



April 27th Events

- Awards Convocation: 9:00 a.m., McNeill Concert Hall in West Campus
- Poster Session I & Lunch Reception, 11:30 a.m.-1:30 p.m., Multi-Sports Forum of the Bryan Campus Life Center
- Oral Presentation Sessions: 11:00-5:00 p.m., various locations
- Poster Session II & Closing Reception: 4:00-6:00 p.m., Multi-Sports Forum of the Bryan Campus Life Center

Acknowledgements and Special Thanks

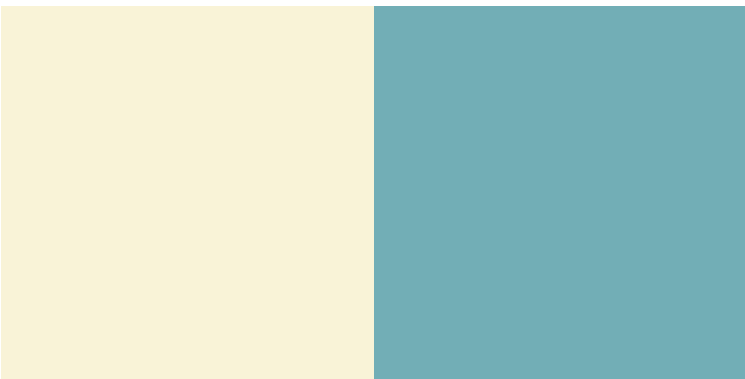
- Communications, URCAS program cover design and online abstract submissions
- Leah Ford, Office of Academic Affairs, Preparation of the URCAS program
- Catherine Weddig and Meaghan Pickles, Rhodes Student Associates for Fellowships, App curators

URCAS Planning Committee

- Mauricio Cafiero, Chair, Department of Chemistry, James H. Daughdrill Professor of Natural Science, and Special Assistant to the Dean
- Dana Horgen, Assistant Professor, Department of Chemistry
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undergraduate research & creative activity symposium

friday, april 27

schedule by building

Poster Sessions will be held in the Multi-sports Forum of the BCLC
11:30 AM-1:30 PM & 4:00-6:00 PM

BUILDING	TIME	ROOM	SESSION TITLE
buckman hall	11:00-12:30	buckman 200	rhodes historical review
buckman hall	1:30-3:00	buckman 200	research in political science
buckman hall	2:30-3:30	buckman 108	empirical economics i
buckman hall	4:00-5:00	buckman 108	empirical economics ii
clough hall	1:00-2:15	clough 302	developmental science & the legacy of martin luther king: advocating for the civil rights of children i
clough hall	1:15-2:45	clough 204	anthropology & ethnography i
clough hall	2:00-3:00	clough 417	studies of the past & present
clough hall	2:20-3:35	clough 302	developmental science & the legacy of martin luther king: advocating for the civil rights of children ii
clough hall	3:00-4:15	clough 204	anthropology & ethnography ii
clough hall	3:00-5:00	clough 312	fresh: a performance art showcase
clough hall	3:40-4:55	clough 302	developmental science & the legacy of martin luther king: advocating for the civil rights of adolescents
clough hall	4:00-5:00	clough 417	interdisciplinary topics ii
clough hall	4:00-5:00	clough-hanson gallery	studio art senior thesis exhibition: enter through the window
frazier-jelke	1:30-2:00	fj-a	quantitative & computational science i
frazier-jelke	1:30-2:15	fj-d	the natural world ii
frazier-jelke	1:30-2:15	fj-c	the physical world i
frazier-jelke	2:30-3:15	fj-a	quantitative & computational science ii
frazier-jelke	2:30-3:15	fj-d	the natural world iv
frazier-jelke	2:30-3:00	fj-c	the physical world ii
frazier-jelke	3:30-4:15	fj-a	quantitative & computational science iii
frazier-jelke	3:30-4:00	fj-d	the natural world vi

undergraduate research &
creative activity symposium
friday, april 27
schedule by building

BUILDING	TIME	ROOM	SESSION TITLE
hassell hall	12:30-1:30	hassell 100	VIOLET: gritty, deconstructed nostalgia in the year of mlk50
hassell hall	1:30-2:30	tuthill performance hall	the cauthen competition: final round
hassell hall	2:30-3:00	tuthill performance hall	concert of nats student competitors
kennedy hall	2:15-3:30	kennedy 205	interdisciplinary topics i
palmer hall	1:30-2:15	palmer 207	cultural encounters
palmer hall	1:30-2:15	palmer 210	asian historical studies
palmer hall	2:15-3:15	language center	spanish senior seminar i
palmer hall	2:30-3:15	palmer 210	life of the text
palmer hall	3:30-4:30	palmer 210	regional histories
palmer hall	3:30-4:30	language center	spanish senior seminar ii
robertson hall	1:30-2:15	robertson 110	the natural world i
robertson hall	2:30-3:15	robertson 110	the natural world iii
robertson hall	3:30-4:15	robertson 110	the natural world v

SOCIAL SCIENCE ORAL SESSIONS

Anthropology & Ethnography I

1:15-2:45 pm

Clough 204

Moderator: Eric Kemp

1:15-1:30 pm Being "Inked": The Personal Meanings of Body Modification

Amelia Tornatore

Faculty Sponsor: Susan Kus, Department of Anthropology & Sociology

Tattoos and piercings may seem mundane or unnecessary to some, but to others they can mean something much more significant. This ethnography of Inked Memphis will be a look into the larger "body-mod" culture through the lens of a local shop; as well as a study of the studio's unique location and environment. Ethnography is the study of a specific culture or sub-culture through participant observation and expert interviews. I spent many hours at Inked Memphis watching, listening, and discussing tattoos and other body modifications (from both the artist/service side and from clientele of the shop), learning what body modification means to many and what these individuals are trying to tell us with their bodies.

1:30-1:45 pm Memphis Zoo

Tommy Dick 5 (i)12 (m)11.433 (y)-0.958 ()-1p433 (y)-0.T8pZ,m



Martin Music, located on Poplar Street in Memphis, Tennessee. For four months, I spent an hour and a half a week there, over time acquainting myself with the many employees, patrons, amps, pedals, ukuleles, and, of course, guitars, quite well. I learned that the people there express an inordinate amount of passion for music, inviting anyone to come in, talk and play, let alone buy anything. Through participant research and numerous conversations, my ethnography, a report on my experiences, draws upon my conversations and interviews regarding music and guitars as hobby, art, and lifestyle with customers and employees alike.

2:30-2:45 pm Conceptualizing the Bicycle as a Vehicle for Education and Social Change: An Ethnography of Revolutions Bicycle Cooperative

Bridget Blair

Faculty Sponsor: Susan Kus, Department of Anthropology & Sociology

Revolutions Bicycle Cooperative, located in the basement of First Congregational Church in Memphis, Tennessee, is a communal workshop space utilizing the bicycle as a tool for education, community engagement, and social change. For three months, I conducted an ethnographic study within Revolutions in an effort to better understand how a communal space structured around the bicycle informs the social interactions of its members. The ethnographic method employs participant observation and informal interviews as a means to understanding and attentively documenting a cultural scene. While positioned as a member of the cooperative, I was able to improve my technical cycling and bicycle maintenance abilities, but I was also able to observe the ways in which the cooperative offered a space for community conversation, encouraging the development of both physical and social awareness of the self within society. The ethnographic method provided an immersive approach to understanding the cultural scene at Revolutions Bicycle Cooperative, emphasizing the potential power of ethnography to both document and invite cross-cultural experiences.

