estimated 98,000 patients die each year from errors that occur during their medical care. The patient safety research unit of the Pharmaceutical Sciences Department at St. Jude Children's Research Hospital works to develop methods for reducing these harmful medication related errors. An important aspect of their research involves measuring and modifying the patient safety culture present in the hospital environment. Safety culture is effectively a measure of staff attitudes and beliefs with regards to safety practice and procedure. Elements of a positive safety culture promote communication as well as learning from incidents that occur. In order to facilitate a positive safety culture within a hospital environment, it is important to achieve a balance between the punitive and non-punitive approaches that have been used in the past. This middle approach is known as Just Culture and is the new direction for patient safety culture. Methods for measuring Just Culture and interventions to modify safety culture ensure that hospitals are creating the optimal environment for reducing the number of medication related errors. The purpose of this research paper was to educate members of the healthcare community and indicate gaps in the research literature where new studies or improvements could be performed.

2:30 ***An Approach to Continuous Improvement of Clinical Decision Support for Medications***
Niti Yogesh, Rhodes College; James Hoffman, Donald Baker, Jennifer Robertson, and Cyrine Haidar, Department of Pharmaceutical Sciences, St Jude Children's Research Hospital
Faculty Sponsor: Loretta Jackson-Hayes, Department of Chemistry
Clinical decision support (CDS), particularly computerized alerts, is cited as a compelling benefit of computerized provider order entry (CPOE). However, if too many alerts are presented, "alert fatigue" may result in clinicians disregarding alerts. In 2006, a clinician group at St. Jude sought to minimize nuisance alerts while maintaining clinically important alerts. Drug interaction alerts were set to display only at the highest severity level, and duplicate therapy alerts were disabled. To facilitate assessment and careful consideration, override reasons from clinicians were required. Each interaction, allergy, duplicate therapy, and rule event that fired, regardless of whether it was displayed, was analyzed. The study was successful in limiting the number of alerts presented to clinicians so that only the most important alerts were presented. Reasons for alert override were useful to evaluate and improve alerts. It was determined that such evaluation of the alerts should be continued to maximize the safety benefits of alerts and other CDS. A follow-up study was completed in 2009 and the refinement of alerts was again successful. Here we report progress from another follow-up study.

2:45 ***Radiation therapy dose has minimal effect on subsequent physis closure in pediatric patients treated for sarcomas adjacent to long bones***
Kira Reich, Rhodes College; Chia-ho Hua, Matthew J. Krasin, Department of Radiological Sciences, St. Jude Children's Research Hospital
Faculty Sponsor: Darlene Loprete, Department of Chemistry
We hypothesized higher doses of radiation (RT), used to treat pediatric sarcomas, would cause premature growth plate (physis) closure. We analyzed 34 patients on an IRB approved study of RT effects and evaluated physis closure in long bones adjacent the RT site. The mean physis radiation dose was calculated from the RT plan. Physis status was determined

by serial MR. Mean dose, age at treatment, and progression through puberty were assessed for their effect on physis closure. Median age at RT was 13.3 yrs. 67 physes were assessed for their initial status; 47 were open at RT onset. Median dose to all physes was 3564 cGy. Median dose to those that closed/remained open was 3679 cGy/3260 cGy, respectively. Median age at closure was 15.4 years (range 13.9-20.4). Neither increasing physis dose ($p=0.3$), nor gender ($p=0.36$) predicted risk of closure. Older age at RT was predictive of physis closure ($p<0.001$), likely related to normal pubertal completion. Passing through the pubertal phase (defined as age >15 years) significantly affected likelihood of physis closure ($p=0.025$). Physis closure did not correlate with the RT dose to the physis. Alterations in bone growth may be related to other factors and will be investigated.

3:00 ***Interaction of Gli3 and SPOP in Hedgehog Pathway***
Zheng Wang, Rhodes College; Tanja Mittag, Department of Structural Biology, St. Jude Children's Research Hospital
Faculty Sponsor: Dhammika Muesse, Department of Chemistry
Hedgehog pathway plays a key role in controlling cell fate during embryogenesis. Overactivation of the Hedgehog pathway can lead to cancers such as medulloblastoma and basal cell carcinoma. It is identified that Hedgehog signaling can be tuned by E3 ubiquitin ligase through the degradation of Cubitus interruptus (Ci) in Drosophila. SPOP is a mammalian homolog of Hh induced MATH and BTB protein (HIB), which is a part of the E3 ubiquitin ligase. In mammals, the Hedgehog pathway mediates the degradation of Gli via protein SPOP. In Drosophila, Ci uses multiple Serine/Threonine (S/T)-rich motifs that bind HIB cooperatively to mediate its degradation. It is estimated that Gli3 only needs two out of its thirteen binding motifs to bind SPOP because SPOP is known to be a dimer. To investigate how multiple binding sites affect the interaction between Gli3 and SPOP, we made several constructs encompassing various regions of Gli3 with different numbers of binding motifs to test their binding to SPOP. We are mutating the binding sites on these constructs and examining the effect of different numbers of binding motifs on the interaction between Gli3 constructs and SPOP using nuclear magnetic resonance (NMR) spectroscopy and isothermal calorimetry (ITC).

Conservation and the Environment

Frazier Jelke C
Session Chair: Jasmin Mayen

3:15 ***An Integrative Assessment of Snake Parasitism in an Urban Old-Growth Forest***
Adiha Khan, J.M. Grisham , A.L. Johnson, M.S. McCravy, A.J. Yu , K.R. Jones J.R. Davis , S.A. Boyle L.E. Luque de Johnson
Faculty Sponsor: Laura Luque de Johnson, Department of Biology
Parasites are ecologically significant and influence community structure through a variety of interactions. Notably, the ecological interactions of parasites in snakes are largely unknown. Field ecology, microscopy, molecular techniques, and geographic information science (GIS) were integrated to characterize parasitism of snakes in an urban old-growth forest park. The species, sex, mass, length, location, and prevalence of ecto-, hemo-, and fecal parasites were determined for 34 snakes of 6 species. One ectoparasite (mite), one hemoparasite (Hepatozoon spp.), and four fecal parasites (Entamoeba spp., Trichomonas spp., Strongloides spp., and an unidentified helminth) were detected in snakes and 64.7% of snakes were infected by at least one of these parasites. Parasite infections were generally not related to the sex, age, or body condition of snakes. The locations of infected snakes were used to produce risk maps indicating where parasite prevalence is predicted to be greatest. These maps indicated that snakes with fecal parasites were closer than non-infected snakes to the forest edge. This study confirms that snakes may be important parasite hosts or reservoirs in parasite transmission pathways in urban environments, and it provides an integrative multidisciplinary approach that may be used to monitor parasitism dynamics in other urban wildlife areas.

3:30 ***Activity budgets of two captive red pandas at the Memphis Zoo***
Sarah Ferguson, Sarah Boyle, Rhodes College; Andrew Kouba, The Memphis Zoo
Faculty Sponsor: Sarah Boyle, Department of Biology
The red panda (Ailurus fulgens) is an herbivorous, primarily nocturnal and solitary animal native to the Himalayas. Little is known of red panda behavior, so we collected 132 hours of data (May 2011- March 2012) in order to determine an activity budget for two individuals. Data were collected using scan sampling at 2-minute intervals on one male and one female red panda housed together. The female red panda spent more time sleeping than the male red panda (90.26% and 78.57%, respectively). The male red panda spent more time moving and slightly more time grooming than the female red panda (male:

11.64% moving, 8.18% grooming; female: 2.86% moving, 5.65% grooming). Similar percentages were found for both sexes' eating behaviors. Future research can compare these activity budgets to wild red panda activity budgets to gain a better understanding of red panda behavior.

3:45 ***Python Batch-Processing to Quickly Create KML Code for GoogleEarth Exhibition: A Case Study with VECA***
Rebecca Vandewalle
Faculty Sponsor: Sarah Boyle, Department of Biology
With the goal of making spatial data accessible to those without a background in Geographic Information Systems (GIS) software, this presentation follows the development of a Python script tailored to batch-process user-designated databases to meet project-specific requirements. This script is designed to compile KML, code used by Google Earth to display and annotate spatial data. In mere minutes this process is able to return what would take months to code by hand, making feasible the display of a project that encompasses thousands of records and various additional associated files. Though other solutions to batch-process spatial data into KML exist, scripts written to adapt to various design parameters from the offset will save much time otherwise spent reprocessing already processed data to fit the unique needs of a specific project. This script was developed to be transparent, accessible, and user-friendly, so that it may be updated and reused to take in account tweaks to the design, additional data, or new versions and features of KML code. Applied to various interdisciplinary projects, this script is an invaluable tool streamlining the transformation of raw data into an accessible product. This presentation will highlight its application in the Vollintine-Evergreen Community Association (VECA) Mapping Initiative.

4:00 ***A GIS Approach to Sustainable Development at the Memphis Zoo***
Adam Alsamadisi, Sarah Boyle, Rhodes College; Andrew Kouba, The Memphis Zoo
Faculty Sponsor: Sarah Boyle, Department of Biology
The Memphis Zoo, in partnership with Rhodes College, is interested in environmentally sustainable models of development and management. We hypothesized that by integrating spatial analysis into zoo operations, sustainable planning initiatives could be met related to: the cost-benefit analysis of zoo special events, benefits of installing renewable energy sources, management policies that continue to encourage a green culture by the institution, and incentives in developing more energy-effecient zoo infrastructure. Through the process of gathering field data, analyzing utility expenses, and mapping zoo infrastructure, we developed a geographic information system aimed at "greening" the zoo. We'll present our findings from this project and discuss broader applications to improving sustainability, reducing our carbon footprint, and show how this technology is easily transferable to other Zoos and Aquariums throughout the country.

Genetics, Biochemistry and Molecular Biology

Frazier Jelke B
Session Chair: Carolyn Drobak

3:30 ***Ruthenium-based chemotherapeutic KP1019 induces DNA damage response in Saccharomyces cerevisiae.***
Lindsey Bierle, Rebecca L. Miller, Mary E. Miller, Rhodes College; Pamela K. Hanson, Department of Biology, Birmingham-Southern College
Faculty Sponsor: Mary Miller, Department of Biology
The ruthenium complex, trans-[tetrachlorobis (1H-indazole) ruthenate (III)] (KP1019), has shown to be a promising alternative to traditional platinum based cancer therapies. Animal models suggest that KP1019 causes DNA damage, but the mechanism by which the drug acts is poorly understood. Microarray analysis was carried out to determine if the transcription profile of S. cerevisiae responded to KP1019 exposure. From this analysis, we saw drug dependent induction of several genes involved in DNA damage response. HUG1, a gene with unknown molecular function that is induced in response to DNA damage, had the highest level of induction in the presence of KP1019. We hypothesize that HUG1 is induced in response to DNA damage caused by KP1019. Several other genes that are co-regulated by the transcription factor DUN1 were also induced. Microarray analysis indicates that the DUN1 transcription factor itself was induced following KP1019 exposure. Western blot analysis verifies a KP1019 dependent increase in Hug1 protein levels, though the induction is not as high as that of standard HU treatment. Based on these data, we speculate that KP1019 causes DNA damage that result in the activation of the DUN1 dependent response and increased level of Hug1 protein.

3:45 ***Mapping the Arabidopsis Genes Responsible for Variation in Parental Genomic Imprinting***
Damiana Altamirano
Faculty Sponsor: Jonathan Fitz Gerald, Department of Biology
Parental genomic imprinting limits expression of an imprinted gene to the allele contributed by one parent. One explanation for this phenomenon is the parental conflict hypothesis whereby parental gametes silence the genes least favorable for optimal resource allocation. This may suggest that natural populations exhibit variation in how they regulate imprinting. An imprinted gene in Arabidopsis, AtFH5, is paternally silenced and exhibits maternal expression limited to the posterior pole of the seed endosperm. The upstream promoter region of AtFH5, CUT4, is sufficient to provide this imprinted and spatial expression pattern to a RFP reporter. Introduction of CUT4 into Columbia and Landsberg erecta lines of Arabidopsis allows us to assay if different genetic backgrounds can alter imprinted gene expression. Crossing Col CUT4:RFP lines to Ler, we found that CUT4 mothers resulted in F1 plants with no RFP expression. Conversely, genetically identical plants from CUT4 fathers displayed biallelic RFP expression throughout the endosperm. F2 progeny varied in their ability to express the RFP marker. Genetic polymorphisms allow us to map the loci responsible for parental regulation differences.

4:00 ***Genotype-Independent Maternal Regulation Acts in Response to Paternally-Directed Increase of Seed Size in Natural Variants of Arabidopsis***
Sara Taylor, Xiao Wang
Faculty Sponsor: Jonathan Fitz Gerald, Department of Biology
Parental genomic imprinting is a mechanism of gene regulation whereby parental gametes silence specific genes. The Parental Conflict Hypothesis describes this phenomenon as an epigenetic antagonism between maternal and paternal selective pressures. In plants, this conflict is predicted to result in a paternal imprinted program that acts to increase seed size and a maternal program that limits seed size. Using the plant Arabidopsis thaliana, we have established that "competition crosses," with two fathers pollinating a single flower, directly tests the conflict model. Arabidopsis plants isolated from Landsberg, Germany (Ler) have smaller seeds compared to plants isolated from Cape Verde Islands (Cvi). Ler fathers, however, promote a dramatic increase in seed size on Cvi mothers suggesting either a strong imprinted program by the Ler father, or a weak imprinted program by the Cvi mother based on the conflict model. Competition crosses, rather than producing two distinct populations of small (Cvi father) and large (Ler father) seeds, resulted in homogenous seed size from these two fathers. This suggests that the "paternal effect" in seed size is possibly a maternal response to foreign pollen that is independent of offspring genotype or paternal inputs.

SOCIAL SCIENCES ORAL SESSIONS

Anthropology: "Ethnography at Home"

Buckman 110
Session Chair: Susan Kus

1:30 ***Alchemy Turns a Restaurant into Gold; An Ethnographic Study of the Rhythm of a Restaurant.***
Leslie Craddock
Faculty Sponsor: Susan Kus, Department of Anthropology & Sociology
Why do some restaurants succeed but the majority fail? What goes on behind the scene of a successful restaurant? These are some of the questions I had asked myself before beginning my ethnographic research at Alchemy Restaurant. The ethnographic method allows us to appreciate the temporal rhythms, material surrounding, to social relations. The purpose of my ethnography was to uncover the ways in which the employees of a restaurant navigate the material, cultural, and social scene of working in a restaurant. Only those in the restaurant industry know the inside of a restaurant. I began my ethnographic research when I became employed as a hostess at Alchemy Restaurant. Alchemy is the new hot spot bar and restaurant born in the Copper Young district of Memphis, Tennessee. Alchemy is unique in that despite the economy it has been busy nearly every day since its opening. I would like to share with you what I have learned through participant observation about the rhythm and rhyme of a successful restaurant.

1:45 ***A Rare Glimmer of Hope: The Ethnographic Study of a Local Food Market in an Urban Food Desert***
Anna Rose Fitzgerald
Faculty Sponsor: Susan Kus, Department of Anthropology & Sociology
Ethnography is a method of research most often used in anthropological and sociological disciplines, with a goal of learning about and gaining an understanding of the many different cultures and sub-cultures existing in our human world. Through participant observation I have attempted to understand and gain a better appreciation for the cultural scene at a local food market in a neighborhood of urban Memphis. This semester I have served as a volunteer at Urban Farms Market, but beyond this I have attempted to be a sensitive observer of the cultural scene at the market. Interacting with volunteers, customers, and workers, I have explored why they choose to support this local initiative and how they manage to do so. I have also explored the community aspects of the market. It is my hope that this presentation will provide you with the means to gain an understanding of and appreciation for Urban Farms Market, people's involvement there, and the communities it has both come from and created.

2:00 ***Exploring Otherlands: An Ethnographic Study of a Local Favorite***
Jeremy Herman
Faculty Sponsor: Susan Kus, Department of Anthropology & Sociology
Anthropologists aim to cultivate an appreciation for human customs and practices that ultimately compels us to reflect on our own cultural logic, worldviews, beliefs and values. To accomplish this, anthropologists employ the ethnographic method of participant observation. This research method requires one to engage in observation and discussion with "insiders" to ultimately learn more about a particular cultural scene. There are strong implications for cultural diversity arising from this experience. In our increasingly complicated society, already unfamiliar cultures are only becoming more unfamiliar. The application of this ethnographic method is vitally important for understanding and appreciating alternative lifestyles. I have been practicing participant observation at Otherlands Coffee Bar, located in the Cooper-Young District of Memphis. My time spent here as an ethnographic researcher has shown me that Otherlands has more to offer than just coffee. I hope to share my experiences and the stories I have been told. The eclectic atmosphere, socially inviting environment, and friendly interactions are what attract people to visit and return. The ambiance that is both vivacious and serene, and the diverse range of its clientele affirms and confirms Otherlands Coffee Bar's claim on its website, to be an "Oasis in the Heart of Midtown".