3:45-4:00 pm Cymbal-ism

Josh Lucas

Faculty Sponsor: Susan Kus, Department of Anthropology & Sociology

Drums can be made of anything from a plastic bucket to a stretched cowhide. They exist across nearly all cultures and have been around for hundreds of thousands of years. To many different peoples, they represent different things, and this research has given me a unique opportunity to experience some of those things. Memphis Drum Shop's worldwide shipping, diverse inventory, and history of working with world-renowned drummers have made it the center of the drumming culture. Conducting an ethnography of the shop has given me an opportunity to experience the unique culture of shops around the world through the lens of this specific shop itself. The main intent of my research has been to appreciate and better understand the ethnographic method, and an observational study has helped me do that.

4:00-4:15 pm A Closer Look at Shangri-La Records

Grace Cloar

Faculty Sponsor: Susan Kus, Department of Anthropology & Sociology

Shangri-La Records is a place where the senses are always engaged. Whether you're getting lost in the music that is playing throughout the store, flipping through the many different genres of vinyl, or simply looking around at the eclectic assortment of art, posters, and signs that cover every inch of the store. Shangri-La is a local record store located in Midtown, Memphis, and I have learned that they do much more than just sell records. Throughout the semester, I have been conducting an ethnographic study of Shangri-La in order to gain a more holistic perspective of the site. The ethnographic method has allowed for me to immerse myself in the cultural scene of the store through participant observation. I have questioned my assumptions, stepped outside of my comfort zone, and developed an appreciation for the unexpected. I hope to learn more about who interacts with the space, how, and why. Especially in the digital age of streaming music.

Interdisciplinary Topics I

2:15-3:30 pm

Kennedy 205

Moderator: Keyshawn Butts

2:15-2:30 pm Social Class and Occupation Associations Moderated by Race

Katrina Cymerman

Faculty Sponsor: Matthew Weeks, Department of Psychology

Previous research found support for the notion that people associate occupations with specific social classes. This study is specifically looking into the combination of race and gender and their effects on participants' social class associations. Our previous study found that participants systematically associated black males with lower SES occupations than the white male targets, even when the targets are described in the same way. In our study, we provided participants with



Empirical Economics I

2:30-3:30 pm

Buckman 108

Moderator: Erin Kaplan, Department of Economics

2:30-2:45 pm Do Insurance Premium Surcharges for Tobacco Use Encourage Smoking Cessation?

Christian Allen and Cameron Kaplan, University of Tennessee Health Science Center

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3:15-3:30 pm

characteristics such as bedrooms, bathrooms, age, and condition, I control for neighborhood walkability and school quality. I expect that, holding other home and neighborhood characteristics constant, houses in closer proximity to Overton Park will have higher sales prices, reflecting household preferences for amenities located in Overton Park.

4:30-4:45 pm Exogenous Shocks to Family Size and Probability of Divorce

Zoe Laulederkind

Faculty Sponsor: Jaqueline Oliveira, Department of Economics

This paper investigates the association between fertility and marital instability. By studying number of children in the context of an exogenous shock to family size, such as first-born twins, I identify negative bias resulting from the correlation between number of children and unobserved family planning in predicting divorce. I find evidence that controlling for demographic variables and then instrumenting number of children with instances of first-born twins reveals number of children to be statistically insignificant in predicting divorce as opposed to other related findings. To further investigate the nature of the exogenous shock, I analyze the effect of the sex of first-born twin pairs in the context of an instrument for sex of the first-born child in predicting probability of divorce. The findings suggest a negative bias resulting from female first-born twins being counted as one single female first-born child. My research suggests children might not play as large a role in keeping their parents together as the common American phrase “staying together for the kids” implies.

4:45-5:00 pm Estimating the Impact of Poverty on the Development of Mental Illness

Ashley Peterson

Faculty Sponsor: Jaqueline Oliveira, Department of Economics

Studies on the SES-mental health relationship have shown a negative causal relationship and have begun to investigate the causal mechanisms. I intend to add to this existing body of research by evaluating the impact of psychoeconomic factors (associated with poverty and economic hardship) on the development of mental health disorders. My findings indicate that there is a robust causal connection between low socio-economic status and anxiety and depression.

Research in Political Science

1:30-3:00 pm

Buckman 200

Moderator: Ried Roshong

1:30-1:45 pm Confronting the Court: The Supreme Court, the Confrontation Clause, and the Ways They Interact

Daniel Elliott

Faculty Sponsor: Renée Johnson, Department of Political Science

The Confrontation Clause, a collection of eighteen words contained within the Sixth Amendment, protects the right of the criminally accused to “be confronted with the witnesses against” him or her. Yet, as decades of Supreme Court litigation have sought to redefine this right, the meaning of the Confrontation Clause has changed noticeably. This paper seeks to determine what reasons may underlie the Supreme Court’s decisions in Confrontation Clause litigation. By examining data collected from Supreme Court cases between 1953 and 1997 that deal with Confrontation, this paper uncovers the ideological tone of the lower court’s opinion as one possible predictor of judicial decision-making of the Supreme Court.

1:45-2:00 pmA Measured Approach to the Deat-3.958 (t-3.958 (t-331R222 (e)3.15(o)-0.958 (958 (e)3.

2:15-2:30 pm

2:45-3:00 pm Supreme Court Legitimacy: What variables influence the public's trust in the Court?

Sarah Ryan

Faculty Sponsor: Renée Johnson, Department of Political Science

The highly politicized confirmation of Justice Neil Gorsuch to the Supreme Court made the question of Supreme Court legitimacy resurface as one of public interest. Court legitimacy explains how the public understands and trusts that the Court's rulings are based on and justified by the law of the land. The purpose of this study is to explore what factors are related to or might influence the public's trust in the Supreme Court. This analysis uses data from Wave One of the 2005 'Citizen, Involvement, Democracy' Survey to run frequency distributions, cross-tabulations, and linear regressions that test the relationships between and effects of several factors on the variable 'Trust in the Court.' Careful analysis revealed that the variables 'Race,' 'Ideology,' and 'Opinion of Politics in the Court' have a statistically significant effect on the value of the dependent variable. This analysis has made good progress in understanding what factors might influence the public's trust in the U.S. Supreme Court, and also interestingly challenges many of the variables that other studies have found to be significant. Such studies display the continuing importance of the public's relationship with the Court and perception of it as a legitimate institution.

Developmental Science and the Legacy of Martin Luther King: Advocating for the Civil Rights of Children I

1:00-2:15 pm

Clough 302

Moderator: Marsha Walton, Department of Psychology

Throughout this semester, the city of Memphis has been commemorating the 50th Anniversary

1:25-1:35 pm The Promise of Media for Securing Martin Luther King's Dream of Multicultural Understanding

Lauren Hakim, Emily Pierce, and Mary Gunning

Faculty Sponsor: Marsha Walton, Department of Psychology

Article 17 of the UNCRC asserts that every child should have access to media without discrimination, especially media that pertains to the promotion of his or her well-being and



2:45-2:55 pm The Child's Right to Media Access: Educational Media and Technologies in Elementary Schools

Emma Hauck, Ericka James, and Abigail Smack

Faculty Sponsor: Marsha Walton, Department of Psychology

inadequate for children with disabilities. We propose that technology can be the promise of equitable educational experiences in the classroom. We describe two research practices related to each

responsibility for decision making in their custody cases. We argue that the civil rights of adolescents are best secured when their voices are seriously considered, but when custody decisions are finally made by trained professionals charged with determining their best interests.

FINE ARTS ORAL SESSIONS

Violet: Gritty, Deconstructed Nostalgia in the Year of MLK50

12:30-1:30 pm

Hassell 100

Moderator: Montana Pugh

Violet: Gritty, Deconstructed Nostalgia in the Year of MLK50

Karissa Coady, Jenny Wilson, Emily Murphy, Andrea Pajarillo, Montana Pugh, and Sophia Deck

Faculty Sponsor: Michelle Mattson, Associate Dean of Academic Affairs

Violet: A Musical, a product of a Theatre senior seminar project, is a student-driven collaboration between Rhodes College and The University of Memphis. Violet, our protagonist, experiences internal and external battles as she is exposed to the complexities of the civil rights movement, religion, and the Vietnam War on her journey through the American South. Our production concept for Violet embodies nostalgic realism-- returning to the world of Vietnam-era America, we shift the scope of focus from glorified coasts of the country to “honest-to-God” Middle America. In an effort to maintain a grounded, humanizing element in this musical, we are concerned with preserving the reality of the lives that Violet presents on stage; we are approaching this element in a way that reflects the true nature of this show-- grit. Our production closes just shy of the 50th anniversary of Dr. Martin Luther King’s assassination; a half-century later, we are still facing an extreme amount of racial and religious tension. Memphis is a city that embraces its past in looking toward the future. Through our production concept of “gritty, deconstructed nostalgia,” we hope to inspire dialogues and action outside of the ones we will grapple with inside the rehearsal hall.

Cauthen Competition

1:30-2:30 pm

Tuthill Performance Hall

Moderator: Bill Skoog, Department of Music

The Cauthen Competition: Final Round

Faculty Sponsor: Bill Skoog, Department of Music

Gladys Cauthen was one of the founding influences in the development of the Rhodes College Department of Music, which grew out of the Memphis College of Music. In her honor and

memory, Gladys Cauthen's legacy is remembered through the naming of this solo competition. The winner will perform with the Rhodes College Orchestra in the following academic year.

National Association of Teachers of Singing

2:30-3:00 pm

Tuthill Performance Hall

Moderator: Carole Blankenship, Department of Music

Concert of NATS Student Competitors

Kathryn Brode, Isabel Celata, Cameron Crawford, Raneem Imam, Hannah Oakley, Grace Tomeny, and Camila Zimmerman

Faculty Sponsor: Carole Blankenship and Tom Bryant, Department of Music

Singing competitions sponsored by the National Association of Teachers of Singing are held yearly. For Rhodes voice students that competition occurs in the Mid-South Region of NATS and encompasses schools and voice studios in Kentucky and Tennessee. This April seven students from Rhodes traveled to Northern Kentucky University to participate in that regional audition with the opportunity to advance to the national semi-final level. The students competed in classical and music theatre auditions. For the URCAS presentation each student who

Graduating senior studio art majors discuss their individual research, processes, and resulting artwork, which is currently on display in Clough-Hanson Gallery as part of the Senior Thesis Exhibition.

SCIENCE ORAL SESSIONS

Quantitative and Computational Science I

1:30-2:00 pm

FJ-A

Moderator: Austin Barringer

1:30-1:45 pm Crave It: A Food Delivery Solution for Gated Campus Communities

Avery Blankenship, Michelle Ngo, and Alex Stickler

Faculty Sponsor: Betsy Sanders, Department of Mathematics & Computer Science

CraveIt is a mobile application that provides residents of gated campus communities with a more

Quantitative and Computational Science II

2:30-3:15 pm

FJ-A

Moderator: TBD

2:30-2:45 pm Offloading Active Messages to Hardware in a Partitioned Global Logical Address Space

John Snyder and Brian Larkins, Department of Mathematics & Computer Science

Faculty Sponsor: Brian Larkins, Department of Mathematics & Computer Science

The use of accelerators in High Performance Computing has become popular due to their lower power consumption relative to CPUs. With the creation of new network architectures, the use of accelerators is becoming increasingly important. This paper presents a novel approach to offloading active messages to hardware in a partitioned global logical address space. The approach is based on the use of a hardware accelerator that can offload active messages to hardware in a partitioned global logical address space. The approach is based on the use of a hardware accelerator that can offload active messages to hardware in a partitioned global logical address space.



of the Laurent coefficients at $t_1 = 1$). Our results suggest that there do seem to be similar relations, indicating a possible generalization to this case. Beyond the scope of this project, the motivation for studying these relations is as follows. By a theorem of R. Stanley, a graded Cohen-Macaulay domain A , where a is the a -invariant, is Gorenstein if and only if its Hilbert series satisfies the functional equation given above.

4:00-4:15 pm Characterization of weight matrices that induce torus actions of different properties

Yi Song

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

Symplectic manifolds arise as geometrical representations of classical mechanical systems. We focus on the study of symplectic quotients, which are quotients of symplectic manifolds by symmetries of the system. The simplest quotients are by finite groups of symmetries and are known as orbifolds. However, it has been observed that more complicated symplectic quotients can sometimes but not always be identified with orbifolds. In fact, previous work by Herbig-Schwarz-Seaton has shown that if the group action of a torus on a complex space has certain properties, called 2-principal and stable, then there does not exist a symplectomorphism between the symplectic quotient and a linear symplectic orbifold. In another word, properties of the torus actions have implications on the connection between the symplectic quotients and orbifolds. My research focuses on characterizing the weight matrices that induce k -principal and stable torus actions. I will present progress towards determining such a characterization of the weight matrix.

catecholic compounds, highlighting the stability via HPLC analysis and the inhibition

The Natural World II

1:30-2:15 pm

FJ-D

Moderator: TBD

1:30-1:45 pm Ybx1 interacts with the PRC2 complex in early neural development

Jennifer Loomer and Jamy Peng, St. Jude Children's Research Hospital

Faculty Sponsor: Jamy Peng

The Polycomb Repressive Complex 2 (PRC2) epigenetically regulates gene expression during early embryonic development. PRC2 methylates histone 3 lysine 27 associated with its target genes, leading to chromatin compaction of the target genes. Its gene targeting is governed by JARID2, whose activities are poorly understood. Our studies of PRC2 and JARID2 led to the identification of a new binding protein, Y-box-binding protein 1 (YBX1). Here, we report our biochemical and genetic characterizations of Ybx1. Jarid2 null mice develop a distinctive exencephaly phenotype, indicating that its activity is essential for early development. Knockout of the gene Ybx1 yields a similar phenotype, suggesting a functional relationship between these genes. Here, we confirmed that JARID2 physically binds with YBX1 in human embryonic stem cells, mouse neural tube, and in vitro as recombinant proteins. We demonstrate that knockout of Ybx1 leads to overgrowth of mouse neural progenitor cells (NPCs), and gene expression profiling revealed that YBX1 null NPCs have altered expression of genes involved in forebrain development. We are characterizing the effect of Ybx1 over NPC differentiation. Our findings indicate that Ybx1 is essential to early mammalian neural development and suggest that Ybx1 regulates PRC2 activity.