2:15 ***Mixing Business and Art: An Ethnography of Counterculture Artists***
Marie Hoag
Faculty Sponsor: Susan Kus, Department of Anthropology & Sociology
Ethnography serves a key purpose in the field of anthropology, allowing researchers to immerse themselves within a cultural setting as participant observers in an attempt to understand "the other". The purpose of my ethnography is to understand the ways in which a relatively new, local tattoo parlor operates. In my ethnography, I analyze how time is managed at the parlor, the artists' interpersonal relationships with each other and their interactions with customers. Over the past several weeks, I have been able to engage the artists and customers of Inked Tattoos using informal interviews and general observation. I have come to witness that specific artists take a more active, dominant role at the parlor, while certain others use the parlor for appointments only. I have also come to witness various attitudes surrounding the significance and meaningfulness of tattoos. The artists at Inked have created intensely personal pieces of art involving significant consultation and studio time, as well as spontaneous, on-the-spot artworks for walk-in customers. Overall, my ethnography has introduced me to a completely new environment and has helped me dispel preconceived notions that are often attached to tattoo artists and their clientele.

2:30 ***Sweating My Assumptions Off: A Study of Bikram Yoga Memphis***
Margaux Hoglind
Faculty Sponsor: Susan Kus, Department of Anthropology & Sociology
Anthropologists use ethnographic study as a means to come to understand the "other." This understanding is achieved through participant observation, where the researcher becomes a part of a cultural scene in order to witness first-hand the aspects of that culture. For my ethnography, I chose to study at Bikram Yoga Memphis, a fitness center that literally features many "hot bods." The yogis of Bikram Yoga Memphis are a courageous community who battle 100^0+ temperatures together to master a specific set of 26 yoga postures. The result of practicing Bikram yoga is an invigorating experience and amazing workout that pulls on inner strength and stretches beyond the body, for "pulling is the object of stretching." I have found that the yogis of Bikram Yoga Memphis are much more than a group of people simply working out together; they form a community featuring encouragement, camaraderie, and plenty of "smiling happy faces." My presentation will introduce you to and, hopefully, help you appreciate on this stretching, sweating, and smiling community.

2:45 ***Underground, Uncensored, and Unique: An Ethnographic Study of Memphis Tattoo Culture***
Rachel Kauffman
Faculty Sponsor: Susan Kus, Department of Anthropology & Sociology
Ethnography is an anthropological method that allows a person to observe the "other." While anthropologists are associated with studying the "exotic other," the "other" can also refer to people within our own society with different beliefs and values than our own. Participant observation is anthropology's original and enduring contribution to social science methodology, and through this method I was allowed to become an active participant in the social scene that is Underground Art. Underground Art is anything but conventional though. It is an accredited tattoo parlor in the Cooper-Young District that has been thriving for almost twenty years. Tattoos are normally associated with a rough appearance and attitude; television shows have portrayed tattoo parlors as sites for angsty artists. I have discovered this is an exaggerated stereotype. During my time at Underground Art I have observed the clientele, the employees, and the interactions between these groups and have come to appreciate that, despite the seeming laid-back attitude of the shop, it is a qualified business taken seriously by the artists working there. At Underground Art I have discovered the tight-knit bond that the employees share and extend to the clientele and their profession that is also a way of life.

3:00 ***Nursing My Curiosity: An Ethnographic Look into Life at a Nursing Home***
Elizabeth LeCorgne
Faculty Sponsor: Susan Kus, Department of Anthropology & Sociology
With little previous knowledge of the ethnographic method before initiating this project, I have now come to appreciate how important this methodology is to collecting information necessary to appreciate various cultural scenes. My particular ethnographic study aims to use the central anthropological skills of observation and participation in order to better understand daily life at a nursing home. My initial curiosity was focused on the residents' experiences living in such facilities and how the staff understands meaningfulness in their jobs. I have situated myself within the environment as a volunteer and have collected observations as a researcher throughout the semester. I have come to appreciate how difficult it is to integrate the necessary fast-paced actions of nurses and attendants concerning the well being of the residents with the slower-paced actions and reactions of the residents. Although I experienced my moments of awkwardness, this method has allowed me to truly integrate myself into the community and understand it to the best of my ability. My presentations will share with you the results of my ethnographic research.

3:15 ***Eat More Chicken…Observe More Cultures***
Colin McDonald
Faculty Sponsor: Susan Kus, Department of Anthropology & Sociology
In the technologically driven, hyper-capitalistic society we live in, where efficiency is king and the margin for error is slim, who has time for sit-down meals anymore? Who has time to think about what they are consuming or about the particular fast-food restaurant they just rushed in-and-out of? Many individuals consider fast-food as a given or traditional staple of our diet. This widespread "assumption" has led me to investigate the cultural scene of one chain restaurant, Chick-fil-A. To understand the cultural phenomenon behind this fast-food powerhouse, I used the ethnographic method of participant-observation to study the daily activities of a particular location in Memphis. From my observation of and participation in this cultural scene, along with informal interviews with staff and patrons, I have been able to paint a clearer and more nuanced picture of the true colors of Chick-fil-A. In particular, I will discuss how their seemingly 'ideal' demographic understood through advertising and company policies compares to the reality of their customer base. If you are one of the millions who eats or seen Chick-fil-A advertising on billboards and TV, but never really stopped to think about it, you might be interested in testing your assumptions against my findings

3:30 Break

3:45 ***Live Your Life with No Regrets: An Ethnographic Study of a Memphis Tattoo Parlor***
Mary McDougal
Faculty Sponsor: Susan Kus, Department of Anthropology & Sociology
Ethnography employs the anthropological method of participant observation in its study of other cultures. This method seeks to broaden our understanding of "others", both near and far. This methodology of participating in a cultural scene, all the while observing it respectfully, should be recognized as a critical skill in our current world. The practice of such a skill allows us to enter into important cross-cultural social discourse. To begin to exercise this skill, I chose No Regrets Tattoo Emporium as the site of my ethnographic study. My intention was to use the ethnographic method to examine the prejudgments many people have about those who choose to tattoo their bodies. Through my observations over the course of the semester, I have come to see No Regrets as an environment in which employees are bound together by both a shared

work environment as well as a passion for art. Even more than that, however, it is a cultural location which fosters social interactions between all individuals, including employees and customers. It is a business which revolves around a particular art form and in which each individual is welcome to express him or herself as desired.

4:00 ***Dog Eat Dog World: An Ethnographic Study of the Memphis Animal Shelter***
Regan McLaughlin
Faculty Sponsor: Susan Kus, Department of Anthropology & Sociology
The art of anthropology lies primarily in the execution of ethnography. I utilized the ethnographic method of participant observation by submerging myself in the role of a shelter volunteer and experiencing first hand, the rich culture of the Memphis Animal Shelter. For nine weeks I scooped poop, played with puppies, washed dogs, and added new members to families. Throughout my time at the Memphis Animal Shelter I realized that not only was I creating families, but I had become a part of one too. There is a stigma that goes along with working at a shelter that occasionally has to "put down" animals that, because of mistreatment and abuse by former owners, are unadoptable as pets, but the people within those walls have some of the biggest hearts of anyone I have ever met.

4:15 ***My Black is Beautiful: An Ethnographic Study of BB Beauty Plus***
Johnathan Payne
Faculty Sponsor: Susan Kus, Department of Anthropology & Sociology
Independently run beauty supply stores that cater specifically to the cosmetic needs of the African-American community are a vital resource to the neighborhoods they reside in. These stores sell a wide variety of products, ranging from sew-in hair extensions to natural oils to do-it-yourself perm kits. I became interested in the culture of the beauty store I regularly frequent, BB Beauty Plus on Jackson Ave, and decided it would be an intriguing place to perform an ethnographic study. Ethnography is a qualitative research method that aims to understand a specific culture or population through direct engagement and participation within that culture's environment. Positioning oneself directly into the culture of their research is pivotal in understanding the way that culture exists in the world. Through my observations, I have discovered a distinct way in which customers see the beauty store and how, conversely, the employers see their customers. My presentation will attempt to shed some light on the dynamics of this relationship, as well as share some knowledge and insight of the vast world that is the black haircare industry.

4:30 ***Ethnography at the Pink Palace Museum: Observations of the Observers Observing***
Mairi Stockton
Faculty Sponsor: Susan Kus, Department of Anthropology & Sociology
The ethnographic method involves the use of participant-observation in order to achieve a better understanding and appreciation for a certain culture or setting. Through the use of participant-observation the anthropologist works to truly immerse him or herself in the chosen setting. By doing this, the anthropologist is able to observe through the act of participating in the culture, and as a result can learn more about the people and culture that he or she is studying. I chose to do my ethnographic study at the Pink Palace Museum of Memphis because I feel that it has much to offer in terms of the amount and variety of people it attracts. In my research study at the Pink Palace Museum of Memphis, I am aiming to gain a better understanding of the various ways in which museum guests interact with the many exhibits through the use of the ethnographic method and participant-observation. Through my research at the Pink Palace Museum of Memphis I will focus on which exhibits appear to garner the most interest from the museum visitors and what factors contribute to the visitors' interest.

4:45 ***How Can I Help You: A Look and Smell Into an Independent Midtown Business***
Rachel Strug
Faculty Sponsor: Susan Kus, Department of Anthropology & Sociology
Cultural anthropologists study and gather information about a cultural scene that is considered new or unknown to the researcher through use of the ethnographic method. The ethnographic method involves the act of participant observation to collect data and more importantly, gain insight into the lives of those being observed. Never being behind the counter in a storefront before, I chose to study the cultural scene of Maggie's Pharm, a shop that sells oils, herbs, and other natural products. This particular store requires much more employee – customer interaction due to the customized nature of the herbs and oils for customers based upon their personal requests. Because the small business is such a personal experience, the employees and customers create friendships that go beyond the traditional nameless interactions in large stores. Learning about these relations is a reminder that a shopping experience is about the customer, and Maggie's Pharm never forgets to make the customer feel welcome and caters to all their shopping needs.

5:00 ***Lost and Found in Translation: An Ethnographic Study of Su Casa Family Ministries***
Elizabeth Swann
Faculty Sponsor: Susan Kus, Department of Anthropology & Sociology
Language is the quintessential form of communication between human beings. Through vocabulary, diction, syntax, and tone, meaning is expressed and messages are conveyed. But how do people interact when a common language is not spoken between them? Su Casa Family Ministries provides the perfect setting to explore such a question. Su Casa is a non-profit organization that teaches English as a Second Language (ESL) to help the Hispanic community assimilate into the greater Memphis culture. Volunteers come from diverse backgrounds to hold ESL classes and build relationships with the students and their families. However, not all the volunteers (teachers included) speak Spanish. How are these groups able to communicate with one another? Does the lack of a common language pose more challenges or opportunities? When studying such topics, anthropologists use the art of ethnography and the method of participant observation to integrate themselves into a chosen setting and study the intricacies of that culture. Throughout the semester, I have conducted ethnographic research by volunteering at Su Casa. My time at the non-profit has allowed me to understand and appreciate the many ways that language is both a barrier and a bridge.

5:15 ***3 A.M. Paul Bunyans: A Cultural Investigation of CK's Coffee Shop***
Charles Yarn
Faculty Sponsor: Susan Kus, Department of Anthropology & Sociology
The ethnographic method is intended for people to closely examine the culture of the "Other" in relation to their own. This helps us to interpret and gain an understanding of different social contexts that we are unfamiliar with. The ethnographic method of participant observation involves participating in an unfamiliar social setting, while staying conscious of our own cultural influences. This grants us the opportunity to uncover aspects of both the "Other" and ourselves that we were previously unaware of. My personal ethnography was done at CK's Coffee Shop in Midtown, a twenty-four hour diner that serves breakfast all day long. I intend to examine how the waitresses deal with working long hours at a restaurant that seems to never be completely empty, and their relationships with the customers that frequent it. Hopefully, my role as a participant observer will help me to interpret meaning in everyday occurrences at CK's. I should then be capable of comparing this meaning to my own cultural foregrounding, so that I may gain a greater understanding of this cultural scene.

5:30 ***Just Kickin' It: An Ethnographic Study of a Group Kickboxing Class***
Charlotte Young
Faculty Sponsor: Susan Kus, Department of Anthropology & Sociology
Ethnography is method of research utilized by anthropologists in order to record a "slice of time" in a cultural setting. This type of research would provide members of society with insight to how the various cultures in our world live. In turn, studying another culture may permit the individual to reflect back on his or her life and own assumptions and misassumptions. In my ethnographic study I decided to participate in and observe a group kickboxing class at the French Riviera Spa on Union Avenue. Through the method of participant observation I slowly became immersed in the kickboxing cultural scene. I learned to jab, cross, side kick and the like. Kickboxing, a type of work out that I viewed as aggressive and rough, is actually a form of exercise that involves a deep focus on specific moves and leaving your worries at the door. My ethnographic study allowed me to understand and appreciate the "group mentality" that forms between classmates during such a vigorous work out. I hope that my presentation will allow you to appreciate how a bond is established through the class member's shared struggles, efforts to overcome inhibitions and to ultimately maintain coordinated movements.

5:45 ***Varying Versions of Vinyasa: An Ethnography of Midtown Yoga in Memphis Tennessee***
Jessica Murrer
Faculty Sponsor: Susan Kus, Department of Anthropology & Sociology
The ethnographic method is a powerful tool anthropologists use to immerse themselves in unfamiliar cultural scenes. The benefits of this method are highly significant as it allows individuals to look beyond preconceived notions and develop an enriched detailed understanding about a cultural phenomenon. This is accomplished through the technique of "participant-observation" which positions the ethnographer as both a participant in the cultural scene and as a conscious observer of the scene. This ethnography of Midtown Yoga studio attempts to appreciate the differences of rhythm, material culture, clientele, and sensory aspects of two Vinyasa Yoga classes offered at Midtown Yoga. During this semester I have immersed myself in the field by becoming an avid member of Midtown yoga, attending several weekly classes to gain an appreciation for the practice of yoga. While observing teachers, practitioners, yoga language, and the physical and sensory environment (from temperature to smell), I have recognized interesting variations of energy, mood, and participants' goals between classes taught during the day and taught during the night. This ethnography stretches from sunrise to sunset and will loosen your biases into a relaxing and interesting interpretation of Midtown Yoga.

Senior Seminar Research in Economics

Kennedy 208
Session Chair: Caroline Philhower

2:00 ***The Power of the Little Blue Pill: The Effect of Viagra on Marital Stability***
Cody Beatty
Faculty Sponsor: Sarah Estelle, Department of Economics
Viagra, the first pharmaceutical treatment for erectile dysfunction (ED), was introduced to the American market in March of 1998. Fourteen years later, sociologists Susan Brown and I-Fen Lin have documented that over the past two decades divorce rates among those 50 years of age and older have nearly doubled. From now-pervasive advertisements for ED drugs, it is clear that this pharmaceutical class is targeted toward older (often married) adults, but what is not clear is whether the availability of Viagra has attenuated or exacerbated marital instability among older adults. This paper models the effect of Viagra on marital stability, and provides insight on whether or not the availability of Viagra has actually caused some increase in divorce rates amongst middle and older aged couples. This paper draws from Friedberg and Stern's (2010) utility model which incorporates caring, or the notion that an individual will take into account his/her spouse's satisfaction in the marriage when considering divorce. Using waves 2 and 3 of the National Survey of Families and Households, I can derive proxies for Viagra use through stated health conditions and how couples rate their sex life. The data also encompass other variables that the literature has shown to influence divorce rates. I will incorporate a variety of these as controls including the number of years married, number of children, race, religion, age, and education.

2:15 ***Are Charter Schools the Long-Term Solution? Student Labor Market Outcomes***
Virginia Keel
Faculty Sponsor: Sarah Estelle, Department of Economics
Charter schools, the newest vehicle for education reform, are non-profit elementary and secondary schools run by non-governmental entities. With three to five year state contracts, these schools operate more like private businesses than traditional public schools. Charter schools continue to emerge with resources from the Obama administration, state governments, and philanthropists like Bill and Melinda Gates. Despite their popularity, research finds no apparent academic impact of charter schools, but high test scores are not the only indicator of a high quality education. Imberman (2011) found that charter schools do improve the noncognitive skills of their students, and labor market research shows significant effects of these skills on wages, career choice, and job stability. This research uses the National Education Longitudinal Study of 1988 to propose a study of charter school effects on student labor market outcomes such as wages, employment, and occupation choice. My results will contribute evidence of long-term effects of charter school attendance, in contrast to existing research that focuses on only short-term educational outcomes, and should prove instructive to educators as well as policy makers as the nation pushes for education reform.

2:30 ***Does an additional child affect voter turnout?: Family structure's influence on parents' decisions to vote***
Alex Petraglia
Faculty Sponsor: Sarah Estelle, Department of Economics
Contemporary political campaigns spend millions of dollars through systematic organizing, advertising, and rallying to target certain constituencies. For years these campaigns, aiming to get the greatest bang for their political dollar, have attempted to cater to those who are most likely to participate in the democratic process. Previous studies of the influence of marriage and divorce as factors in the decision to vote have dominated the literature on family structure and voter turnout. Following the canonical model of rational voting developed by Downs (1957), I propose to estimate the effect of an additional child on parental voter turnout. I will apply a limited dependent variable model to control for factors such as one's religion, health, and social networks that may be endogenous to the model of voter turnout. If my results demonstrate that individuals with more children are less (more) likely to vote, then it follows that rational politicians, who cater to the demands of their constituents perhaps with (re-)electability in mind, will be less (more) likely to expend political capital advancing policy that benefits these voters.