1:45-2:00 pm Understanding RevCen mediated heterochromatin establishment in *S. pombe*

Patrick Smith, Abby Ellingwood, Yanai Almalem, and Bayly Wheeler, Department of Biology

Faculty Sponsor: Bayly Wheeler, Department of Biology

Eukaryotic genomes are packaged into two types of chromatin: euchromatin and heterochromatin. Formation of heterochromatin at a specialized locus, called the centromere, is important for the division of genetic information between two cells. In fission yeast, heterochromatin forms at repetitive DNA sequences, including RevCen, a short transcript found within all three centromeres. RevCen transcripts are processed by the RNAi pathway, which enables RevCen to establish heterochromatin. RevCen can recruit heterochromatin and silence gene expression when removed from the centromere, suggesting that RNAi machinery is targeted to RevCen by specific sequences. To identify sequences within RevCen that are important for heterochromatin establishment, we deleted an siRNA-producing domain from the RevCen transcript. Because this domain is perfectly conserved among all copies of RevCen, we predicted it would be important for heterochromatin establishment. However, we show that this deletion did not impact the ability of RevCen to silence gene expression. This finding suggests

The Natural World III

2:30-3:15 pm

Robertson 110

Moderator: Grace Kennedy

2:30-2:45 pm DFT Study of the Selectivity of DOPA-Decarboxylase

Emily Harrison and Abby Ritter; Laryn Peterson and Mauricio Cafiero, Department of Chemistry

Faculty Sponsor: Mauricio Cafiero, Department of Chemistry

~~2:30-2:45 pm DFT Study of the Selectivity of DOPA-Decarboxylase~~

underlying non-linearity in the efficiency of T cells. To further investigate the efficacy of the CD8+ T cell response and its role in virus resolution, we collected quantitative data using mice infected with Influenza A/PR8 and developed a kinetic model that quantifies the CD8+ T cell response and how it affects different phases of virus clearance. Our results indicate that the rate of virus-infected cell clearance by effector CD8+ T cells depends on the density of infected cells, and that the infection resolution is more sensitive to the effector T cell response robustness than to the rate of infected cell clearance. $t(f)2.367$ (e)3.158 , (e)3.158 (t)-2.542 (h)367 (T (e)3.158 ((p

The Natural World VI

3:30-4:00 pm

FJ-D

Moderator: TBD

3:30-3:45 pmA Quantitative Characterization of Amino Acid and Fatty Acid Metabolism in Cancer Cells

Zaid Ahmad

Faculty Sponsor: Erin Bodine, Department of Mathematics & Computer Science

Constraint Based Modeling is a biochemical modeling technique that has been used to analyze structural metabolic features of various organisms and cell types. Constraint based modeling uses Flux Balance Analysis, a linear mathematical procedure which determines the set of reaction fluxes to produce a maximum flux of a reaction of interest. In this project, a core cancer model developed by Zielinski et al. 2017 is constrained by a set of 59 cancer cell type uptake and secretion rates. Various objectives are maximized in order to determine the relative contribution of different reactions for certain cellular goals, including biomass, ATP, NADPH, cholesterol and amino acid production. Results indicate that the contribution of exogenous serine to internal serine consumption is highly variable across the 59 cell types while the contribution of Citrate Synthase and Aconitate Hydratase to cellular acetyl CoA production is more uniform and. The role of pyruvate dehydrogenase in biomass production is also assessed and compared to lactate dehydrogenase across different objective conditions.

3:45-4:00 pmSTAR Communities

Kathryn Brode

Faculty Sponsor: Michael Collins, Department of Biology

Sustainability Tools for Assessing and Rating Communities (STAR Community) is a program that municipal communities can join. The STAR Community program gives communities tools that allow them to become more environmentally sustainable. After an initial assessment, the community is scored on a points system and given a graded level of achievement. Evaluation measures are built environment; climate and energy; economy and jobs; education, arts, and community; equity and empowerment; health and safety; natural systems; and innovation. Within each evaluation measure are subcategories that are assigned a certain number of points, some being outcome points, and some being actions points. Communities are required to reapply with STAR Communities every few years, at which time, updated data are compiled. In many cases, communities that failed certain areas or measures the last time they certified can gather data proving that they have made strides in becoming more sustainable. When a report is submitted, a STAR Community employee will perform an overview of the report, making sure that each measure was executed, giving each measure a failed, passed, overridden, or partial point status. Communities can then reevaluate their report before final submission. The STAR

The Physical World I

1:30-2:15 pm

FJ-C

Moderator: Yi Song

1:30-1:45 pm Ultrasonic backscatter measurements of bone: relation to tissue microstructure

Jordan Ankersen, Evan Main, and Luke Fairbanks

Faculty Sponsor: Brent Hoffmeister, Department of Physics

Ultrasonic backscatter techniques are being developed to detect changes in bone caused by osteoporosis. One technique, called the apparent backscatter technique, analyzes the power of a portion of a backscatter signal. The goal of the present study was to investigate how bone mineral density (BMD) and the microstructure of human cancellous bone affect two apparent backscatter parameters: the apparent integrated backscatter (AIB) and the frequency slope apparent backscatter (FSAB). Ultrasonic measurements were performed with a 3.5 MHz broadband transducer on 54 specimens of human cancellous bone. Microstructural parameters and BMD were measured using x-ray micro-computed tomography. Relationships between AIB and FSAB and microstructural parameters were analyzed using univariate correlations, partial correlations, and stepwise linear regression.

1:45-2:00 pm Ultrasonic Backscatter Difference Measurements of Cancellous Bone at 1MHz

Phoebe Sharp, Evan Main, and Ann Viano, Department of Physics



droplets. Moreover, electrostatics are widely used in modern industry, such as laser printing and automotive spray painting. Our research project focuses on analyzing the electrostatic interaction between two charged conducting spheres in the limit when they are about to touch each other. By

Italian history; namely the Unification, Risorgimento, and post-WWI periods. In this study, the literary reception theory of Wolfgang Iser is used to better understand how meaning is transmitted from an author to reader, or in the case of a historical moment from a ruler to citizens. While the manifestations of Fascist communication in public spaces, written history, and public cartography may be largely disregarded by the literature, an understanding of their intended and realized function as well as the contextualization of Mussolini's actions with a theory of communication can add depth and artistry to the discussion of propaganda in Fascist Italy and clarify the reception of Rome as a city and of Fascism by Italian citizens.

11:50 am – 12:15 pm The Unspoken Demands of Slavery: The Exploitation of Female Slaves in the Memphis Slave Trade

Sarah Eiland

Faculty Sponsor: Timothy Huebner, Department of History

In the antebellum South, exploitats5z117 (l)-27(i)-2.533 (t)-2.53Ft'aza in

to the whole. The paper offers a third perspective that reconstructs the idealistic social-political narrative presented in the Aeneid on its own terms.

2:45-3:00 pm Social Class as Portrayed in Ancient Sumerian Debate Poetry

Noah Mesa

Faculty Sponsor: Michael Flexsenhar, Department of Religious Studies

The ancient Sumerian poem, the Debate between j(e)3.158 (j)3.158 (b)-0.958 158 (b)-0.c.158 (t)-2-5.0

1:45-2:00 pm The Case for Taiwan

Will Notelovitz

Faculty Sponsor: Seok-Won Lee, Department of History

This presentation looks into the formal international standing of the Republic of China and makes the argument for Taiwanese Independence. The territorial disputes between the People's Republic of China and the Republic of China have left the Republic of China isolated from the international community. The goal of this paper is to articulate that the Republic of China must rescind its claims of being China, and rather be internationally recognized as Taiwan. Although this decision will cause drastic shifts in the Geopolitics of the Region, along the threat of invasion, it is imperative for the future of Taiwan.

Spanish Senior Seminar I

2:15-3:15 pm

Language Center

Moderator: Clara Pascual-Argente, Department of Modern Languages & Literatures

2:15-2:30 pm Formal Ideology in Film Propaganda about the Spanish Civil War (1936-45)

Barry Rich

Faculty Sponsor: Clara Pascual-Argente, Department of Modern Languages & Literatures

The Spanish Civil War saw a marked growth in the production of war propaganda, in particular in cinematic form. The republicanos, nacionales, and their respective allies produced hundreds of films in order to rally support both within

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be useful to the study of the conde Lucanor and where it reaches its limits for the study of medieval Iberian culture.

Spanish Senior Seminar II

3:30-4:30 pm

Language Center

Moderator: Clara Pascual-Argente, Department of Modern Languages & Literatures

3:30-3:45 pm Finding fact in fiction: Subjective truth and collective memory in *El espíritu de la colmena* and *El Señor Presidente*

Sarah Morris

Faculty Sponsor: Clara Pascual-Argente, Department of Modern Languages & Literatures

Scholarship on the formation of post-dictatorial collective memory has highlighted the essential role of testimony (first-person narratives about personal experience), both as a way to counter the “official history” of the period and as a complement to a more objective but often detached presentation of historical facts. Here I contend that works of historical fiction contribute to collective memory in a manner similar to testimony, as they emphasize both subjective emotion and human experience. Two such works of historical fiction which elevate the role of subjective experience over diachronic truth are *El espíritu de la colmena* and *El Señor Presidente*.

multicultural reality? In this presentation, I will argue that these binaristic frameworks often prove insufficient to articulate the nuanced and multi-faceted nature of many Latino American experiences with language. The analysis of a representative corpus of Latino poetry (some written mostly in Spanish, some written mostly in English, and some defying strict, either-or categorization) focused (I)-12.558o go

necessary for this loss of UBR4 dependent growth phenotype. Silencing of HAT1 and PCNA also inhibited muscle growth. Loss of HAT1 in combination with loss of UBR4 in muscle prevented hypertrophic growth, indicating that increased HAT1 is necessary following loss of UBR4 for hypertrophy. This study establishes direct substrates of Ubr4, which emerge as novel regulators of muscle growth.

#3 Implementing standardized patient handoff procedures for interdepartmental transports between inpatient and OR

Ellie Sommerkamp, Jonathan Burlison and James Hoffman

Faculty Sponsor: Alan Jaslow, Department of Biology

One of the most vulnerable areas patient care is during patient handoffs and transfers, and The Joint Commission reported that communication failures are the leading contributing factor in medical errors that result in severe harm. Standardizing gitaang Com(m)-3.493 (e)3.157 (d)-0367 (p)-

shows the highest resistance over all the other strains. According to our results, Bactrim is a less effective antibiotic than Rifampacin.

#5 Targeting histone demethylase KDM6B for treatment of neuroblastoma

Anoushka Mullasseril, Rhodes College; Tara Rakiewicz, Drexel University; Jun Yang,

Department of Surgery, St. Jude Children's Research Hospital

Faculty Sponsor: Kimberly Brien, Department of Chemistry

Neuroblastoma is a cancer of the sympathetic neuron system that accounts for 15% of all childhood cancer-related deaths, an unusually high proportion based on the fact that it accounts

products' extract fraction, found in *Brunfelsia grandiflora*. Ongoing studies are focused on structure elucidation and characterization of promising compounds in the natural product fractionations. Further, mechanistic mode of action studies of the chemical composition of *Brunfelsia grandiflora* will be reported in due time.

#7 YBX1 Regulates Cell Proliferation in Developing Neural Tubes

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granule neurons display different migration behaviors in response to Ntn1 depending on their differentiation status and the surrounding substrate.

Biology 141

#9 Does Competition for Food Increase Aggression in Chickadees? () TJ 01 0.958 (t) 067 (C) 0.625h]

Gretta Hotz, Joshua Alexander, and Audrey Simpson

Faculty Sponsor: Carolyn Jaslow, Department of Biology

#10 The Effects of Varying NaCl Concentrations on Duckweed Growth

Meredith Bacue, Hannah Cantwell, Josh Hill, and Tran Hoat Faculty Sponsor: Carolyn Jaslow





preliminary evidence identifying potential binding partners to PaxB by utilizing GFP-Trap, a variant of co-immunoprecipitation.

#35 Defining the functional bases within centromeric promoters

Arati Joshi and Bayly Wheeler, Department of Biology

Faculty Sponsor: Bayly Wheeler, Department of Biology

During cellular division, DNA is duplicated and partitioned such that the two new cells inherit the same genetic information. Failure to form a centromere, a complex of DNA and proteins, causes errors in DNA division and can cause developmental defects in humans.

Heterochromatin, a condensed form of DNA and DNA-associated proteins, is necessary for centromere formation. Previous work has shown that RevCen, a transcribed DNA sequence present in multiple copies at the centromere, is sufficient to recruit heterochromatin and silence nearby genes. To test whether RevCen transcription is important for silencing, we engineered versions of RevCen without a promoter. We show that RevCen-mediated gene silencing is partially dependent on the presence of its promoter. Future work will confirm that the loss of gene silencing is accompanied by a loss of heterochromatin and will determine whether RevCen transcript levels decrease when the promoter is absent. To define the functional bases within the RevCen promoter, we will create a series of promoter deletion fragments and measure their ability to initiate transcription and establish heterochromatin. This work demonstrates that the RevCen promoter is important for gene silencing and will identify specific sequences within the promoter that are necessary for transcription and heterochromatin establishment.

#36 Characterizing the strength of individual centromeric promoters and their effect on heterochromatin establishment

Meryl Musicante and Bayly Wheeler, Department of Biology

Faculty Sponsor: Bayly Wheeler, Department of Biology

Centromeres are essential for chromosome segregation during cell division. In *Schizosaccharomyces pombe*, heterochromatin contributes to centromere formation by recruiting CENP-A, the centromere-specific histone variant. Heterochromatin forms at repetitive DNAs, but what enables these repeats to establish heterochromatin is incompletely understood. RevCen is a family of transcribed repeats that establishes heterochromatin at the centromere via the RNAi pathway. Our lab has shown that copies of RevCen differ in their ability to produce siRNAs and recruit heterochromatin. Our goal is to determine whether endogenous genetic variation within the RevCen promoter affects transcription and the ability of a repeat to establish heterochromatin. To measure the expression of a single copy of RevCen in a pool of highly similar centromeric transcripts, we engineered a version of RevCen with a novel seven base pair

whether the transcription of different RevCen variants is correlated with their ability to establish heterochromatin.

#37 Determining DNA Sequences Responsible for Heterochromatin Formation in *S. pombe*
Lauren Benfield and Madison Holton

Faculty Sponsor: Bayly Wheeler, Department of Biology

Centromere formation is required for proper chromosome segregation in cell division. One result of improper chromosome segregation is miscarriage. In fission yeast, centromeres are composed of centromeric chromatin and heterochromatin. Heterochromatin facilitates centromere formation and silences gene expression. RevCen, a transcribed DNA sequence found within all three centromeres, is sufficient to establish heterochromatin when removed from the fission yeast centromere. To identify the sequences within RevCen that are important for its function, we created copies of R

fields). Future work will test whether habitat features, such as the width and height of grasses and presence of perches, along rights-of-way relate to shrike presence.

#39 Treefall Gap Dynamics in an Urban Old Growth Forest

Griffin Williams, Marilyn Long, Mac Wilson, and Tara Massad

Faculty Sponsor: David Pike, Department of Biology

Treefall gaps are a critical component of forest dynamics that lead to the recruitment of a new cohort of seedlings and gap closure. Overton Park is an urban park with 126 acres of old growth forest, and long-term observations suggest gaps within the forest are failing to regenerate.