2:45 ***Can we reduce healthcare costs without reducing health? The effect of medical practice guidelines on health outcomes***
Margaret Walker
Faculty Sponsor: Sarah Estelle, Department of Economics
U.S. healthcare expenditures are increasing considerably each year, and more importantly, an estimated one-third of annual expenditures, about $700 billion or nearly 5 percent of GDP, have no appreciable impact health outcomes overall.

Proponents of medical practice guidelines argue that guidelines can reduce national health expenditures by decreasing a major determinant of the expenses, malpractice litigation costs. This paper provides insight on the influence of practice guidelines on physician choices and further models the production of patients' health dependent on the medical treatment received as result of physicians' decisions. National Vital Statistics natality data are used to determine whether medical practice guidelines, implemented in Maine and Florida in the 1990's, affected health outcomes. By adapting the linear probability model employed in Currie and Macleod (2008), health outcomes are estimated by measuring recorder complications. Physician behavior is then also modeled with regards to procedure choice. These models then compare results of different periods of time when guideline based reform was implemented to identify whether practice guidelines affected health outcomes within the states. Results will subsequently indicate whether practice guidelines can reduce the country's health care expenditures and how they affect health outcomes.

3:00 ***Do For-Profit Colleges "Profit" Nontraditional Students? The Effect of Attendance on Wages***
Claire Warren
Faculty Sponsor: Sarah Estelle, Department of Economics
As the returns to a college education have risen over the past three decades, more and more students have sought postsecondary degrees, leading to drastic changes in the makeup of the market for higher education. This change is evident both in the increasing presence of for-profit schools and the growing enrollment of nontraditional students. As federal financial aid generosity increased, making college enrollment possible for more students, for-profit colleges met increased demand by nontraditional students by opening new campuses and providing more offerings. Because lower income, nontraditional students make up the majority of for-profit college enrollment, these schools have some of the highest default rates in the country, which raises questions regarding what advantages these schools provide. Despite the importance of this issue, research on for-profit colleges is limited, particularly in regards to labor market outcomes for nontraditional students. As nontraditional enrollment rises and for-profit colleges continue to capture a larger portion of the market, understanding the benefits of for-profit colleges is necessary in order to assess the efficiency of resource allocation within the market. I propose to estimate the impact of for-profit college attendance on wages through the use of the Baccalaureate and Beyond Longitudinal Study. A propensity score matching approach will be implemented in order to control for selection and endogeneity effects.

Research in International Studies

Kennedy 205
Session Chair: Lizzie Williams

2:15 ***The Geography of Confict***
Adam Alsamadisi
Faculty Sponsor: Nuray Ibryamova, Department of International Studies
The influences of socioeconomic geographic phenomena are perhaps best made evident in understanding the frequency of conflict in Sub Saharan Africa; a region where a spirited and historically volatile environment provides human populations with an abundance and mismanagement of natural resources, a colonial past has left ineffective governments of ethnic mosaics interrupted by unreasonable borders, and the prospects of liberal economies have been juxtaposed with unevenly developed infrastructure. Through GIS analysis and discussion and application of International Relations theories, African civil conflict from the past two decades in two regions of Africa, The Great Lakes Region of Central Africa and the Caprivi Strip in Southern Africa, will be geographically and theoretically evaluated. An example of spatial conceptualizations of social science, this presentation will consider African political and economic history and the locations of conflict in Sub Saharan Africa.

2:30 ***Drawing Lines: Institutional Role in the Development of the British Cameroons***
Jonathan Sokoll
Faculty Sponsor: Steve Ceccoli, Department of International Studies
In 1960, Nigeria gained independence from Britain, and French Cameroon gained independence from France. However, the future of British Cameroon, the territory wedged between these new nations remained. In a 1961 UN organized plebiscite, North British Cameroon elected to join Nigeria, and South British Cameroon join French Cameroon. The social and political development of these regions greatly diverged from this point. The use of historical institutionalism identifies different norms of regional autonomy to explain varying levels of development between the two regions. The French colonial legacy of central rule provides an institutional impediment to the incorporation of former British Cameroon into civil society.

2:45 ***Considerations on Chinese Motivations for Aid In Africa***
Chidimma Emelue
Faculty Sponsor: Nuray Ibryamova and Amy Risley, Department of International Studies
China's role as one of the rising BRIC countries had yielded economic successes, consequences of which include the increase of Chinese aid and assistance to the African continent; this increase of aid in Africa has contributed to China's rising prevalence in the media and in various international institutions. Many intellectuals have proposed explanations for rise in overall Chinese foreign aid, specifically aid to Africa, including realist claims of hegemony and liberalist claims of diplomatic motivations. Analysis of the nature of Chinese aid in Africa, various intellectual interpretations of this aid, and a comparative glance at Chinese aid in Africa versus Chinese aid in Southeast Asia will reveal that the most convincing claim is a dual explanation, which seeks to couple postcolonial perspectives with rational choice theoretical approaches. The increase of Chinese aid in Africa is simultaneously a rationally constructed policy prescription for power acquisition and a valid attempt by China to counter Western neocolonial influences on the African continent.

3:00 ***The Relationship Between Pastoralists and the State***
Maxwell Hardy
Faculty Sponsor: Nuray Ibryamova, Department of International Studies
As African states continue to examine their roles in the international community, so too are they looking at how different groups within their borders interact with their government. This project identifies two examples of such a group—nomadic pastoralists—and studies their relationship with the state. Pastoralism is a practice in existence for at least a millennium, yet only recently have pastoralists needed to interact with their government and have policy-makers considered consulting them about national and regional decisions. This research uses interest-group theory, historical institutionalism, and political culture theory to ask what determines the relationship between the Afari people and Ethiopia, and the Maasai people and Kenya.

Research in the Social Sciences

Kennedy 205
Session Chair: Kondwani Joe Banda

3:30 ***Retrieving Proper Names: Are Older Adults Adversely Affected By Competition From Other Names?***
Hannah Emery, Sunandra Mattancheril, Rachel Stowe
Faculty Sponsor: Katherine White, Department of Psychology
A tip-of-the-tongue (TOT) state is a common retrieval failure that occurs when a well-known name is unable to be recalled. Although older adults experience more TOTs than young adults, retrieval of the forgotten "target" name is facilitated following exposure to phonological primes, particularly when the prime and target share first syllable. This experiment investigated a predicted decrease in phonological priming of TOTs when primes and targets share semantic category (i.e., occupation). Young and older adults were prompted to retrieve targets (e.g., Liam Neeson) from a variety of semantic categories (e.g., historical figures, actors). Following TOTs, participants answered a question that included a phonological prime from the same semantic category as the target (Leonardo DiCaprio), a prime from a different semantic category (Leo Tolstoy), or an unrelated name (Robert Langdon). Retrieval of the target name was then reattempted. An increase in target retrieval was expected following phonological primes from different semantic categories (compared to unrelated names), but not following primes from the same semantic category as the target. This semantic competition was expected to be exacerbated for older adults who are particularly vulnerable to the effects of competing words.

3:45 ***The Effect of Nursing Students' Clinical Experiences on Probability of Graduation***
Alex Herran, Dee Birnbaum, Rhodes College; Linda Finch, University of Memphis; Mark John Somers, New Jersey Institute of Technology
Faculty Sponsor: Dee Birnbaum, Department of Commerce & Business
Nursing is an enigmatic case of an essential societal role that has experienced shortages for decades. Researchers who have been studying the most recent nursing shortage in the U.S. have voiced concern that one of the distinctive patterns of the current shortage, unlike those of the past, is this shortage seems to be fueling itself. Some researchers suggest that as students witness the shortage first-hand during their clinical experiences, students will be discouraged from completing their nursing education. During their second semester of nursing school, students were surveyed about their reactions to their clinical

experiences. A survey instrument was developed, tested and validated. Probit analyses indicated there is a significant inverse relationship between positive experiences during clinical practica and the probability of graduating from nursing school.

4:00 ***Multiple Facets of the Nursing Shortage in United States***
Jing Zhou
Faculty Sponsor: Dee Birnbaum, Department of Commerce & Business
This paper will address the issue of nursing shortage in United States. Using survey data from a major urban hospital, this paper will test the conclusions made by Buerhaus concerning the supply of nurses. I will show the barriers to entry for new nurses and the retirement of older nurse are creating a vicious cycle that contributes to a bigger shortage. In addition, I will examine whether this shortage will continue as the demand for nurses grows with the aging of the baby boomer generation.

4:15 ***Economic Liberty in Constitutioinal History***
Ian Engdahl
Faculty Sponsor: Dan Cullen, Department of Political Science
The Supreme Court's consideration of the constitutionality of the individual mandate provision of the Affordable Care Act has renewed public discourse on the nature of economic freedom under the United States Constitution. The paper analyzes the ideas of such early legal thinkers as Locke and Blackstone, and evaluates their influence on the founder's conceptions of economic liberty. The founders had an almost religious respect for private property, and articulated an expansive view of economic liberty which included liberty t contract. This paper evaluates the Supreme Court's notorious Lochner decision in this context, and charts the decline of economic liberty jurisprudence in the twentieth century. The history of economic liberty in the United States sheds light on the legitimacy of the Affordable Care Act.

4:30 ***What effect does an applicant's GPA have on graduation from nursing school?***
Sarah Doherty, Alex Herran
Faculty Sponsor: Dee Birnbaum, Department of Commerce & Business
Nursing college graduation rates have become a serious concern for the healthcare industry as the United States is projected to suffer a serious nursing shortage by 2020. Due to the current shortage in nursing school faculty, admissions are forced to offer limited spots. It is important to the future of the healthcare industry that nursing schools select candidates who are most likely to graduate and enter the nursing profession. Our research focuses on the relationship between nursing students' undergraduate sophomore application GPA and their probability of graduating from nursing school. We anticipate that this research will help to inform nursing schools when selecting candidates for their programs. If GPA is the primary driving force, admissions officers can place less emphasis on other factors in their admissions decisions. We will conduct a hierarchical regression in order to determine the weighted importance of GPA in comparison to other factors such as engagement, gains, and clinical experiences.

POSTER SESSION I
Multisports forum of the Bryan Campus Life Center
11:30am – 1:30pm
Poster Numbers are listed with each title.

Social Sciences

#1 ***Does Student Engagement affect Nursing School Graduation?***
Sarah Doherty
Faculty Sponsor: Dee Birnbaum, Department of Commerce & Business
As the United States is projected to have a nursing shortage, a decline in nursing college graduation rates has become a serious concern for the healthcare industry. In order to help nursing schools devise ways to increase graduation rates, my research focuses on the relationship between nursing student engagement levels and graduation rates. I hypothesize that increased student engagement such as class participation, group work, and faculty interaction positively correlates with nursing school graduation rates. Data collected from a local nursing school has been examined psychometrically and correlated to graduation rates in order to determine the importance of nursing student engagement for graduation.

#2 ***Sociology of Medicine: The Biology, Epidemiology and Treatment of HIV/AIDS***

Rachel Strug, Jack Clark, Kara Holifield, Rachel Kauffman, Omair Khattak, Sonya Kheshti, Mary Catherine Reeves, Charles Walker

Faculty Sponsor: Tom McGowan, Department of Anthropology & Sociology

The sociology of medicine studies how the organization and provision of medical care can be improved by addressing sociocultural factors that undermine effective treatment and care. This poster presents research on the biology and epidemiology of HIV/AIDS and the barriers to care reported by people living with HIV/AIDS (PLWHA). DOT (direct observation of treatment) is discussed as an effective strategy to address the sociocultural factors that might otherwise undermine patient compliance and treatment outcomes. The importance of integrating sociocultural analysis into medical practice is further illustrated by a discussion of the recent changes made to the Medical College Admissions Test (MCAT).

#3 ***Sociology in Medicine: Sociological Factors and Infant Mortality***

Lindsey Bierle, Anna Rose Fitzgerald, C.J. Lewis, Joshua McKinley-Smith, Joseph Miller, Chelsea Prince, Mairi Stockton, Charles Yarn

Faculty Sponsor: Tom McGowan, Department of Anthropology & Sociology

The revision of the Medical College Admissions Test (MCAT) reflects the importance of providing medical students with a more comprehensive, holistic framework that integrates sociological considerations into the practice of medicine and health care. We present here research on some of the social factors that contribute to the public health issue of infant mortality. Infant mortality is typically associated with non-industrialized countries; however, epidemiological data indicate that infant mortality rates in parts of the United States are as high, or higher than, rates in non-industrialized countries. We argue that social factors, including socioeconomic status, age, and access to prenatal care affect infant mortality rates in the U.S. Finally, we propose that changing the way health care providers educate, interact with, and provide care to pregnant women can reduce the risk of infant mortality. This approach is an illustration of sociology in medicine, a medical sociological approach that utilizes research to analyze factors that contribute to disease risk and barriers to effective medical care.

#4 ***Choice Neighborhoods and Public Housing Redevelopment***

Robert Cook

Faculty Sponsor: Heather Jamerson, Department of Anthropology & Sociology

The HOPE VI program was the first national effort to replace severely distressed public housing with mixed income housing communities. The City of Memphis received six HOPE VI grants to redevelop public housing across the city. The HOPE VI program was succeeded in 2010 by the Choice Neighborhoods Program with the aim to promote more comprehensive neighborhood change once the public housing complexes were destroyed. Both Memphis and the city of Jackson, Tennessee received planning grants to develop "Neighborhood Transformation Plans" centered around the redevelopment of Foote Homes and Allenton Heights, respectively. The grant application has three components - Neighborhood, Housing, and People - all of which have to demonstrate significant change from the $25,000,000 implementation grant. The housing portion revolves around the redevelopment of the public housing complex and surrounding neighborhood. In the transformation plan, grant writers must also discuss the public services and infrastructure that will be created or enhanced to assist the people living in the impoverished neighborhood. The final section of the grant application consists of a plan for the so called "ripple effects" and changes that will be brought on by the implementation grant. This presentation will discuss the progress of these Choice Neighborhood redevelopment efforts in West Tennessee.

#5 ***Gauging Experiences of Cleaborn Residents Prior to Relocation***

Elizabeth LeCorgne, Julia Clapper, Andrew Kochanski, Ryan Landry, Jeanine Claiborne

Faculty Sponsor: Heather Jamerson, Department of Anthropology & Sociology

The HOPE VI program has been active in Memphis since 1995 and has redeveloped and revitalized four housing projects: College Park, Uptown, University Place, and Legends Park (formerly known as LeMoyne Gardens, Hurt Village, Lamar Terrace, and Dixie Homes, respectively). The current work that has been put into place at Cleaborn Homes is the fifth project towards the development of Memphis. As researchers in the Field Projects in Community Organization course, we conducted in-depth interviews with former Cleaborn residents to gain an understanding of their experiences in living in Cleaborn Homes. This presentation attempts to depict the expressions of the former Cleaborn residents with the Cleaborn community.

#6 ***HOPE IV: Evaluation of Claiborn Homes Residents Post-Relocation***
Elizabeth LeCorgne, Julia Clapper, Andrew Kochanski, Ryan Landry, Jeanine Claiborne
Faculty Sponsor: Heather Jamerson, Department of Anthropology & Sociology
HOPE VI is a program put into action by the United States Housing and Urban Development Department to demolish "severely distressed" public housing units across the country, and establish new property that combats poverty and socio-economic disparity. One of the goals of the HOPE VI program is to provide opportunities and create incentives to the residents of public housing complexes to the point of self-sufficiency and empowerment. During this semester, the Field Projects in Community Organizations class evaluated the services rendered to the residents engaged with the current HOPE VI project in Memphis with Cleaborn Homes. As evaluators and researchers, we assessed the data management system that displayed the types of services that were provided to the residents. Then we ventured out into the community to hear the opinions of the former Cleaborn residents concerning the range of services offered with their transition out of public housing. This presentation attempts to capture the ways in which the former Cleaborn residents were impacted through the HOPE VI program.

#15 ***Russian Youth Movements: Hope or Hype***
Katherine McCoid, Jennifer Sciubba
Faculty Sponsor: Jennifer Sciubba, Department of International Studies
The palpable energy characteristic of youth movements is one of the factors that makes them so forceful; in union with the resources and capabilities of a government, this force can prove even more powerful. Yet, even when the aims are aligned with the state some groups flourish more than others. What factors determine the difference? This paper, examines the various pro-regime youth movements in the Russian Federation today. Through close examination of the successes and failures of various movements, particularly the Nashi, Oborona (Defense), and Revolutionary Communist Youth League, we find that youth movements that had media access to spread their message, state funding, and less of a chance of jail time proved to be more successful, and these were the movements that tended to align with the parties holding most power. The Russian example may mean that in cases where the state has great influence over the daily activities of its people, the youth movements most closely aligned with ruling political party of the state are more likely to accomplish their goals than other movements because they are awarded more advantages by the state.

#16 ***Memphis City Schools: A Tale of Two Systems***
Louis Jehl
Faculty Sponsor: Marcus Pohlmann, Department of Political Science
Professor Marcus Pohlmann and I have been researching the 2010 graduating class from the Memphis City Schools. Looking specifically at students who scored a college ready benchmark on the ACT (We used both 19 and 21 because different schools have different measures for college readiness), we were able to break down that graduating class into two groups: those who were college ready and those who were not. By examining the race, gender, GPA, mobility, schools, economic disadvantage, disciplinary issues, and other variables for these two different groups, we saw staggering differences. Although the two groups had large differences in terms of most of these variables, we saw a surprisingly small difference in the GPAs of the two groups. This research has the potential to serve a very important role in trying to figure out how we can effectively target the group that is not college ready for improvement while also shedding light on the common factors of those students that have been successful.