Possible explanations include lower rates of seed arrival in gaps, low germination rates of seeds,

and M06 as an intermediate between the two. Preliminary results show significant differences between the methods within the same complex, as well as potential in determining a well-suited derivative, that has seeded other promising ligands.

#46 DFT Study of the Selectivity of Monoamine Oxidase B (MAOB)

Audrey Woody and Samantha Jelinek; Larry Peterson, and Mauricio Cafiero,
Department of Chemistry

Faculty Sponsor: Mauricio Cafiero, Department of Chemistry

In the rational design of novel drugs, ligands are tailored to fit into a designated site on a target enzyme. While this approach can be very successful, it may lead to a molecule that is so carefully fitted to a binding site that a common point mutation may lead to loss of effectiveness



hydrogen formation, was observed at -2.276 V vs Fc/Fc⁺. Mo(O)₃(tpa) was then applied to light-driven systems for hydrogen generation.

#50 Nickel Complexes with N₂S₂ Ligands for Electrocatalytic and Light-Driven Hydrogen Production

John Dewar and William Eckenhoff, Department of Chemistry

Faculty Sponsor: William Eckenhoff, Department of Chemistry

#52 Lockless Distributed Work Stealing

John Snyder and Brian Larkins, Department of Mathematics & Computer Science

Faculty Sponsor: Brian Larkins, Department of Mathematics & Computer Science

Work stealing is a scalable method of dynamic work distribution. Scioto, a work stealing API, had scalable support for distributed work stealing. However, it relied on locks gathered by the initiator side to allow for work stealing. This meant in order to steal work, it required three communications. We propose a new implementation of Scioto that is built on top of a different distributed memory abstraction that allows for only one communication per steal.

#53 Dosing of Perampanel in Children: Correlation with Serum Levels

Elizabeth Gaudio and James Wheless, University of Tennessee Health Center, Le Bonheur Children's Hospital Neuroscience Institute

Faculty Sponsor: James Wheless, University of Tennessee Health Center, Le Bonheur Children's Hospital Neuroscience Institute

INTRODUCTION: Anti-epileptic drug (AED) perampanel (PER) is approved for adjunctive use in children 12 and older. PER is metabolized by enzyme CYP3A4. Enzyme-inducing AED's (EIAED) taken concomitantly are known to influence serum levels. This study investigates PER dose, serum levels and the effect of concomitant EIAED's on LeBonheur patients prescribed PER between Jan 2013 and May 2017. **METHODS:** A retrospective chart review involving data extraction of patient age, PER serum level, weight, prescribed PER dose, and concomitant drugs was performed. Patients were organized into age groups and concomitant EIAED presence. **RESULTS:** Of the 86 patients included in the study, 41 of them were concomitantly prescribed an EIAED. Although prescribed PER dose did not differ between patients concomitantly prescribed EIAED's and those not prescribed EIAED's, PER serum levels were significantly lower in the EIAED group. A previous study reported that PER efficacy increases with serum level. However, the average PER serum level for the EIAED group was still well above the

Motor (indexed by TMS and fMRI) and behavioral measures were obtained in 8 children with AIS and 10 healthy age matched cohort (HC). Results: When compared to HC, patients with AIS demonstrated increased inhibition measured as ipsilateral silent period by TMS in both lesioned and contra-lesional hemispheres, while the measures of cortical excitation, in both hemispheres were found to be similar. fMRI during a finger-tapping task showed decreased strength and volume of activation in the primary motor cortex, supplementary motor area and cerebellum in the lesional, compared to the contra-lesional hemisphere. Clinical motor evaluation showed gross functional recovery, but fine motor control was significantly impaired in both hemispheres. Conclusions: Consistent with our hypothesis, we observed network-wide hemodynamic decrease in the lesioned hemisphere. In addition, our data demonstrate impaired inhibitory circuitry and fine motor behavior extending to the contra-lesional hemisphere indicating pervasive dysfunction of both lesioned and contra-lesional hemispheres in pediatric AIS.

#55 No change in perceived hand size after Rubber Hand Illusion induction

Sam Thomasson and Jason Haberman, Department of Psychology

Faculty Sponsor: Jason Haberman, Department of Psychology

The human brain develops a representation of one's own body by integrating visual, proprioceptive, and somatosensory information into a coherent whole. This representation can be altered or disrupted when the sensory input is altered. The Rubber Hand Illusion (RHI) can be used to induce ownership of a fake hand into a subject's self-representation. Although the RHI may be robustly induced by objects that only vaguely resemble a real hand (e.g., a rubber glove), it remains unknown whether the size representation of one's hand may be manipulated by changing the size of the inducer. In this experiment, we tested whether induction of the Rubber Hand Illusion can alter an observer's hand size representation toward the size of the fake hand. Before and after induction of the Rubber Hand Illusion, observers were shown images of their own hand at various sizes and asked whether the image was smaller or larger than their real hand. After successful induction of the illusion, observers' responses did not show a change in perceived size of their own hand. This implies that observers may experience ownership of the hand while not integrating all features of the hand (e.g., size) into their own body representations.

#56 Conceptual size ensembles cannot be predicted by individual item size representations

Sneha Suresh and Jason Haberman, Department of Psychology

Faculty Sponsor: Jason Haberman, Department of Psychology

may be predicted by the size representation of the individual items composing the group. In every trial, observers viewed an individual triangle with and without linear perspective cues and judged whether a subsequently presented test triangle was larger or smaller than the preceding triangle. Whereas observers were biased to perceive the average size of multiple triangles as larger when presented in the context of linear perspective cues (i.e., conceptual size averaging), they did not take those cues into account when estimating the size of a single triangle. That is, observers perceived a single triangle in the context of linear perspective cues as the same size as a single triangle without linear perspective cues. These results suggest the generation of a

cued to report the average of just one of the sets. The ensembles could either be mixed, in which



back condition, but the reverse relationship was observed in the n-back condition. Discussion will consider the implications of the observed age differences in reminding for the spacing effect.

#65 Distress and Symptom Change among Transgender and Gender Non-conforming Racial/ethnic Minorities

Alexis Franklin, William-Michael Stone, and Sydney Sorrell

Faculty Sponsor: Tyler Lefevor, Department of Psychology

The current study employs an intersectional framework to understand how well counselors are meeting the needs of transgender and gender non-conforming (TGNC) racial/ethnic minorities (REM) clients by examining clients' initial anxiety and depression levels and changes in symptoms through psychotherapy. Data from 41,691 participants from the Center for Collegiate Mental Health 2012-2016 data set were analyzed. Results from hierarchical linear modeling indicate higher baseline anxiety and depression among TGNC clients and significant but minimally faster rates of change of depression symptoms among cisgender clients. REM clients presented with lower baseline anxiety, but higher baseline depression. REM clients demonstrated faster rates of change of depression, but no differences in rates of change of anxiety compared to White clients. No significant interaction effects between TGNC and REM identities were found, but main effects held such that TGNC REM clients experienced more distress than any other group.

#66 Optimizing Well-being in Lesbian, Gay, Bisexual, and Same-Sex-Attracted Mormons
Caldwell Huffmann and Isabelle Blaber

Faculty Sponsor: Tyler Lefevor, Department of Psychology

Little research exists on the intersection of sexuality and religiosity, especially in a Mormon context. Many conservative religio-



automatically attend to negative stimuli. In addition, research indicates that younger and older adults can engage controlled attention to prioritize the memorization of one subset of materials over another subset of materials. This has been demonstrated previously through the Value Directed Encoding Paradigm by which cognitive control is employed in order to prioritize value-based information. Importantly, research has yet to examine how these automatic emotional biases operate in congruence or in opposition to controlled attention and how this may influence memory for associations. Using the Value Directed Encoding paradigm, the current study investigated the ways in which emotionally valenced stimuli may interact in congruence and in opposition with point value. Findings may provide a more nuanced understanding of associative memory and offer valuable insight in addressing the associative deficit observed in older adults.