#25 ***Differing College Attitudes among AP, Honors, and Non-Honors Students in Memphis City Schools***
Briana Culmo, Elise Suna, Elizabeth Monda
Faculty Sponsor: Janet Panter, Department of Psychology
College readiness has become a growing interest in schools today and the majority of students possess a desire to attend college (Condition of Education, 2004). However, not all students are college bound. This study attempts to account for this gap between aspiration and attainment in Memphis City Schools (MCS). It expands on internal data MCS currently collects and explores whether students in different levels of classes (AP, honors and regular) differ in their attitudes and beliefs toward college. It will show which students believe they will be successful in college, which students believe college is important, and which students feel as though their peers, parents and teachers believe that they can succeed. We believe that students in AP classes will have more positive attitudes about college than students in either honors or regular classes.

#26 ***Comparing the Effectiveness Between School Readiness Constructs***
Rebecca Diamond, Christa Lesko, Anna Reilly
Faculty Sponsor: Janet Panter, Department of Psychology
The High Scope curriculum has been shown to be effective in preparing pre-school children for kindergarten, as demonstrated by studies evaluating children's abilities and readiness using the Bracken School Readiness Assessment (BSRA; Panter & Bracken, 2000). The Bracken has developed strong reliability and validity, thus becoming a widely accepted assessment for school readiness (Panter, 2010). Another reliable assessment instrument, the Early Screening Inventory-Revised (ESI-R; Meisels, Marsden, Wiske, & Henderson, 1997) has also proven effective as a measure of readiness. While both studies serve the same purposes, then, they measure performance in different domains. The purpose of our study was to compare the two instruments and determine which constructs they share and in what ways they measure different domains and readiness skills.

#27 ***The Influence of Self-Reported Grades, Needs Assessment, and Planned Course of Study on Students' Academic Performance***
Margaret Goss, Leisy Ruddock, Anna Blair Solomon
Faculty Sponsor: Janet Panter, Department of Psychology
Factors including students' self-reported grades, needs assessment, and planned course of study have been proven to influence their academic performance. In our study, we explored the accuracy of self-reported grades, the reasons some students plan to attend college yet ultimately do not enroll, and the reasons students are not asking for help when they need it. This was determined by administrating the EXPLORE test to 14,868 eighth grade students from 45 schools in a large urban district. The EXPLORE test is used to assess academic progress and provides an early indicator of college readiness. Our results showed higher self-reported grades and reporting no needs were correlated with higher scale scores. Since this continues to be a serious issue, we believe additional research should focus on these specific areas to help address this problem.

#28 ***"She would act like a queen at ressice and think she would rule the fort": Cultural Voice and Early Identity Development***
Regan Humphrey, Marsha Walton, Rhodes College; Alice Davidson, Department of Psychology, Rollins College; Caitlin Campbell, School of Professional Psychology, Pacific University
Faculty Sponsor: Marsha Walton, Department of Psychology
Despite its potential implications for youths' identity development, the ability to appropriate the culturally-specific language of one's community (or "cultural voice") has been neglected in writing assessment measures. Proficiency in mechanics, on the other hand, is frequently assessed. The present study sought to develop a measure of cultural voice and to investigate its association with narrative skills and academic adjustment. An ethnically diverse sample of third- through fifth-grade students wrote narratives about peer conflict, which were coded for cultural voice, mechanics, psychological mindedness, moral concerns, and metanarrative comments. The students also completed a peer-nomination measure of academic reputation, and their teachers rated each student on academic skills, academic effort, and attention problems. The results showed a strong association between mechanics scores and academic adjustment, but only a weak association between cultural voice and academic adjustment. Cultural voice was significantly correlated with other narrative skills, but the results suggested that cultural voice decreased over the course of the school year. We suggest that educators should recognize cultural voice as a strength that contributes to engaging writing, as well as to the negotiation of identity in early adolescence.

#29 ***The Effect of Increased Awareness of White Privilege on Social Dominance, Color Blind Racism, and Support for Racial Compensation***
Leigh Allison
Faculty Sponsor: Chris Wetzel, Department of Psychology
I investigated whether two videos (Tim Wise's "The Pathology of Privilege" and White Privilege Conference video, "White Privilege 101: Getting in on the Conversation") had any effect on White students' color-blind racism (the belief that discrimination no longer occurs and race should be ignored), social dominance orientation (motivation to dominate others and support social hierarchies), and support for compensatory affirmative action. I randomly assigned participants to either video condition and also manipulated whether participants self-affirm or affirmed a celebrity's values before watching the video, which failed to have any impact. Compared to the White Conference video, the Wise video reduced color-blind racism and increased support for compensatory affirmative action. Furthermore, it marginally decreased the motivation for social dominance. I will discuss why the Wise video had a greater impact and why the affirmation manipulation failed to have an effect.

#30 ***Could A New Awareness of White Privilege lessen racial prejudice, Increase support for affirmative action, but simultaneously increase fears of social isolation from White peers?***

Tyler Catterton
Faculty Sponsor: Chris Wetzel, Department of Psychology

White Privilege is defined as the tangible benefits of access to social rewards and resources and the ability to shape and control the values and norms of society that Whites receive, consciously and unconsciously, due to their skin color. I examined the possible effects of two White Privilege awareness videos on White college students. First, could it decrease racial prejudice towards minorities? Second, could it increase support for welfare for racial minorities? Lastly, could the new awareness of White Privilege cause White students to refrain from talking about privilege in fear of damaging their social standing? When compared to *White Privilege 101*, the Tim Wise video was more effective at decreasing racial prejudice and increasing support for affirmative action. Neither video differed for increasing concern about discussing White privilege and losing social status.

#31 ***"My Privilege, My Identity: The Impact of Two Educational Videos on Racial Identity and Acceptance of Personal Privilege"***

Jasmine Gilstrap
Faculty Sponsor: Chris Wetzel, Department of Psychology

The phrase "White Privilege" refers to the unearned advantages society grants to a white person based solely on the color of their skin. Since the idea of "White Privilege" is unknown to those benefiting from the system, research on the topic has shed light on the impact of "White Privilege." Recent research has tended to focus on the impact of self-identification and association with one's race as indicators for how participants will receive information about reaping the benefits of privilege. In my experiment, I looked at the impact of two videos (Tim Wise's video, "The Pathology of Privilege," and White Privilege Conference video, "White Privilege 101: Getting in the Conversation") on racial identity and whether students' awareness of personal racial and non-racial (gender, heterosexual, and social class) privilege differed between the two videos .The results showed no significant effects of the videos on racial identity or on personal, non-racial privilege, but the Wise video did induce more awareness of personal racial privilege than the Conference video. In looking at race, I discovered that non-White students had a stronger racial identity and a lower sense of personal racial privilege than did the white students.

#32 ***Confronting White Privilege: Comparing the effectiveness of two educational videos on increasing privilege awareness and willingness to confront privilege***

Shyretha Johnson
Faculty Sponsor: Chris Wetzel, Department of Psychology

White Privilege refers to the advantages that a White person accrues from society due to the color of their skin. Unlike racial discrimination, privilege focuses on the structural, cultural, and institutional forms of racism while allotting less focus on individuals. White privilege is largely unacknowledged by those in power, Whites, and is a difficult concept to teach. I examined how the White Privilege Conference video, "White Privilege 101: Getting in on the Conversation", and Tim Wise's video, "The Pathology of Privilege", differ in their effects on White students' awareness of general (non-personal) racial privilege, non-racial (gender, heterosexual, and social class) privilege, and attitudes toward confronting white privilege. Additionally, students self-affirmed or affirmed a celebrity's values before watching the videos. The Wise video created more awareness of racial privilege and willingness to confront White Privilege than the Conference video. The self-affirmation did not influence White students, but when non-Whites students were included, those who self-affirmed had a lower awareness of racial privilege than those who affirmed the values of a celebrity. I will discuss why the Wise video was more effective than the Conference video and why the affirmation effects are depended on race.

#33 ***The Effects of Two Racial Privilege Educational videos on Feelings of Being a Victim of Reverse Discrimination, Feelings of Responsibility for Ending Privilege, and Feelings of Self-efficacy in Reducing Privilege***

Lauren LaBat
Faculty Sponsor: Chris Wetzel, Department of Psychology

"White Privilege" refers to unearned advantages that White people receive because of the color of their skin. Privilege is systematic, institutional, and is largely unacknowledged by the privileged group. One of the consequences of ignorance to privilege is that a White person might feel that they personally suffer from reverse discrimination or that the White race as a whole suffers from affirmative action. I assessed these two beliefs along with feelings of personal responsibility for ending racial privilege as well as feelings of self-efficacy for reducing privilege by examining the impact of two videos, "White Privilege 101: Getting in on the Conversation," and Tim Wise's video, "The Pathology of Privilege." Participants completed a pre-test survey, watched the video, and completed a post-test to assess their awareness of and reactions to White Privilege. Results indicated that the Wise video induced more feelings of personal responsibility for racial privilege, reduced feelings of

personally being a victim of reverse discrimination, and reduced feelings that White people in general suffer from reverse discrimination, but had no effect on feelings of self-efficacy in dismantling White Privilege.

#34 ***Emotional Reactions to Videos that Educate People about White Privilege***
Treshain Norfleet
Faculty Sponsor: Chris Wetzel, Department of Psychology
White Privilege is a systematic privilege throughout American society that gives White Americans an unearned privilege, whether or not they are knowledgeable of the existence of this privilege. I tested whether two videos (Tim Wise's "The Pathology of Privilege" and White Privilege Conference, "White Privilege 101: Getting in on the Conversation") influenced White students' self-esteem, feelings of depression, and general positive affect (happiness, gratefulness, hopefulness, joyful, proud). Participants were randomly assigned to either self-affirm three important values or affirm a celebrity's values before viewing the videos. The Wise video created a video main effect on depression and self-esteem, inducing more depression and lowering self-esteem. The self-affirmation manipulation also induced more depression. There were no positive affect effects. When I included non-White participants, an affirmation by race interaction emerged, showing that non-Whites who self-affirmed had lower depression scores. I will discuss these findings with self-affirmation theory and ego-defensiveness.

#35 ***The Effects of Learning about White Privilege on White Guilt***
Preston Reeder
Faculty Sponsor: Chris Wetzel, Department of Psychology
White Privilege or Racial Privilege is a term used to talk about unearned privileges that people have simply because of the color of their skin. It is generally more of a cultural or societal entity than a personal prejudice that people have and thus goes unnoticed and unacknowledged by people that benefit from it. This study focused on how best to educate people about white privilege. I compared the effects of two videos meant to educate people on white privilege on how they influenced white remorse, also called white guilt. The four types of white remorse I measured were personal guilt (self-ratings of the emotions of guilt shame, disgust, anger), generalized guilt (similar ratings about feelings towards others), collective guilt (beliefs about whether whites should feel guilty), and white pride or the opposite of remorse (beliefs that Whites have much to be proud of). Talking about white privilege can threaten people's social identity and cause them to feel guilty or upset. To counteract this, I randomly assigned people to affirm three important personal values or to affirm three values showed by one of two celebrities before watching the videos. All four of my measures showed that Tim Wise's video, *The Pathology of Privilege*, created significantly more white remorse in white students than the white privilege conference video, *White Privilege 101:Getting in on the Conversation*. There were no differences between the affirmation manipulations. An interesting note is that adding non-white students to the sample showed that they had less generalized guilt directed at others and marginally less collective guilt than the white students. I will talk about why Wise's video causes more guilt and whether it appears to be a good method of getting people to accept the notion of racial privilege.

#36 ***The effect of self-affirmation and racial privilege education films on beliefs about a just world and white oppression as well as empathetic and positive interpersonal affective, reactions to racism.***
Steven Streitfeld
Faculty Sponsor: Chris Wetzel, Department of Psychology
"White Privilege" or "Racial Privilege" refers to unearned advantages that a white person accrues from society due to skin color, and it is largely unacknowledged by Whites. I randomly assigned students to watch one of two films, Tim Wise's *On White Privilege: Racism, White Denial & the Costs of Inequality (2007)*, or *White Privilege 101: Getting in on the conversation (2005)* to determine if racial privilege films had a significant effect on white participants' perceptions concerning white-focused discrimination awareness, belief in a just world, and percieved racial empathy as well as a measure of positive interpersonal affect. In addition to the film conditions, prior to the video half of the participants performed a self-affirmation task and the other half a similar filler task to see if this increased racial privilege awareness. The Wise video induced significantly more empathy about racism and acceptance that whites oppress others, and it decreased just world beliefs than did the White Privilege 101 film. There were no video effects on positive interpersonal affect (feelings of loving, empathy, etc.), nor did the affirmation manipulation produce any effects. I will address why the Wise video has a greater impact on viewers.

#37 ***The Effects of Educating People About Racial Privilege on Affirmative Action Beliefs and Racial Prejudice***
Jasmine Tate
Faculty Sponsor: Chris Wetzel, Department of Psychology
Contrary to popular belief, privilege and racial discrimination lie more within culture, institutions, and social norms than within individuals themselves. "White Privilege" (or "Racial Privilege") particularly refers to the unearned advantages that a

White person accrues from society due to the color of their skin. Privilege and discrimination are different sides of the same coin, and while discrimination is acknowledged, privilege is largely unacknowledged by those in power (Whites), thus making it a difficult concept to teach. I investigated the effects of two videos about White privilege on subtle forms of racial prejudice (Modern Racism Scale), White college students' objections to affirmative action, their support for affirmative action in the form of providing equal opportunities, and their emotional reactions to the videos in the form of diffuse negative affect (upset, bothered, uneasy, distressed and frustrated). Also, students were randomly assigned to either affirm three important personal values or affirm three values exemplified by a celebrity (Betty White or George Clooney) before watching the videos. Tim Wise's video, "The Pathology of Privilege," induced significantly more negative affect, more support for equal opportunity, and less modern racism than did the White Privilege Conference video, "White Privilege 101: Getting in on the Conversation." There were no effects for the affirmation manipulation. In addition, when I compared the data from non-White students, they had less negative affective reactions to both videos than did White students, were marginally less supportive of equal opportunity affirmative action, and were marginally more objective to affirmative action. Based upon these results, I was able to conclude that, although the Wise video may be more emotionally upsetting, it still increased support for affirmative action in the form of increasing equal opportunities.

#38 ***Two educational videos on White Privilege compared: Does increased awareness of discrimination lead to increased racial fear?***
Nicholas Gilgenbach
Faculty Sponsor: Chris Wetzel, Department of Psychology
Two videos were used to educate people about racial privilege: Tim Wise's 'The Pathology of Privilege," and a video from the White Privilege Conference, "White Privilege 101; Getting in on the Conversation." I wanted to look at how these videos impacted participants' awareness of discrimination, as well as whether or not that awareness would lead to the realization of the existence of racial privilege. I was also interested in looking at whether or not these realizations increased feeling of fear (being afraid, scared, threatened, vulnerable, and anxious), especially directed towards people of other races. Both discrimination measures found that the Wise video was more effective at increasing awareness than the Conference video. No video or affirmation effects were found for either fear measure. There was a race by fear interaction that qualifies the video main effect on awareness that discrimination logically implies racial privilege. The Wise video created more awareness for whites than the Conference video, but for non-Whites the effect was non-significantly in the other direction. Therefore, among Whites, increased awareness of discrimination and privilege did not increase levels of fear or fear of other races.

#39 ***Can a Chairman be a Woman? An Examination of the Implicit Comprehension of Gender-Biased Language***
Mary Godfrey
Faculty Sponsor: Katherine White, Department of Psychology
Past research has shown that the associations we make with gender can bias the comprehension of occupational terms. The aim of this study was to examine implicit (i.e., automatic) associations of generic masculine (GM) terms (e.g., chairman). Historically, research has shown that GM terms are comprehended as exclusive of women, but the majority of this research used explicit measures (e.g., self-report) to assess these biases. Furthermore, today's college students have been taught that GM terms imply inclusion of males and females. An implicit priming procedure assessed activation of masculine and feminine interpretations GM. Female Rhodes students listened to sentences containing "prime" terms with a neutral suffix (e.g., –person) or a GM suffix (e.g., –man) spoken by either a male or female voice. Following presentation of the occupational prime, participants responded to visually-presented male, female, or place target names. Responses to male targets were faster than responses to female targets when a male speaker presented a GM term, while responses to female targets were faster than male targets when a male speaker presented a neutral term. When both the GM and neutral term were spoken by a female voice, responses to male and female targets did not differ, suggesting a neutralizing effect of the female voice. This research provides insight into our mental representations of "biased" terms.