Fine Arts

#72 Evolution of the Harp

Petra Dhinakaran, Christopher Goza, Katarina Olsen, and Zhiyu Zhao

Faculty Sponsor: Gina Neupert, Department of Music

While the modern harp is often noted for its unique, beautiful structure, the angelic instrument appeared very different centuries ago. The history of the harp indicates that it is one of the oldest known instruments, having existed in one form or another, in every land and every age. Wall paintings of ancient Egyptian tombs dating from as early as 3000 B.C. show an instrument that closely resembles the hunter's bow without the pillar that we find in modern harps. Over the years, each culture has modified this whimsical soft-sounding instrument from its primitive hunting bow shape to its own variation. Together these alterations across the globe have helped create today's harp.

Deaf Studies Fellowships

#73 ASL and English Mixing: Causes and Effects

Lee Kezar

Faculty Sponsor: Lori Garner, Department of English

ASL is an independent language, but we often see it mixed with English both in sign and speech. This phenomenon can be ascribed to several different causes, ranging from more innocent reasons like ASL learners filling their knowledge gaps with English (Cokely, 1983) or bilingual,



business ventures. Policies that practically provide counsel, accommodation, and mentorship in schools and in the workplace can help ensure deaf entrepreneurship success.

POSTER SESSION II

Multi-Sports Forum in the Bryan Campus Life Center

4:00-6:00 pm

Poster numbers are listed with each title.

St. Jude Summer Plus Fellowships

#1 The Effects of Mitochondrial Mutation of Tumorigenesis

Danielle Healey and Xiujie Li Harms, St. Jude Children's Research Hospital, Department of Pathology

Faculty Sponsor: William Eckenhoff, Department of Chemistry

This paper investigated the activity of tumorigenesis within mitochondrially mutated progenitor cells. It seeks to answer how the epigenetics of mitochondrially mutated cells containing the N-Myc oncogene changes the rate of tumorigenesis. The experiment investigated the changes in methylation and acetylation of the N-Myc infected progenitor cells to determine the extent that gene expression and regulation were occurring at. It focused on the differences in acetylation and methylation regarding the different genotypes in the PolG mice model (wild type, heterozygous, homozygous) containing the N-Myc gene. Immunofluorescent imaging was used to quan2.542 (n)-0.95

tested whether the proteins identified by proteomic analysis are direct substrates of Ubr4 by co-immunoprecipitation experiments. The proteins Ube2b, Hat1, Rbbp4 and Rbbp7 were shown to interact with UBR4 and required Ubr4 for ubiquitination. Tissue specific UBR4 silencing leads to increased growth of the eyes and muscle in *Drosophila Melanogaster*. Epistatic analysis in the eyes confirmed that several proteins regulated by UBR4, including HAT1 and PCNA, were necessary for this loss of UBR4 dependent growth phenotype. Silencing of HAT1 and PCNA also inhibited muscle growth. Loss of HAT1 in combination with loss of UBR4 in muscle prevented hypertrophic growth, indicating that increased HAT1 is necessary following loss of UBR4 for hypertrophy. This study establishes direct substrates of Ubr4, which emerge as novel regulators of muscle growth.

#3 Implementing standardized patient handoff procedures for interdepartmental transports between inpatient and OR

counted on each plate. Plates with a greater number of colonies indicated greater resistance. The strains included T4, a wild type strain, HexA, a mutant with a higher frequency of mutation, ComeC, a mutant with a lower frequency of mutation, and a hybrid of HexA and ComeC. It was predicted that the HexA would have the greatest number of colonies, and ComeC would have had the smallest. For Rifampacin this appeared to be the case. For Bactrim, however, T4 shows the highest resistance over all the other strains. According to our results, Bactrim is a less effective antibiotic than Rifampacin.

#5 Targeting histone demethylase KDM6B for treatment of neuroblastoma

Anoushka Mullasseril, Rhodes College; Tara Rakiewicz, Drexel University; Jun Yang, Department of Surgery, St. Jude Children's Research Hospital

Faculty Sponsor: Kimberly Brien, Department of Chemistry

Neuroblastoma is a cancer of the sympathetic neuron system that accounts for 15% of all childhood cancer-related deaths, an unusually high proportion based on the fact that it accounts for 7% of childhood malignancies. The survival rate for high-risk neuroblastoma is only 40% with current treatments including chemotherapy and radiation which cause unwanted side effects. There is growing interest to develop novel therapies by targeting epigenetic factors.

KDM6B, a histone demethylase also known as JMJD3, is known to play a role in various types of cancer such as NOTCH1-mediated T-cell acute lymphoblastic leukemia. However, the role of KDM6B in neuroblastoma is largely unknown. We are currently investigating the role of KDM6B in neuroblastoma using a CRISPR-Cas9 system to generate KDM6B-deficient neuroblastoma cell lines. We have successfully generated KDM6B-deficient neuroblastoma cell lines and are currently performing functional assays to determine the role of KDM6B in neuroblastoma. We have also performed ChIP-seq analysis to determine the binding sites of KDM6B in neuroblastoma cells. We have identified several binding sites for KDM6B in neuroblastoma cells and are currently performing ChIP-qPCR analysis to determine the binding of KDM6B to these sites. We have also performed Western blot analysis to determine the levels of KDM6B in neuroblastoma cells. We have identified several neuroblastoma cell lines with high levels of KDM6B and are currently performing functional assays to determine the role of KDM6B in these cell lines. We have also performed ChIP-seq analysis to determine the binding sites of KDM6B in these cell lines. We have identified several binding sites for KDM6B in these cell lines and are currently performing ChIP-qPCR analysis to determine the binding of KDM6B to these sites. We have also performed Western blot analysis to determine the levels of KDM6B in these cell lines. We have identified several neuroblastoma cell lines with low levels of KDM6B and are currently performing functional assays to determine the role of KDM6B in these cell lines. We have also performed ChIP-seq analysis to determine the binding sites of KDM6B in these cell lines. We have identified several binding sites for KDM6B in these cell lines and are currently performing ChIP-qPCR analysis to determine the binding of KDM6B to these sites. We have also performed Western blot analysis to determine the levels of KDM6B in these cell lines.

#16



A2 receptor (PLA2R). The goal of this research is to design PLA2R specific binding proteins that will prevent the PLA2R autoantibodies from binding to the C-Type Lectin Domain Number Seven of the PLA2R antigen. Using Eptopia and EPCES, three possible epitope sites regions were identified and characterized. Binding strength was measured through Rosetta Online Server that Includes Everyone (ROSIE). Presently, mutations to increase the binding proficiency to the predicted epitope regions on the CTLD-7 are being optimized. Furthermore, this research could provide patients with more specific methods of treatment for AD than the current immunosuppressive therapies.

#28 Analyzing Protein Kinase C domain interactions with the formin SepA.

Yahya Hameed, Brianna Betton, Lynsey Campbell, William Freyaldenhoven, Elisabet Olsen, Ashmeet Singh, and Pramika Sriram

Faculty Sponsor: Loretta Jackson-Hayes, Departa Hs

IL-10 expression was shown to enhance the acute phase of pathogenicity in a murine gammaherpesvirus model but did not affect latent populations of host IL-10. Using this model,



amplify expression and identify genes. Next, we will verify CHR23 expression and further identify parental contribution to Arabidopsis seed size.