#40 ***The Effects of Emotionally Charged and Taboo Words on Speech Production***
Anne-Chevette Rhynes, Ryan Landry, Anna Reilly
Faculty Sponsor: Katherine White, Department of Psychology
This experiment explored the role of emotion in speech production. Participants performed a picture-word interference task (PWI) where they named target pictures that were superimposed with one of four types of emotional distractor words: negative, neutral, taboo, and positive. The emotional distractor words were also either phonologically-related or unrelated to the target picture. Filler pictures paired with unrelated distractors were presented after every target trial to investigate potential carryover effects from negative and taboo trials. Picture naming times were slowest when target pictures were accompanied by taboo words, and this delay in speech persisted to naming of the filler picture. Additionally, picture naming times were faster when targets were accompanied by phonological compared to unrelated distractors, and this phonological

facilitation was largest in the taboo condition. These results are consistent with research showing that strong emotional words capture attention, and with a model of speech production that includes a verbal self-monitoring mechanism.

Fine Arts

#13 ***Axis Memphis Art Zine***
Brannen Vick, Lucy Gaines, Sarah Knowles, Dianne Loftis
Faculty Sponsor: Liz Daggett, Department of Art
We wanted to begin a conversation among Memphis artists that would extend beyond the community. Then we saw Mark Nowell's "Bluff Magazine," a zine he produced a while back here in Memphis. The novelty of low-cost, easily accessible, and tangible art was instantly something we wanted to bring back. At no financial cost to the viewer, anyone can pick up one of these zines and interact with art. Some might throw it away while others hang clippings on their walls, but everyone will have seen and responded to the art. The burgeoning art community here in Memphis is exciting, and one we want to share with the greater community. By placing flyers around Memphis, an ad in the Memphis Flyer online classifieds, and asking local artheads to participate, the response should be largely positive and should draw from a variety of communities. This gives artists of any description the opportunity to show their work in a public format.

#14 ***The Evolution of Harp Music and Construction***
Mae Gillespie, Leerin Campbell, Ye Zheng, Linlin Qiu, Suzanne East, Rhodes College; Kelly Dodson, Department of Music, University of Memphis
Faculty Sponsor: Gina Neupert, Department of Music
The Rhodes College Harp Ensemble presents their research in the evolution and history of harp construction and music. Since biblical times, the harp has been an important instrument in many cultures and to this day continues to contribute to a variety of musical genres. In ancient times, harps were used in the recitation of epic poetry, which played an important role in passing down traditional stories and pieces of ancient literature. Throughout the Medieval and Renaissance periods, harp construction began to change and the development of the pedal harp action brought a greater complexity to harp music. The Baroque and Classical periods of music also brought important developments in style and technique. In addition to the European classical styles, the harp department also studies many genres of music that come from Latin America and Asia, which contribute to Rhodes' well rounded education. Modern harp music combines many elements of European classical music with stylistic elements from other cultures and has broken into unique areas of experimentation. The history and evolution of harm music and construction is an important area of study, which builds a strong foundation for the trajectory and development of new innovative musical styles of the modern era.

Humanities

#17 ***Deaf Literacy 1: Social Awareness and Community Involvement***
Colleen Parrish
Faculty Sponsor: Lori Garner, Department of English
According to an article in Epidemiology and Community Health, "deaf people are disabled more by their transactions with the hearing world than by the pathology of their hearing impairment" (Munoz-Baell, 2000). This idea can be attributed to how the mainstream hearing world tends to stereotype those that are deaf. Throughout our own history, "deaf people were among the thousands of disabled immigrants turned back each year at U.S. ports as 'defectives' and 'undesirables'" (Baynton, 2006). Even today, there is often a social rejection and alienation of the deaf, leaving them with little education, low status jobs, and low incomes (Munoz-Baell, 2000). In order to prevent these assumptions about the deaf community, there needs to be an increased awareness of the effects that these negative stereotypes have on them, which is why several empowerment and acceptance programs have been created all around the world. Deaf Family Literacy Academy of Memphis is one such program in our city that is dedicated to the development of language and comprehension skills of deaf children in order to promote educational equality with their hearing peers. By holding events like Signed Story time and providing deaf mentors they are able to achieve this goal.

#18 ***Deaf Literacy 2: Performing Arts and Storytelling***
Nguyen Khuong Tran
Faculty Sponsor: Lori Garner, Department of English
Performing arts and storytelling both promote a sense of community among the deaf and help channel deaf perspective into the hearing world. Within performing arts, deaf dramatists and actors have met with increasing recognition (Schuchman, 2004). Meanwhile, since the end of the nineteenth century, public presentation of deaf poetry has provided platforms for the deaf to demonstrate the validity of sign language and improve public appreciation for deaf arts (Hartig, 2007). Since poetry performance requires the artist to make connection with both deaf and hearing audiences, deaf poetry has grown to be a more collaborative process (Bauman, 2003). Deaf story-signers also reach out to share their experience of joy, isolation, and beauty (Esmail, 2008). They often identify with nonhuman objects, which cannot speak for themselves, and project onto these objects their deafness and worldview (Sutton-Spence, 2003). Here in Memphis, storytelling has been met with great response through "Read with me, Sign with me," a monthly signed storytelling event that brings together children with hearing loss and their parents. Thus performing arts and storytelling are not only the creative fabric that weaves the deaf community together: they also display the richness of deaf culture and complete our view of humanity as a whole.

#19 ***Deaf Literacy 3: Integrated Learning Environments***
Ivy Thompson
Faculty Sponsor: Lori Garner, Department of English
American Sign Language (ASL) has proved to be a beneficial method of communication in the deaf community, even after the invention of the cochlear implant. Previous research studies convey that those who use sign language have been shown to have earlier and higher levels of comprehension and language acquisition (Ortiz & Roche, 2008). However, other studies have shown that using a variety of integrated approaches, from infancy, is more beneficial to deaf children than is using one single method (Easterbrooks et al, 2010; Golos, 2010; Stokoe, 2001). My research investigates how the integration of different teaching methods and learning environments aid deaf students in improving comprehension and language acquisition. The combination of learning ASL and being involved in other activities (i.e., crafts, watching movies, etc.) amplifies deaf students' comprehension levels. A possible implication could be that deaf students need to have a connection to their own community through sign, no more than they need to be creatively immersed in activities of the larger community. In the Deaf Family Literacy Academy of Memphis, deaf students taking field-trips outside of their community, and participating in things like Signed Story Time within their community, seem to be the principal aspects of comprehension improvement.

#20 ***Deaf Literacy 4: Pedagogy***
Jasper Page
Faculty Sponsor: Lori Garner, Department of English
Educational researchers have advocated a range of approaches in teaching American Sign Language, such as computer-assisted language learning, contact signing, and experiential learning. One fundamental technique in teaching ASL is the use of fingerspelling. Carol Padden uses fingerspelling in the method of "chaining," in which teachers link signs (by drawing or acting out words), written words, and fingerspelling to explain the concept or words to a bilingual audience (2003). As an alternate approach, Maria Mertzani addresses teaching strategies through a technological medium. Through a study involving four Teaching Assistants' use of computer-assisted language learning (CALL) on five British Sign Language students, Mertzani concludes that CALL has had a positive impact on the students. Based on experience with public classes offered, I assert that these strategies are more effective when the instructor teaches from a social, cultural perspective and not solely from using linguistic rules, since according to Russell Rosen, students learn languages better in this way (2010). Ruth Ann Schornstein further reinforces the aforementioned assertion, since she advocates instruction through suitable cultural etiquette (2005). Through these methods, ASL ultimately appears less of a theoretical and more of an experiential contact signing system.

#9 ***Remote Control: Judging Animated TV as an Instructional Medium for American Kids***
Mason Asbury, Tyler Springs, Joseph Barlia
Faculty Sponsor: Gail Murray, Department of History
This project will explore the idea that animated American televisions shows targeted at Generation Y youth audiences (those born mid-1980s and onward) are a major factor in the development of social and cultural awareness among American children. We have chosen to focus on The Simpsons and South Park; both are known for their popularity among youth and their commentary on cultural issues. To identify the effects of these shows on youth, we will examine 2 episodes from each show that deal with two issues of the time: drug use and environmental issues. We will record observations based on the date of each episode and the issues raised within so that we can compare how two different shows instruct the perceptions of

youth audiences with regard to the content. We will also examine research regarding the characteristics of Generation Y, and examine how these attitudes may increase the impact of animated television shows on these youth. Through this research, we seek to highlight the messages that youth receive from these shows, the variety of ways that animated television tries to shape the ideas of young audience members, and the possibility that watching these shows could increase the cultural awareness of Generation Y children.

#10 ***Poliovirus: Examining the Psychological Affects of an American Childhood Disease***
Kirby Bennett, Lanier Flanders, Lydia Garcia, Brooke Bierdz
Faculty Sponsor: Gail Murray, Department of History
This project seeks to examine the varying experiences of children affected by the poliovirus in the United States from the 1930s to the 1960s. We will compare the psychological effects of this traumatic illness amongst American children in relation to socioeconomic class. In other words, did all children experience the same emotional trauma, or was this response inflated or deflated by one's status? In addition to class, we will also inspect the role of ethnicity and geographic location in light of polio treatment.
In order to test the discrepancies of the childhood polio experience, we will utilize primary sources, such as letters, journals, and newspapers, as well as empirical data. Although the poliovirus marked all children regardless of class, ethnicity, or location, we theorize that the treatment, rehabilitation, and life afterwards was not universal. More importantly, we seek to examine whether or not the treatment for poliovirus nurtured the "whole child" and the psychological consequences of this debilitating disease.

#11 ***The History of Eroticization of Adolescent Girls in Pageantry***
Abbie Gardner, Nicole Schmader, Anuj Sharma
Faculty Sponsor: Gail Murray, Department of History
In this project we investigate the media's portrayal of adolescent girls today through child pageants and juxtapose it with the way young girls were represented in child pageants in the 1970's. We examine differences in what the children wear and the talent they are expected to show in the different time periods to help illustrate the cultural differences that led to the eroticization of adolescent girls and the media's portrayal of them. We will use scholarly articles as well as the television program "Toddlers and Tiaras" to compare the differences between the two time periods. We argue that children are voluntarily and involuntarily becoming sexually objectified through beauty pageantry.

#12 ***The Past and Present Orphan***
Daniel Gilham, Lauren Lee, David Bergen, Sarah Joyner
Faculty Sponsor: Gail Murray, Department of History
Where is the modern orphan? After the disbanding of institutions previously called "orphanages", foster care has inherited the responsibility for the caretaking of displaced youth. Our project will interrogate modern foster care's provision for the education, personal enrichment, psychical health, and physical wellness of the children in question. In our project, we will be comparing orphanages from past eras with the modern foster care system using research from group homes and youth centers in the state of Tennessee. By combining interviews from foster care institutions in Tennessee with historical research, we will investigate similarities and differences between historical orphanages and their modern replacement. Drawing from past and present sources, namely scholarly articles and interviews with active foster care organizations, we will argue that the modern foster care system has largely failed to provide sufficient educational and personal resources necessarily for the assimilation of abandoned and orphaned children into society.

#24 ***Shirley Temple: Eroticization and The Rise of the Child Star***
Amanda Harris, Jenny Bitzer, Emily Collins, Amanda Harris, Abby Lewis
Faculty Sponsor: Gail Murray, Department of History
For this project we will investigate Shirley Temple's early stardom in the 1930s and 1940s, examining the cultural context in which she emerged. Female starlets are always subject to pressures of embodying the female ideal; Shirley Temple is not an exception. We will show how Shirley Temple changed the perspective of the ideal female child through her films and stardom. We will also examine how Shirley Temple's roles were often highly eroticized for her age. In order to have a comprehensive understanding of her career, we will look at several of Shirley Temple's films including Baby Burlesque and The Little Princess, scholarly articles about her as an icon, and Shirley Temple's autobiography. Through our research, we hope to develop an understanding of what sort of cultural influences caused Shirley Temple to become a paradoxical star who was childlike yet highly erotic.

#25 ***Female Athletes: Shaping Up to Society's Standards***
Chloe Lainhart, Molly Glaser, Lauren Peterson
Faculty Sponsor: Gail Murray, Department of History
We will analyze how subjective scoring, revealing attire, and weight categories/BMI restrictions all contribute to unhealthy and unrealistic expectations for female athletes in the 21st century who participate in gymnastics and track. We will then discuss the health threats that arise out of female athletes' desire to succeed and their coaches' desire to win. These health threats include, but are not limited to irregular menstrual cycles, low bone density, and eating disorders, which is commonly referred to as the female athlete triad. For this project, we will interview athletes at Rhodes and other institutions, look at health statistics, and extract information from a variety of secondary sources including psychology journals, health journals, and fitness magazines. We will demonstrate how societal expectations for female gymnasts and track runners to be "fit" or "thin" leads to their health problems and distorted body image ideals.

Natural Sciences

#43 ***Modeling Allele Frequencies in a Population***
Melissa Coquelin
Faculty Sponsor: Erin Bodine, Department of Mathematics & Computer Science
Population genetics is concerned with genetic variation in natural populations, focusing on the evolutionary processes that affect allele and genotype frequencies. A typical model for genotype and allele frequencies, known as the Hardy-Weinberg model, demonstrates how allele and genotypic frequencies remain constant from generation to generation under certain assumptions. However, there are four evolutionary processes that cause deviations in allele frequencies: mutation, genetic drift, gene flow (migration), and natural selection. Three models, created by Phillip Hedrick, track allele frequencies in a small (endangered) population with migration from a larger population and account for natural selection. The effects of a sex linked trait, carried by only the male or female parent, also affects allele and genotype frequencies. I propose a new model, based on Hedrick's models, which takes into account the effects of a sex linked trait, gene flow, and natural selection. Over time an equilibrium state is met, in which there is no change in allele frequency between generations.

#44 ***Effect of gate delay on the frequency dependence of ultrasonic backscatter measurements of bone***
Joseph McPherson, Morgan R. Smathers, Brent K. Hoffmeister
Faculty Sponsor: Brent Hoffmeister, Department of Physics
Osteoporosis is a degenerative bone disease that causes normally porous bone tissue, called cancellous bone, to become even more porous and weak. We have proposed that ultrasonic backscatter measurements may be sensitive to these changes in bone porosity. Backscatter signals were analyzed by computing the power spectrum of a gated region of the signal. The gate was delayed by an amount Td from the start of the signal. The goal of this study is to determine how the gate delay Td affects the measured frequency dependence of the backscatter power. Measurements were performed on 36 cube shaped specimens of human and bovine bone using a 5 MHz transducer. The gate delay Td ranged from 0 to 6 µs, and the gated region had a fixed length of 2 µs. Backscatter signals were analyzed to determine the slope of the frequency dependence of the power in the gated region of the backscatter signal. This parameter is called FSAB. Measured values of FSAB were plotted as function of specimen density and a linear regression was performed to determine the correlation of FSAB with density. The correlation coefficient, r, ranged between -0.96 to -0.86, improving with gate delay up to a delay of 1 µs. Delays greater than 1µs did not improve the correlation.

#45 ***A new ultrasonic technique for detecting changes in bone density caused by osteoporosis***
Mark Sellers, Morgan Smathers, Joseph McPherson, Brent Hoffmeister
Faculty Sponsor: Brent Hoffmeister, Department of Physics
The medical community is interested in finding new techniques to measure bone density to track osteoporosis. We have proposed a technique using ultrasonic backscatter, which occurs when an ultrasonic signal interacts with porous bone. We used a 5 MHz transducer to measure the backscatter signal on 35 cube shaped specimens of human and bovine bone. A difference spectrum was obtained by subtracting the power spectrum of one portion of the signal from the power spectrum of an earlier portion of the same signal. We measured the difference spectra at multiple sites on each specimen to obtain a single spatially averaged difference spectrum for each specimen. The difference spectra were frequency averaged to obtain the mean of the backscatter difference spectrum (MBD). MBD was plotted as a function of specimen density to determine the correlation between MBD and density. MBD was found to increase with density in an approximately linear way. Values for the linear correlation coefficient typically ranged between 0.7-0.9. These results suggest that this backscatter technique

may be sensitive to changes in bone density caused by osteoporosis. This work was supported by a grant from the National Institutes of Health (NIH R01AR057433).

#46 ***Optimal gate delay for ultrasonic backscatter measurements of bone compared to MicroCT measurements***
Morgan Smathers, Joey McPherson, Brent Hoffmeister
Faculty Sponsor: Brent Hoffmeister, Department of Physics
Osteoporosis affects 10 million Americans. Our study seeks to develop a method for measuring bone density using ultrasonic backscatter. Ultrasonic pulses from a 5MHz transducer were propagated into regions of porous bone. The returned signal was analyzed to determine Apparent Integrated Backscatter (AIB) which is a measure of the frequency averaged backscatter power. Measurements were performed on 18 cube shaped specimens of bone prepared from 5 human femurs and one bovine femur. AIB was determined from 14 different gated regions of the backscatter signal. All gated regions had a duration of 2 microseconds. The gates differed according to their delay from the start of the backscatter signal, ranging from 0 to 6 microseconds in 0.5 microsecond increments. AIB is compared to several parameters taken using a MicroCT scan including relative bone volume and trebecular number. These parameters were also correlated against measured densities. We conclude that choice of gate delay has an important affect on how well AIB correlates with the relevant MicroCT parameters. Gate delays of 2 microseconds or greater appear generally optimal.

#53 ***Elephants after Dark: Assessment of Environmental Changes to Reduce Stress in Captivity***
Margaret Blake, Alison Lang, Stephen Leavelle, Sandra Videmsky, Rhodes College; Fields Falcone, Andrew Smith, Amanda Hadicke, Katrina Knott, and Andrew Kouba, The Memphis Zoo
Faculty Sponsor: Sarah Boyle, Department of Biology
Due to the nature of captivity, elephants in zoos inevitably live in conditions unlike those found in their natural environment. As a result, captive elephants are often subject to stress and suffer from several health issues, frequently relating to their feet. In an attempt to reduce this stress, the Memphis Zoo, home to three female African elephants (Loxodonta africana), is making changes to their elephant exhibit. In mid-November 2011 the zoo replaced the concrete floor of the elephants' indoor enclosure, the "Elephant House," with a spongier, more shock-absorbent flooring. Cameras were installed to gather nighttime video of the elephants both before and after the change in flooring. From these video data, approximately 430 hours, the activities and sleeping patterns of the elephants are currently being observed and recorded, in order to determine any quantifiable difference in behavior between the pre- and post-flooring. This preliminary video analysis is part of a larger ongoing project researching elephant behavior. The video data are complemented by live behavioral data collection, and these data will be further supplemented by analysis of blood assays of the elephants, testing the hormonal levels of the elephants before and after the new flooring.

#54 ***Analysis of behaviors and spatial preferences in snow leopards (Uncia uncia) housed in captivity***
Kimber Jones, Sarah Boyle, Rhodes College; Andrew Kouba, The Memphis Zoo
Faculty Sponsor: Sarah Boyle, Department of Biology
Attempts at breeding snow leopards (Uncia uncia) in captivity are generally unsuccessful but could be improved by environmental enrichment in the form of pair bonding. Pair bonding could reduce stress and the resulting stereotypic behaviors thereby increasing successful copulations. In order to assess if a pair bond exists between a young male and female snow leopard pair housed at the Memphis Zoo, behavioral data were collected in accordance with an ethogram and spatial data were plotted on an exhibit map for 50 observation hours. Both leopards spent a higher percentage of time exhibiting social behaviors than self-interactive behaviors (social: 8.57% ± 2.86% SE; self-interaction: female: 0.83% ± 0.21%; male: 1.20% ± 0.27%). Stereotypies were one of the two behavior categories exhibited for the smallest percentage of time for both cats (female: 0.478% ± 0.32% SE; male:1.62% ± 0.78%). ArcGIS analysis revealed that both leopards spent a large portion of time resting together on the cliffs of the exhibit, near their water container, and along the edge of their exhibit nearest the capybara exhibit. Further study could help determine if the leopards have made a bond that could predict successful matings after they reach sexual maturity and continue to reduce stereotypies.

#58 ***The Social and Economic Implications of Green Space in Memphis, Tennessee***
Brian Lainoff, Jennifer Sciubba
Faculty Sponsor: Jennifer Sciubba, Department of International Studies
Proponents of green initiatives have justified the use of taxpayer dollars by claiming that green spaces raise real estate value, reduce crime, create jobs, and decrease energy consumption in areas of economic turmoil. Do such initiatives bring benefits that outweigh the costs in cities that face serious economic and social challenges? In this paper, we examine the effects of green initiatives on their surroundings in Memphis, Tennessee, focusing on the areas nearby or connected to Overton Park. We find that the initiatives raised property value, created jobs, decreased energy consumption, and reduced crime. While the

tax dollars put into the creation of green spaces may not show immediate results or evenly benefit citizens, individual members of the community surrounding the green spaces will see an increase in their quality of living. The success of green initiatives in Memphis demonstrates that poverty, crime, employment, and questions of energy can be addressed in cities with similar issues through the creation of green spaces.

#59 ***Birds of the Maine Coast: GIS Analysis of Seabird Reintroduction Islands and Shorebird Habitat Status***
John Menz
Faculty Sponsor: Sarah Boyle, Department of Biology
The coast of Maine is home to a diverse array of seabird and shorebird species. The early 20th century saw seabird populations at an extreme low, which resulted in a near-local extinction of the Atlantic Puffin (Fratercula arctica). Reintroduction efforts began in the 70's with the placement of Newfoundland F. arctica chicks on specific coastal islands by Project Puffin. Today the population is stable along with many other seabird species. Shorebirds that nest on sandy beaches face more pressure than seabirds nesting on islands due to their proximity to human population centers. Because of varying levels of protection, public access, and disturbance on mainland beaches, species such as the least tern (Sterna antillarum) and the endangered piping plover (Charadrius melodus) can face different degrees of pressure depending on where they nest. Using ESRI ArcGIS 9.3 software I will analyze the population of F. arctica over the course of their reintroduction to specific Maine coastal islands. In addition, I will analyze known nesting sites of S. antillarum and C. melodus to assess their proximity to conserved lands and population centers, the level of protection these sites receive, and the amount of traffic these sites receive during the summer tourist season.

#60 ***Outdoor Movement and Location Behavioral Observations of African Elephants (Loxodonta africana) in Captivity***
Kelly Patton, Madison Marullo, Laura Wagner, Jennifer Marshall, Rhodes College; Andrew Smith, Amanda Hadicke, Andrew Kouba, The Memphis Zoo
Faculty Sponsor: Sarah Boyle, Department of Biology
One of the most important medical issues for captive African elephants (Loxodonta africana) is foot problems. On average a female African elephant weighs 4 tons and spends most of the day carrying this weight on its four feet. There are three female elephants at the Memphis Zoo: Ty (48 years old), Gina (29 years old), and Asali (27 years old). A new floor that is designed to help with the foot problems that captive African elephants face was installed in mid-November 2011. We have been collecting behavioral data and movement/location data in one hour shifts for a total of 23 hours a week since May 2011. Behavioral data are collected using scan sampling at 2-minute intervals in order to determine an activity budget. Movement and location data are collected on each focal animal for 20 minutes, collecting locational data at one-minute intervals and tallying the number of steps taken per minute. Our research examines the differences in movement and location behavior outside before and after the floor was installed.

#61 ***Elvis: Today, Tomorrow, and Forever***
Rebecca Vandewalle, Adam Alsamadisi
Faculty Sponsor: Sarah Boyle, Department of Biology
To pay respect to the fantastic city that has fostered our academic curiosity and growth during our years at Rhodes, we created a map that pays tribute to one of our city's most valued icons, Elvis Presley. His legacy, as we hope to show, really knows no spatial boundary. While some capitalize off the Presley Personality, others pay tribute to him by forming charitable fan clubs. We also must reference the land he graced performing his sacred songs, and display cities with an unusual groups of rock and roll fans. We've used the Elvis Concert databases, spatial ecology tools, and messages boards to represent these folks and the trails of theirs and our, Elvis Presley. Our project began by transcribing official message board data and database files into Microsoft Excel, and then pulling it into ArcGIS 9.3 to geocode addresses, interconnect routes, and display spatial components. We had to create address locators in ArcGIS to provide our data with geographic coordinates. We used Hawth's Spatial Ecology tool to create lines that tracked the Beast during his years of live performances. Elvis' music and persona are ingrained with the style of the Mississippi Delta and the history of Memphis' unique, eclectic community.

#62 ***The Effects of Chinese Privet (Ligustrum sinense) on Soil Composition at Shelby Farms***
Nolan Bielinski, Alex Nord
Faculty Sponsor: Rosanna Cappellato, Department of Biology
Invasive plants are nonnatives that are able to outcompete native plant species and promote detrimental changes to the natural balance of ecosystems. Chinese privet (Ligustrum sinense) is an invasive plant in the southeast United States, including Tennessee, where it is ranked as a "severe threat". Privet reduces local plant biodiversity because it shades light from native vegetation and forms dense monospecific patches that can dominate forests. Shelby Farms Park is one area of Tennessee at risk, as privet covers 1,100 to 1,200 acres. In our study, we will measure and compare soil nutrients between privet-infested

areas and privet-free areas of Shelby Farms. We will measure pH, nitrogen, phosphorus, and potassium levels of the soil and use an unpaired parametric student's T test to determine whether there is a significant difference in soil nutrients between privet-infested areas and privet-free areas. We hypothesize that privet-infested areas will have a lower pH, higher nitrogen levels, and either similar or lower levels of potassium and phosphorus.

#63 ***Analysis of Pollution and Biodiversity Levels in Patriot Lake at Shelby Farms***
Theodore Boozalis, Ryan Costello
Faculty Sponsor: Rosanna Cappellato, Department of Biology
The objective of this project was to evaluate pollution and biodiversity levels in Patriot Lake at Shelby Farms and compare findings to those of other lakes. We hypothesized that pollution levels would be relatively low at Patriot Lake, and we expected these low pollution levels to be associated with high biodiversity, upon comparison with other published literature values. Alternatively, if pollution levels were high, then we expected to see correspondingly lower levels of biodiversity. Thirteen water samples were taken periodically around the entire perimeter of Patriot Lake, and an array of pollution levels were measured, including sulfide, dissolved oxygen, free carbon dioxide, salinity, phosphorous, pH, nitrate, copper, chromium, chloride, chlorine, alkalinity, total hardness, calcium hardness, and magnesium hardness. At each sample site, benthic macroinvertebrates were collected, and used to evaluate alpha and beta diversity. Possible correlations between biodiversity and pollution levels were then investigated, and lake-wide results were compared to those of other lakes.

#64 ***Carbon Sequestration and the Monetary Value of Shelby Farms Park, Memphis, TN***
Allie Dillon, Kathy Marr
Faculty Sponsor: Rosanna Cappellato, Department of Biology
With global temperatures rising, more attention is being brought to atmospheric carbon levels and methods of carbon storage and sequestration. Some of the biggest carbon stores are located in forests. As a result, carbon sequestration rates and levels of stored carbon are being calculated in forests. Additionally, the stored carbon is given a monetary value in order to promote forest preservation and conservation and to give forests an economic value. This research promotes the preservation and creation of urban parks and their value for mitigating the effects of increasing levels of atmospheric carbon dioxide. Our research was focused in Shelby Farms in Memphis, TN. Shelby Farms is a 4,500 acre park that offers hiking trails, fishing, and other recreational activities. In the park, we measured the diameter at breast height (DBH) along a number of hectares of forest along several transects. We then calculated the carbon stored for the entire park and the rate of sequestration using allometric equations. Carbon storage was also measured along the non-wooded areas in the park. Lastly, we gave the park a monetary value based on the amount of carbon stored and the rate of sequestration.

#65 ***Calculating the Biodiversity Within Two Different Agricultural Fields based on Soil Texture and Chemistry***
John Paul Garry, Megan Hauver, Melissa Welch
Faculty Sponsor: Rosanna Cappellato, Department of Biology
One of the leading causes of habitat destruction is agricultural development, which in turn causes a loss in biodiversity. Agricultural development is due to the rapid increase in the human population just over the past few hundred years. Species biodiversity is dependent on many different factors, including abiotic and biotic factors. We will be focusing on abiotic factors in an agricultural field and an urban forested protected area. These abiotic factors will relate to the fungi biodiversity. Primary abiotic factors such as soil chemistry and soil texture impact community structure, which can be represented by fungi biodiversity. Using the Shannon-Weiner Index and the Simpson's Index, we studied the fungi biodiversity of two different landscapes, an agricultural field and an old growth forest. We collected twenty soil samples from each location, and then tested pH, nitrogen, and phosphorous levels. Then we plated each of the samples on RBSA medium, and incubated them for one week. Finally we differentiated each of the different fungi based on color and texture. We expect to find a correlation between soil texture and chemistry with biodiversity, and a greater biodiversity in the old growth forest.

#66 ***Carbon uptake and sequestration assessment of Memphis, TN green canopy coverage as a tool to promote the conservation of Memphis wooded parks.***
Kathryn Marr, Rosanna Cappellato
Faculty Sponsor: Rosanna Cappellato, Department of Biology
This study estimated the amount of carbon sequestered and stored in the above-ground Memphis urban forests, using allometric equations (TerMikaelian and Korzukhin, 1997). We measured tree Diameter at Breast Height (DBH) at Audubon Park (a 22.8 ha open park with a basal area of 10.0 m2/ha) and Lichterman Park (a 26 ha protected park with a basal area of 32 m2/ha) and used Google Earth Pro to measure canopy coverage of the entire city of Memphis. We found the rate of carbon sequestration to be 1.6 tC/ha/yr for Audubon Park, and 3.8 tC/ha/yr for Lichterman Park, which translates into a total of 29 072 tC/yr for Memphis urban canopy (23 445 ha). These data are comparable to those for Atlanta (1.23 tC/ha/yr), as reported

by Nowak and Crane (2002). Our findings underscore the importance of pursuing and strengthening current policies for conserving natural forests within the urban environment.

#67 ***Soil Nutrient Analysis and Plant Biodiversity at Epping Way, Memphis***
Jessica Newman, Madison Marullo
Faculty Sponsor: Rosanna Cappellato, Department of Biology
The area of Epping Way in northeast Memphis has seen numerous ecological changes over the last century. Its roles have shifted from family residence and cattle farm to recreational country club and finally, after the club was abandoned in the mid 1980's, to its present state of abandoned concrete slabs and reemerging natural habitats. The Epping Way country club originally contained swimming pools, a clubhouse, and several recreational lakes. Since then the grounds have changed hands several times, eventually becoming the property of Memphis city who recently placed the land under the care of the Wolf River Conservancy. Plans to utilize the area, bordered on its east side by the Wolf River, as an educational center merit a full ecological survey to assess the area's current condition. Our contribution to this effort is a soil nutrient analysis and biodiversity comparison on a transect running southwest through three of five identified plant communities on the property; beginning at the entryway ridge, extending down through a wet prairie, and ending in a bottomland hardwood forest. We anticipate that plant alpha diversity will demonstrate a positive correlation with areas of most ideal soil nutrient levels.

#68 ***Wolf River Macroinvertebrate Biodiversity***
Jordan Robinson, Chelsea Peters
Faculty Sponsor: Rosanna Cappellato, Department of Biology
Biodiversity is a measurable test of ecosystem health and viability. An easy way to assess biodiversity in river systems is by studying the area's macroinvertebrates. Varying from insect larva and worms to mollusks and arthropods, macroinvertebrates have an astounding amount of diversity in body shape, life history strategies, adaptations, and oxygen need. They can be divided into three categories based on dissolved oxygen requirements – sensitive, somewhat sensitive, and tolerant. This variance in tolerance of deoxygenated water makes macroinvertebrates good bioindicators, and their diversity can be used to extrapolate overall ecosystem health. Dissolved oxygen concentration is often negatively correlated with human activity. Our study investigates macroinvertebrate biodiversity, dissolved oxygen content, and pH of the Wolf River, to determine the overall health of the river system. Data will be collected from the Ghost River, Shelby Farms, and downtown Memphis sections of the river, which represent low, medium, and high human impact areas, respectively. We plan on using Simpson Indices, Shannon-Weiner Indices, and percent similarity values to analyze this data.

#69 ***Forest Stand Age vs. Diversity of Cavity Nesting Species: The effect of Primary Cavity Nesters***
Morgan Slevin, Kimber Jones
Faculty Sponsor: Rosanna Cappellato, Department of Biology
In forest habitats, cavity excavation used in avian nesting is both a keystone and ecosystem engineering process. Primary cavity nesters (mainly woodpeckers) excavate cavities, which are also used by secondary cavity nesters unable to excavate their own cavities. Woodpeckers choose trees in which to build cavities based on age-specific characteristics. Trees serve as a limiting resource to both categories of cavity nester. Management concerns for cavity nesting species are moving to the forefront of forest conservation and management practices because cavity-nesting species rely so heavily on old growth forests. The aim of this study is to determine if woodpeckers more commonly use trees in old forest stands and if an increase in woodpecker diversity is correlated to an increase in secondary cavity nester diversity. The study sites are Meeman-Shelby State Forest (old forest) and Shelby Farms (younger forest) where 12 total point counts will be performed to determine species richness (data collection yet to be completed). α-diversity will be calculated by species richness, Simpson's index, and Shannon-Weiner index. B-diversity will be calculated using proportional similarity and dissimilarity indices. Statistical analysis will be performed to determine if older forests had a predicted higher diversity of cavity-nesting species than younger forests.

#70 ***Impact of environmentally-oriented classes on Rhodes students' perceived value of the Memphis Zoo***
Diana Wong, Madeline Jeansonne
Faculty Sponsor: Rosanna Cappellato, Department of Biology
The primary role of city zoos has evolved throughout the past century, ranging from providing an educational experience to serving as a major source of income. Studies have shown that those who visit zoos have a more positive perception of them than those that do not visit zoos. Likewise, environmentally-conscientious citizens tend to primarily appreciate the zoo for its role in species conservation. We will survey 200 Rhodes students to test whether or not students taking environmentally-related classes and courses requiring zoo attendance are more likely to value the zoo from a conservation standpoint more

than students without this exposure. We also expect that environmentally-educated students are more willing to donate money to the zoo than other students.

St. Jude Summer Plus Fellowship

#47 ***Radiation Treatment for Medulloblastoma Survivors Disrupts Normal Reading Acquisition***
Evan Savage, Rhodes College; Robert Ogg, Department of Radiological Sciences, St. Jude Children's Research Hospital
Faculty Sponsor: Kim Gerecke, Department of Psychology
We used fMRI to examine the relationship between acquired reading deficits and therapy-induced brain injury in the extrastriate visual areas of the occipital and temporal lobes of medulloblastoma survivors. The first task we used probed subjects reading acquisition through presentation of a series of words and false-font strings in an implicit reading paradigm; we expected survivors to have longer reaction times during this task when compared to controls. During the task, survivors showed significantly longer reaction times compared to controls when choosing if words or false-font symbols contained ascenders (like l, f, or t). Also, survivors showed significantly lower scores during word recall when given a post-test. The second task examined orthological processing through presentation of letters or false-font symbols and phonological processing through presentation of letter-sounds; again, we expected survivors to show longer reaction times during this task. Survivors showed significantly longer reaction times when determining if letter-pairs were visually the same (like t and t) and when determining whether letter-pairs rhymed (like B and E). Our overall findings suggest differences between controls and survivors in implicit reading performance, and in orthological and phonological performance. This suggests that reading skill acquisition may be reduced in medulloblastoma survivors.

#48 ***Proliferation Study of the Subventricular Zones in GFAP::Cre;SmoM2[fl/+] Mice Brains***
Zongyu Yang, Rhodes College; Young-Goo Han, Shirui Hou, Department of Developmental Neurobiology, St. Jude Children's Research Hospital
Faculty Sponsor: Loretta Jackson-Hayes, Department of Chemistry
The hedgehog (Hh) signaling pathway plays a key role in regulating animal development and is present in all bilaterians. Hh genes have been found in a range of invertebrates as well as vertebrates including mouse and human. The Hh signaling pathway controls many aspects of animal development including brain development. 2 Germline mutations in Hh pathway proteins are associated with developmental disorders, whereas hyperactivation of Hh signaling in human leads to medulloblastoma, the most common malignant brain tumor in children. Constitently, GFAP::Cre; SmoM2[fl/+] mice that expresses a constitutively active mutant form of Smoothened(SmoM2), a master activator of intracellular Hh signaling cascade, develop medulloblastoma but does not develop tumor in the cerebrum. Interestingly, however, these mice show greatly expanded subventricular zones(SVZ), the proliferative zone in the cerebrum, but the SVZ stopped thickening by P2. In the study, mice embryos were introduced with chemicals that incorporated into proliferating cells(Cldu, Edu) at various time point during embryonic and early postnatal development to determine exactly when the progenitor cells in the SVZ start and stop abnormal proliferation.. This study may be able to shed light on why hyperactivation of this signaling does not directly cause brain cancer other than medulloblastoma.

#49 ***Molecular Mechanisms that Influence T Cell Survival***
Anna Kushnir, Rhodes College; Blaine Creasy, Tarsha Harris, Maureen McGargill, Department of Immunology, St. Jude Children's Research Hospital
Faculty Sponsor: Gary Lindquester, Department of Biology
Drak2 is a serine/threonine kinase expressed primarily in B and T cells. We have previously shown that Drak2-/- mice are resistant to type 1 diabetes and multiple sclerosis due to a defect in the survival of autoreactive T cells that lack Drak2. However, Drak2-/- T cells are able to eliminate pathogens, similar to wild type (WT) T cells. Therefore, Drak2 could be a potential therapeutic target to treat autoimmune diseases without compromising immunity to infectious pathogens. In this study, we investigated the mechanism in which Drak2 affects T cell survival. Here we show Drak2 is specifically required for the survival of T cells undergoing proliferation. Utilizing confocal microscopy, we found morphological differences between WT and Drak2-/- activated T cells, suggesting a defect in the ability of Drak2-/- T cells to undergo cell division. In addition, Drak2-/- cells demonstrated defects in metabolism when compared to WT T cells. We also performed immunoprecipitation and mass spectrometry to identify Drak2-interacting proteins, and identified proteins involved in cell cycle progression and metabolic pathways. These results suggest Drak2 is important for progression through cell cycle, and in its absence, proliferating T cells do not survive, which prevents autoreactive T cells from accumulating and causing disease.

#50 ***MicroRNA Alteration of Transcriptional Activity By Gene Promoter Interaction As Monitored By Gold Nanoparticle Aggregation***

Lucas Laudermilk, Rhodes College; Steven W. Paugh, William E. Evans, Department of Pharmaceutical Sciences and Hematological Malignancies Program, St. Jude Children's Research Hospital
Faculty Sponsor: Gary Lindquester, Department of Biology

Recent research suggests that, in addition to interfering with translation and degrading mRNAs, microRNAs may play a role in up-regulating mRNA transcript levels. Two broad categories by which microRNAs down-regulate gene transcript levels have been characterized: direct and indirect. MicroRNAs can either directly interact with mRNAs to down-regulate them, or they can act upon co-factors that down regulate the efficiency of translation. MicroRNAs have also been shown to indirectly up-regulate genes by acting on cofactors that would typically suppress transcription. What has not been characterized is a direct mechanism by which microRNAs up-regulate gene transcripts. Correlations between microRNAs and mRNAs were performed using genome-wide analyses of RNA from pediatric acute lymphoblastic leukemia cells. Another screen involves studying the complementarity between microRNAs and their potential binding sites within gene promoter regions according to the motif of Reverse-Hoogsteen triplex pairings. Interactions of interest are characterized by a combination of high complementarity in target site binding and a positive, significant correlation between the particular microRNA and the particular mRNA associated with the relevant gene promoter. This study is designed to test the hypothesis that microRNAs up-regulate transcription levels by binding to double-stranded DNA to form triplexes at target sites within gene promoter regions.

#51 ***Identifying the role of components of the SHREC complex in the assembly of centromeric heterochromatin in fission yeast***

Wenbin Du, Rhodes College; Janet Partridge, Department of Biochemistry, St. Jude Children's Research Hospital
Faculty Sponsor: Mary Miller, Department of Biology

The fission yeast Schizosaccharomyces pombe contains large blocks of heterochromatin, and shows conservation of many factors that affect heterochromatin assembly. Heterochromatin not only silences transcription of underlying DNA sequences but also prohibits recombination, which is essential for protecting genome integrity. A multienzyme effector complex (termed SHREC) is the homolog of the Mi2/NuRD remodeling complex that constitutes an enzymatic component of a pathway for assembly and maturation of chromatin; it mediates heterochromatic transcriptional gene silencing in fission yeast. SHREC consists of 5 proteins-Clr1, Clr2, Clr3, Mit1 and Chp2-which distribute throughout all major heterochromatin domains to effect TGS. Two components of the complex have enzymatic activity- Clr3 is a histone deacetylase, and Mit1 is an ATPase with similarity to ATP-dependent helicases involved in chromatin remodeling (Mi2). We know very little about the Clr2 component of the complex and whether it performs roles similar to the MTA (Metastasis tumor antigen) components of NuRD. Here we present functional assays to address the role of Clr2 in heterochromatin assembly.

Biology II Laboratory

#71 ***The Effect of Fertilizer Exposure on Mosquito Mortality***
Mike Kuefner, Ryan Niedermair, Zach Pope, Kat Simpson, Monique Hagler
Faculty Sponsor: Michael Collins, Department of Biology

#72 ***Demonstrating Favorability in Food Based Off Color Preference***
Grant Bowen, Liz Karolczuk, Nicole Mackey, Elizabeth Ross
Faculty Sponsor: Michael Collins, Department of Biology

#73 ***Intensity of Light Affects Ability of Duckweed to Purify Water***
Gy Won Choi, Alex Hade, Anna Stachura
Faculty Sponsor: Michael Collins, Department of Biology

#74 ***The Effect of Sex on Aggressive Behavior in Crayfish***
Catherine Eckert, Sarah Johnson, Rachel Sanders, Stephanie Smith, Shelby Wilkinson
Faculty Sponsor: Michael Collins, Department of Biology

#75 ***Cricket Environmental Preference Based on Two Habitat Types***
Alex Degenova, Meredith Kovach, Collin Saleh
Faculty Sponsor: Michael Collins, Department of Biology

#76 ***The Effects of Female Presence on Male Aggression in Crayfish***
Margit Mikkelsen, Sierra Gaffney, Taylor Bass, Kristal Skrmetta
Faculty Sponsor: Michael Collins, Department of Biology

#77 ***The Effect of Temperature on the Rate of Stomatal Opening and Closing in Pansies and Grass***
Rahat Hossain, Bhavna Kansal, Mollie Newburn, Hajar Sakhi
Faculty Sponsor: Rachel Jabaily, Department of Biology

#78 ***Effects of Light Intensity on Crayfish Feeding Behavior***
Houston Haynes, Carlissa Lovette, Adriana Martinez-Lopez, Karl Schwab, Regan Zehr
Faculty Sponsor: Rachel Jabaily, Department of Biology

#79 ***The Effect of Differing Light Wavelengths on Duckweed Leaf Diameter***
Ebony Archie, Blake Harrell, Alyssa Johnson, Nura Muhammed
Faculty Sponsor: Rachel Jabaily, Department of Biology

#80 ***The Effect of Red Light on Development of Stomata Densities in*** **Brassica rapa** ***FastPlants*****.**
Michael Aucoin, Forrest Skelton, Tyler Cummings, Kristen Lowery
Faculty Sponsor: Rachel Jabaily, Department of Biology

POSTER SESSION II
Multisports forum of the Bryan Campus Life Center
4:30 – 6:00pm
Poster Numbers are listed with each title.

Biology II Laboratory

#9 ***The Effects of Varying Light Treatments on Stomata Aperture in Pansies*** **(Viola tricolor*)***
Emily Berenson, Kathryn Cyrus, Tina Dao, Surya Pavuluri, Joshua Tucker
Faculty Sponsor: Carolyn Jaslow, Department of Biology

#10 ***Does the Presence of Shelter Lead to More Frequent Aggression in a Particular Sex of Crayfish?***
Currie Carothers, Memphis Madden, Lucas Grim, Kevin Shum
Faculty Sponsor: Carolyn Jaslow, Department of Biology

#11 ***The Relationship Between Nectar Potency and Feeding Duration of a White Cabbage Butterfly***
Emma Gotbaum, Courtney Haller, Allison Montague, Saujanya Sinha
Faculty Sponsor: Carolyn Jaslow, Department of Biology

#12 ***Chela Size Determines the Initiation of Aggressive Behavior in Same-Sex Crayfish***
Joe Barlia, Robert Lenzini, Amber Sherwood, Sarah Shankle, Katelyn Donaghey
Faculty Sponsor: Carolyn Jaslow, Department of Biology

#13 ***The Effect of High Phosphorus Fertilizer Doses on Duckweed (*****Lemna minor*****) Productivity***
Thomas Beamish, Mackenzie Holland, Dakota Januchowski, Katherine Robinson
Faculty Sponsor: Carolyn Jaslow, Department of Biology

#14 ***Butterfly Sugar Preferences: Can They Tell the Difference?***
Ashley Yu, Sandra Videmsky, Virginia Goss, Katherine Gaker
Faculty Sponsor: Sarah Boyle, Department of Biology

#15 ***Squirrels' Tail Movement: A Method of Communication Among Squirrels at Rhodes College***
Maggie Cupit, Cristine Osteen, Noah Brown
Faculty Sponsor: Sarah Boyle, Department of Biology

#16 ***Environmental Preferences in Crickets***
Meredith Coulis, Allison Doubleday, Caroline Reel, Elyse Smith
Faculty Sponsor: Sarah Boyle, Department of Biology

#17 ***The Effects of Detergent on the Growth Rate of Duckweed***
Erin Lowrance, Marshall Jones, Victoria Honnell, Amber Hunt
Faculty Sponsor: Sarah Boyle

#18 ***Does Water Content Impact Cricket Food Preference?***
Eliza Hendrix, Taylor Weidow
Faculty Sponsor: Sarah Boyle, Department of Biology

#19 ***The Effect of Certain Substrates on Lichen Growth***
Maitland Frilot, Alex Galloway, Summer Preg, Hailey Townsend
Faculty Sponsor: Sarah Boyle, Department of Biology

#20 ***Feeding Preference of White Cabbage Butterflies to Different Kinds of Sweeteners***
Kevin Chien, Autumn Demonbreun, Yoonjee Kim, Jourdaen Sanchez
Faculty Sponsor: Rachel Jabaily, Department of Biology

#21 ***Male Crayfish Competitive Behavior Effected by Presence of Female Crayfish***
Jamara Haymore, Jordan Infield, Denise Lee, Molly Mugford
Faculty Sponsor: Rachel Jabaily, Department of Biology

#22 ***Correlation of Pincer Size with Dominance in Crayfish***
Camille Boudreaux, Breanna Durbin, Teddy Huerta, Taylor Maitland
Faculty Sponsor: Carolyn Jaslow, Department of Biology

#23 ***Sweetener Preference of White Cabbage Butterflies***
Ben Carnes, Christine Corbett, Amelia Phelps, Bene' Woods
Faculty Sponsor: Carolyn Jaslow, Department of Biology

#24 ***Comparing Lichen Growth near Road Pollution***
Sanhitha Valasareddy, Caroline Clark, Sooji Hong, Aubrey Howard
Faculty Sponsor: Carolyn Jaslow, Department of Biology

#25 ***The Effects of Cheliped Length on Dominance in Crayfish***
Alexander Croft, Laura Lee Madigan, Brooke Tomlin, Adyita Biswas
Faculty Sponsor: Carolyn Jaslow, Department of Biology

#26 ***Food Preference of the Omnivorous Cricket (*****Acheta domesticus*****)***
Braden Taylor, Sarah Laves, Delaney Bracken, Rebecca Thompson
Faculty Sponsor: Carolyn Jaslow, Department of Biology

#27 ***The Role of Substrate Preference in Crayfish Intraspecific Agonistic Behavior***
Chase Crowell, Alison Hanson, Wyatt Pease, Di Briana Xu
Faculty Sponsor: Carolyn Jaslow, Department of Biology

#28 ***Do Different Concentrations of Salt Affect Bulk Flow of Flowering Plants?***
Abdul Amro, Joshua Wu, Kim Xiong
Faculty Sponsor: David Kabelik, Department of Biology

#29 ***Linear Correlation Between Dose of Gibberellic Acid and Consequential Increases in Length of Plant Stem***
Sebastian Atalla, John Raper, Juan Baiza, Drew Kerby
Faculty Sponsor: David Kabelik, Department of Biology

#30 ***The Differences in the Stomatal Density and Aperture Size on the Abaxial Surface of Leaves at Various Heights on a Hybrid Between*** **Rosa Glauca** ***and*** **Rosa Rubiginosa**
Matthew Cannavo, Megan LaBarreare, Sarah Malkowski, Addison Jezek
Faculty Sponsor: David Kabelik, Department of Biology

#31 ***Can Lichenometry Accurately Predict the Relative Age of Buildings on Rhodes Campus?***
Perri Carroll, Laura Hales, Shannon Feamester, Stephanie Kaspar
Faculty Sponsor: David Kabelik, Department of Biology

#32 ***The Stomata Density of Various Tree Leaves on Different Locations of the Trees***
Jingwen Chen, Patricia Pyda, Ning Nie, Courtney Whittle
Faculty Sponsor: David Kabelik, Department of Biology

#33 ***The Presence of Bisphenol-A Effects Growth and Development in Plants***
Joe McPeak, Richard McGuire, Kaitlin Andrews
Faculty Sponsor: David Kabelik, Department of Biology

#34 ***Leaves Found on Higher Level of Elevation on Trees Would Have a Higher Stomata Density***
Catherine Sullivan, Jason Crutcher, Nick James, Alyaa Altabbaa
Faculty Sponsor: Lynda Miller, Department of Biology

#35 ***There is a Significant Difference in the Trill Frequency of Cricket Chirp with Varying Temperature***
Donya Ahmadian, Colin Chu, Gracie Gilbert, Erik Klingbeil
Faculty Sponsor: Lynda Miller, Department of Biology

#36 ***Lichen Growth Distribution on Forest Trees***
James Simpson, Elizabeth Walker, Amanda Wright, Annika Wuerfel
Faculty Sponsor: Lynda Miller, Department of Biology

#37 ***Effects of Direct Sunlight on Lichen Growth***
Katherine Flynt, Jacob Powers, Leah Joyner Morgan Cantor
Faculty Sponsor: Lynda Miller, Department of Biology

#38 ***Increased Caffeine and Increased Melatonin Levels Independently Affect Aggression Between Two Male Crayfish***
Shelley Choudhury, Michael Davidson, Alvaz Kaukab, Shelby Scott, Sierra Thompson
Faculty Sponsor: Lynda Miller, Department of Biology

#39 ***Effect of Light and Dark on Leaf Stomata***
John Lacheta, Jessica Baker, Aaron Vancil, Alexandra Elliott
Faculty Sponsor: Lynda Miller, Department of Biology

Natural Sciences

#41 ***Characterizing the Molecular Interaction Between the Malaria Parasite and Human Red Blood Cells***
Madeline Jeansonne, Anahita Rahimi-Saber
Faculty Sponsor: Laura Luque de Johnson, Department of Biology
Malaria kills over 500 0000 people worldwide each year. Plasmodium spp, malaria's casual agent, invades human red blood cells (RBCs), resulting in the disease's clinical symptoms. The morphological events during RBC invasion are characterized, but the molecular mechanism of RBC invasion is unknown. To characterize this mechanism, we generated a recombinant plasmodium protein the Erythocyte Binding Antigen 175 (EBA-175). EBA-175 binds to Glycophorin A (GAP) on the

surface of RBCs, initiating invasion. We hypothesize that this binding causes RBC cytoskeletal rearrangement. To test this, we performed a RBC binding assay with human blood to show the functionality and specificity of EBA-175. We then used a confocal microscope to visualize the location of a RBC cytoskeletal protein, ankyrin, before and after binding with EBA-175. The recombinant protein is functional because it binds to human RBCs, and this binding leads to a rearrangement of the ankyrin protein. Next steps include determinining the cellular signaling pathway involved in ankryin's rearrangement. Characterizing the parasite's molecular mechanism of RBC invasion can lead to the identification of potential drug targets and perhaps better treatment for malaria.

#42 ***Snake Parasites in Overton Park***

Alex Yu, Amanda Sandifer, Matthew McCravy, Adiha Khan, John Grisham, Jon Davis, Sarah Boyle, Laura Luque de Johnson

Faculty Sponsor: Laura Luque de Johnson, Department of Biology

Snakes are mid trophic level feeders and are thoroughly integrated into their ecosystem. As mid trophic feeders, snakes often serve as reservoirs for multiple parasites. However, little is known about the effects these parasites have on the overall health and fitness of the snake. To better understand the effects of snake parasitism we are investigating the prevalence and mode of infection of hemoparasites in snakes at Overton Park. Blood samples were taken from collected snakes. Microscopy was used to determine the presence and load of hemoparasites. To identify the genus and species of the hemoparasite, the DNA was extracted from the blood samples and the 18S ribosomal gene was amplified. Molecular analysis revealed that the hemoparasite is of the genus Hepatozoon with the species undetermined. Microscopy analysis of the parasite revealed that they tend to enlarge the erythrocytes they occupy and contained several morphological differences compared to previously documented species. To determine the mode of transmission, potential vectors were collected and subjected to DNA analysis. This study has taken the first step in characterizing an unidentified hemoparastie. Further characterization of its life cycle will allow us to understand the role it might play in the overall health of snakes.

#43 ***Effects of Traumatic Lumbar Puncture on Molecular Detection of Herpes Simplex Virus Encephalitis (HSVE)***

Rebecca Thompson, I. Pareek, C. House, Methodist LeBonheur Children's Hospital; K.A. Ramirez, University of Tennessee, Methodist LeBonheur Children's Hospital, Department of Infectious Diseases, St. Jude Children's Research Hospital, Children's Foundation Research Center

Faculty Sponsor: Gary Lindquester, Department of Biology

The detection of HSV DNA in the cerebrospinal fluid (CSF) by PCR is the gold standard for diagnosing HSVE, which can produce very small quantities of DNA. Therefore, PCR detection must be extremely sensitive. Amplification can be inhibited by contaminants present in blood (ie hemoglobin). Traumatic lumbar punctures occur frequently and are defined as >400 RBC/mm3 (visibly pink tinged). Newer molecular diagnostic techniques (ie improved extraction capabilities) may reduce PCR inhibition by blood products. Clinically applicable reductions of sensitivity by blood products on real-time PCR have not been evaluated. We studied the experimental effects of various concentrations of human blood on the semi-quantitative detection of HSV-1 in human CSF. No blood concentration significantly affected PCR when compared to control (CSF+HSV without blood) [Mean CT*: 31.85 (SD1.83)], p all >0.05. Advanced DNA molecular extraction and sample processing techniques appear to overcome the previously observed PCR inhibition allowing sensitive detection of HSV encephalitis despite traumatic lumbar puncture.

#44 ***Investigating the Involvement of Dopamine in Courtship and Aggression in Brown Anole Lizards***

Aaron Kala, Veronica Alix, Madeline Scott

Faculty Sponsor: David Kabelik, Department of Biology

Presently, the relationship between vertebrate behaviors and brain states is poorly understood as most brain regions are often involved in multiple behavioral processes in addition to homeostatic regulation and other physiological operations. Further, the activation of a single brain region does not necessitate specific behavioral changes, as behaviors are believed to be the result of a conglomeration of multiple neural networks functioning conjointly. In order to gain a better understanding of the behavior-brain state relationship, a detailed map of behaviorally relevant neural activation throughout the brain is necessary. Here, the neural activity involved with aggression and courtship in brain regions in Brown Anole (Anolis sagrei) lizards was examined using Fos immunocytochemistry. Fos levels were measured in relation to the involvement of the neurotransmitter dopamine in specific neural populations. Fos/dopamine colocalization did not vary significantly with type of social interaction; however, such relationships are being investigated further. Correlations between neural activation and behavior were also observed. We hope to explore additional brain regions in the future in order to continue assembling a model of a social behavior neural network.

#45 ***Identifying proteins potentially causal to development of autism-related antibodies in children with familial autoimmune history***

Ashley Ladd, Lawrence Reiter, Kathryn McVicar, Laura Jensen
Faculty Sponsor: David Kabelik, Department of Biology

Past research reveals many identifying factors contributing to autism, including environmental, molecular, and genetic factors that play a role in this disorder. Factors such as autoimmunity, maternal auto-antibodies, protein-specific serum reactivity all show a correlation with autism symptomology and prevalence. As this research expands; however, it remains difficult to target specific factors that are useful for treatment purposes. The current study focuses on the specific serum antibodies against proteins involved in children with autism with and without the influence of familial autoimmune history (FAH). Our hypothesis is that development of serum IgG antibodies against human proteins is the underlying molecular incident leading to autism in a subset of individuals with autism plus FAH. Using protein array analysis with human serum in four autism +/- FAH samples, 43 proteins were detected as being more prevalent in autism with FAH than without FAH. Verification and expansion of these proteins are necessary to provide clinical implications. With further data, this research direction yields potential for the creation of a protein assay specific to the proteins identified. This could be used clinically as an early biomarker for autism and could also allow classification of etiologies of this sub-type of autism.

#46 ***Vasotocinergic Activity Varies with Social Context in the Brown Anole (Anolis sagrei) Lizard***

Salar Rafieetary, Megan O'Brien, Piper Carroll
Faculty Sponsor: David Kabelik, Department of Biology

In any vertebrate species, structure-function relationships between the brain and social behaviors are poorly understood because individual nodes within the neural network do not simply regulate one type of social behavior. Instead, social behaviors are modulated by a number of different nodes, most of which converge at various locations to induce different behavioral outputs. In this study, we aimed to attain a better understanding of the activity of various neural nodes within the vasotocinergic circuitry and how they relate to social interactions (aggression and courtship behaviors) in Brown Anole (Anolis sagrei) lizards. We measured neural activity using Fos immunohistochemistry and found that the activity of various nodes differed as a function of different social interactions. Further analysis indicated that within a specific social interaction, a correlation exists between level of neural activity and level of displayed behavior. By extending this research to other nodes and across other neuropeptide circuitries, we hope to create a model for social behavior within the brain of this vertebrate species.

#53 ***MP2 Calculations of Interaction Energies Between Acetaminophen and Acetaminophen Analogues and Aryl Sulfotransferase***

Katherine DiGiovanni
Faculty Sponsor: Mauricio Cafiero, Department of Chemistry

Acetaminophen is a commonly used analgesic. Cresols such as p-cresol, o-cresol, and m-cresol can compete with acetaminophen for metabolism. We have applied MP2 and DFT methods to study the interaction of acetaminophen and these cresol analogues with the active site of aryl sulfotransferase, which is involved in the sulfation-pathway of acetaminophen metabolism. Docking and BHandHLYP optimization were used to find the structures of the ligand-protein complexes assuming a static active site. Interaction energies between the ligands and each of the amino acids in the active site were calculated with MP2 and SVWN/6-311+g*. Optimizations were performed to allow flexibility of the amino-acid-residues in the active site and interaction energies were calculated for these complexes as well. We can thus offer predictions as to how competitive the cresol analogues are with acetaminophen for metabolism. In recent work we have studied mutant versions of the active site with p-nitrophenol and dopamine to determine the change in ligand-binding.

#54 ***MP2 and DFT studies of potential non-competitive inhibition of HMG-CoA reductase: complementing statin drugs***

Rachel Sanders, Allison Price
Faculty Sponsor: Mauricio Cafiero, Department of Chemistry

Statin drugs moderate blood cholesterol levels by acting as competitive inhibitors for 3-hydroxy-3-methyglutaryl-coenzyme-A (HMG-CoA) reductase, blocking the biosynthesis of cholesterol early in the synthesis pathway In previous work (J. Phys. Chem. B, 113, 14810, 2009) it has been shown that the residue Tyr479 in the active site of HMG-CoA reductase exerts a strong attraction on ligands. Other work in our group has shown that small molecules can be designed that span and bind strongly to the entire active site, including Tyr479 (Computational and Theoretical Chemistry, 967, 171, 2011). In this work, we investigate the binding of small molecule inhibitors to an allosteric site in HMG-CoA reductase that also contains Tyr479. We believe that binding to this allosteric site may disrupt the shape of the primary active site, further disrupting the synthesis of cholesterol. Interaction energies between the small molecule ligands and the target enzyme active site are calculated with all-electron correlated methods such as MP2 and DFT. Initial results show strong interactions for ligands in this site.

#55 ***The effects of DNA back-bone charge and solvent on intercalant/DNA interactions***
Ashley Tufton
Faculty Sponsor: Mauricio Cafiero, Department of Chemistry
Intercalant molecules are aromatic molecules that bind between nucleic-acid bases in DNA. The presence of the intercalant disrupts the DNA structure, interfering with replication. In this work, we examine the interaction energies between a model intercalant (indole) and segments of DNA. Differences in interaction energy, with respect to the particular base pairs binding the intercalant, provide information about the most likely locations for intercalants to bind to DNA. The six complexes of four DNA bases (AT..TA,GC..CG, etc), each with the intercalant bound in between, were optimized (gas-phase and solvent) using ONIOM(DFT/3-21G:AM1) with the DNA bases and intercalant in the upper-level and the sugar-phosphate back-bone in the lower-level. All interaction energies in the systems were calculated with MP2 and DFT with the 6-31+G* basis set. All complexes were examined with and without charge on the phosphate groups. The results show trends for the intercalant's preferred binding location and the effect of charge on binding.

St. Jude Summer Plus Fellowship

#47 ***Radiation Treatment for Medulloblastoma Survivors Disrupts Normal Reading Acquisition***
Evan Savage, Rhodes College; Robert Ogg, Department of Radiological Sciences, St. Jude Children's Research Hospital
Faculty Sponsor: Kim Gerecke, Department of Psychology
We used fMRI to examine the relationship between acquired reading deficits and therapy-induced brain injury in the extrastriate visual areas of the occipital and temporal lobes of medulloblastoma survivors. The first task we used probed subjects reading acquisition through presentation of a series of words and false-font strings in an implicit reading paradigm; we expected survivors to have longer reaction times during this task when compared to controls. During the task, survivors showed significantly longer reaction times compared to controls when choosing if words or false-font symbols contained ascenders (like l, f, or t). Also, survivors showed significantly lower scores during word recall when given a post-test. The second task examined orthological processing through presentation of letters or false-font symbols and phonological processing through presentation of letter-sounds; again, we expected survivors to show longer reaction times during this task. Survivors showed significantly longer reaction times when determining if letter-pairs were visually the same (like t and t) and when determining whether letter-pairs rhymed (like B and E). Our overall findings suggest differences between controls and survivors in implicit reading performance, and in orthological and phonological performance. This suggests that reading skill acquisition may be reduced in medulloblastoma survivors.

#48 ***Proliferation Study of the Subventricular Zones in GFAP::Cre;SmoM2[fl/+] Mice Brains***
Zongyu Yang, Rhodes College; Young-Goo Han, Shirui Hou, Department of Developmental Neurobiology, St. Jude Children's Research Hospital
Faculty Sponsor: Loretta Jackson-Hayes, Department of Chemistry
The hedgehog (Hh) signaling pathway plays a key role in regulating animal development and is present in all bilaterians. Hh genes have been found in a range of invertebrates as well as vertebrates including mouse and human. The Hh signaling pathway controls many aspects of animal development including brain development. 2 Germline mutations in Hh pathway proteins are associated with developmental disorders, whereas hyperactivation of Hh signaling in human leads to medulloblastoma, the most common malignant brain tumor in children. Constitently, GFAP::Cre; SmoM2[fl/+] mice that expresses a constitutively active mutant form of Smoothened(SmoM2), a master activator of intracellular Hh signaling cascade, develop medulloblastoma but does not develop tumor in the cerebrum. Interestingly, however, these mice show greatly expanded subventricular zones(SVZ), the proliferative zone in the cerebrum, but the SVZ stopped thickening by P2. In the study, mice embryos were introduced with chemicals that incorporated into proliferating cells(Cldu, Edu) at various time point during embryonic and early postnatal development to determine exactly when the progenitor cells in the SVZ start and stop abnormal proliferation.. This study may be able to shed light on why hyperactivation of this signaling does not directly cause brain cancer other than medulloblastoma.

#49 ***Molecular Mechanisms that Influence T Cell Survival***

Anna Kushnir, Rhodes College; Blaine Creasy, Tarsha Harris, Maureen McGargill, Department of Immunology, St. Jude Children's Research Hospital

Faculty Sponsor: Gary Lindquester, Department of Biology

Drak2 is a serine/threonine kinase expressed primarily in B and T cells. We have previously shown that Drak2-/- mice are resistant to type 1 diabetes and multiple sclerosis due to a defect in the survival of autoreactive T cells that lack Drak2. However, Drak2-/- T cells are able to eliminate pathogens, similar to wild type (WT) T cells. Therefore, Drak2 could be a potential therapeutic target to treat autoimmune diseases without compromising immunity to infectious pathogens. In this study, we investigated the mechanism in which Drak2 affects T cell survival. Here we show Drak2 is specifically required for the survival of T cells undergoing proliferation. Utilizing confocal microscopy, we found morphological differences between WT and Drak2-/- activated T cells, suggesting a defect in the ability of Drak2-/- T cells to undergo cell division. In addition, Drak2-/- cells demonstrated defects in metabolism when compared to WT T cells. We also performed immunoprecipitation and mass spectrometry to identify Drak2-interacting proteins, and identified proteins involved in cell cycle progression and metabolic pathways. These results suggest Drak2 is important for progression through cell cycle, and in its absence, proliferating T cells do not survive, which prevents autoreactive T cells from accumulating and causing disease.

#50 ***MicroRNA Alteration of Transcriptional Activity By Gene Promoter Interaction As Monitored By Gold Nanoparticle Aggregation***

Lucas Laudermilk, Rhodes College; Steven W. Paugh, William E. Evans, Department of Pharmaceutical Sciences and Hematological Malignancies Program, St. Jude Children's Research Hospital

Faculty Sponsor: Gary Lindquester, Department of Biology

Recent research suggests that, in addition to interfering with translation and degrading mRNAs, microRNAs may play a role in up-regulating mRNA transcript levels. Two broad categories by which microRNAs down-regulate gene transcript levels have been characterized: direct and indirect. MicroRNAs can either directly interact with mRNAs to down-regulate them, or they can act upon co-factors that down regulate the efficiency of translation. MicroRNAs have also been shown to indirectly up-regulate genes by acting on cofactors that would typically suppress transcription. What has not been characterized is a direct mechanism by which microRNAs up-regulate gene transcripts. Correlations between microRNAs and mRNAs were performed using genome-wide analyses of RNA from pediatric acute lymphoblastic leukemia cells. Another screen involves studying the complementarity between microRNAs and their potential binding sites within gene promoter regions according to the motif of Reverse-Hoogsteen triplex pairings. Interactions of interest are characterized by a combination of high complementarity in target site binding and a positive, significant correlation between the particular microRNA and the particular mRNA associated with the relevant gene promoter. This study is designed to test the hypothesis that microRNAs up-regulate transcription levels by binding to double-stranded DNA to form triplexes at target sites within gene promoter regions.

#51 ***Identifying the role of components of the SHREC complex in the assembly of centromeric heterochromatin in fission yeast***

Wenbin Du, Rhodes College; Janet Partridge, Department of Biochemistry, St. Jude Children's Research Hospital

Faculty Sponsor: Mary Miller, Department of Biology

The fission yeast Schizosaccharomyces pombe contains large blocks of heterochromatin, and shows conservation of many factors that affect heterochromatin assembly. Heterochromatin not only silences transcription of underlying DNA sequences but also prohibits recombination, which is essential for protecting genome integrity. A multienzyme effector complex (termed SHREC) is the homolog of the Mi2/NuRD remodeling complex that constitutes an enzymatic component of a pathway for assembly and maturation of chromatin; it mediates heterochromatic transcriptional gene silencing in fission yeast. SHREC consists of 5 proteins-Clr1, Clr2, Clr3, Mit1 and Chp2-which distribute throughout all major heterochromatin domains to effect TGS. Two components of the complex have enzymatic activity- Clr3 is a histone deacetylase, and Mit1 is an ATPase with similarity to ATP-dependent helicases involved in chromatin remodeling (Mi2). We know very little about the Clr2 component of the complex and whether it performs roles similar to the MTA (Metastasis tumor antigen) components of NuRD. Here we present functional assays to address the role of Clr2 in heterochromatin assembly.

Index