#34 Characterizing the Genetic Interaction of AtFH5 and ROP2 in Seed Size and Pollen Tube

#36 Relationship Between Long Acting Reversible Contraceptive Use in Adolescent Females and Sexually Transmitted Disease

Filoteia Popescu, Rhodes College; Karen Derefinko, Department of Preventive Medicine, University of Tennessee Health Science Center

Faculty Sponsor: Charles Snyder, Department of Anthropology & Sociology

Teenage pregnancy remains a national health concern, and there are several health and social risks associated with teenage motherhood, including complications during pregnancy and unsafe abortions. In addition, babies born to adolescent mothers generally have substantially elevated risk of birth complications (preterm birth, low birthweight, death). Although a number of

#38 Synthesis and computational evaluation of vorinostat boron derivatives as potential histone deacetylase inhibitors

Barry Rich, Emma Goldman, Caylon Martin, and Shana Stoddard, Department of Chemistry

Faculty Sponsor: Kimberly Brien, Department of Chemistry

Histone deacetylase inhibitors (HDACi) are presently being used for the therapeutic intervention for various cancers. The histone deacetylase (HDAC) family is involved in the regulation of gene expression and is comprised of 18 different isozymes. One HDAC receptor that is currently being targeted for therapeutic intervention is HDAC2, which has been shown to be overexpressed in colorectal cancer. Another HDAC receptor HDAC8 is known to be overexpressed in neuroblastoma a pediatric cancer. Panobinostat and vorinostat, two current HDACi approved for clinical use, were compared to a set of four boron containing vorinostat derivatives (BCVD) in both HDAC2 and HDAC8 receptors using Sybyl-X docking analysis. Results showed that one BCVD was able to outcompete vorinostat in HDAC2 while 3 derivatives outcompeted vorinostat in HDAC8. Two derivatives were also able to outcompete panobinostat in HDAC8. The synthesis and computational studies will be detailed herein.

#39 Nickel Schiff Base Complexes for Light Driven Hydrogen Production

Meghan Kiker and Alex Graves

Faculty Sponsor: William Eckenhoff, Department of Chemistry

Over the next century, the world's population is expected to increase at a drastic rate; therefore it is essential to consider new and more efficient sources of energy such as the use of artificial photosynthesis to generate hydrogen gas. Hence, the development of more active and robust catalysts is necessary in order to make artificial photosynthesis a viable method of hydrogen generation. Recent studies have shown that cobalt complexes with polypyridyl groups are highly active and thus lead to a lower overpotential and higher turnover rate of hydrogen gas. Using 1,1'-(pyridine-2,6-diyl)bis(2-(pyridin-2-yl)ethyl)ethan-1-imine is a promising ligand to study due to its electronic similarity to previously used ligands for cobalt catalyzed hydrogen production. However, the two pyridine substituents may act as pendant bases, enhancing its activity. Nickel complexes were synthesized with this ligand and were spectroscopically and electrochemically characterized. X-ray diffraction revealed an octahedral geometry for $[\text{Ni}(\text{EtPyPDI})\text{NO}_3]\text{NO}_3$ comprising pentadentate chelation of the EtPyPDI ligand and nitrate coordination. Cyclic voltammetry experiments showed reversible redox waves at -0.92 and -1.77 V vs Fc/Fc+. In the presence of acetic acid, a catalytic wave corresponding to hydrogen formation was observed at -2.26 V vs Fc/Fc+. Hydrogen production was observed under electrocatalytic and light-driven conditions.

#40 Analysis of nicotine in clay samples by solvent extraction and gas chromatography mass spectrometry

Nada Lelovic, Nuanqiu Hou, Christine Chuang, and Jessica Ustick; Dhammika Muesse and Jon Russ, Department of Chemistry

Faculty Sponsor: Dhammika Muesse, Department of Chemistry

Detecting nicotine in historic and prehistoric smoking pipes is important in understanding the

analysis shows redox waves at -0.725V and -2.147V vs Fc/Fc+. In the presence of acetic acid, a catalytic wave, indicative of hydrogen formation, was observed at -2.147 V vs Fc/Fc+. These results suggest that this complex might be suitable in light driven artificial photosynthetic systems.

#43 Experimental and Calculated Solvatochromic Characteristics of MoCl₄(diimine) Anions

Alison Chang and William Eckenhoff, Department of Chemistry

Faculty Sponsor: William Eckenhoff, Department of Chemistry

A solvatochromic compound is a chemical compound that changes its color based on solvent polarity. Various molybdenum anions with the form [Mo(N[^]N)Cl₄]- and [Mo₂(N[^]N,N[^]N)Cl₈]²⁻, were found to possess solvatochromic behavior. [Li(12-crown-4)][Mo(bpy)Cl₄] was found to be soluble in solvents ranging from water to acetone with an accompanying color change from yellow to blue. Similar colors were observed for the related [PPh₄][Mo(bpy)Cl₄] in the same solvents. When examined by UV-vis, the absorption of [Li(12-crown-4)][Mo(bpy)Cl₄] shifted ~110nm across the visible region while [PPh₄][Mo(bpy)Cl₄] shifted ~70nm. X-ray crystal structures of both of these species show very little difference in the structure of their octahedral Mo anion and good agreement with previously known structures. A bimetallic molybdenum compound, [Li(12-crown-4)]₂[Mo₂(bppz)Cl₈] (bppz=2,3-bis(2-pyridyl)pyrazine), was found to display solvatochromism red-shifted in respect to its monometallic counterpart, covering over ~140nm the visible region in the same solvents. However, another bimetallic compound [Li(12-crown-4)]₂[Mo₂(bpm)Cl₈] (bpm=2,2-bipyrimidine) was more similar to [Mo(bpy)Cl₄]- and displayed a similar color range and solvatochromic shift. Molecular calculations are currently underway to better understand this interesting effect.

#44 New therapeutic tools for IMN: Design of antigen specific binding proteins targeting the THSD7A antigen

Mounika Aramandla and Maggie Palopoli

Faculty Sponsor: Shana Stoddard, Department of Chemistry

Autoimmune diseases (AD) result from the attack of healthy cells by the immune system. AD are the second leading cause of chronic illness. Current therapies combatting AD, immunosuppressive medicines, are non-specific and weaken the patient's immune system, decreasing the ability to elicit a full immune response, thus putting them at higher risk of being unable to fight off basic infections. Idiopathic membranous nephropathy is a kidney specific AD affecting 10-12 million people. One subset of patients with IMN produce autoantibodies that target the thrombospondin type-1 domain-containing 7A (THSD7A). In this work, THSD7A antigen specific binding proteins are being designed to prevent the THSD7A autoantibodies from binding the THSD7A antigen. Characterization of the five potential epitope clusters identified

substituents exhibited the most favorable desolvation energies in each of the explicit water models. The implicit Polarizable Continuum Model was also used together with explicit solvation to calculate desolvation energies of dopaminergic ligands. The use of implicit and

derivatives has been developed as potential inhibitors of the PheOH enzyme. The inhibitory effectiveness of these dopaminergic derivatives has been measured via in silico models in which the strength of interaction between each substrate and the enzymatic active site was analyzed. A crystal-structure of the PheOH active site, with bound thienylalanine, was isolated from the Protein Data Bank (PDB ID: 1KW0). Mutants of the wildtype structure have been created from

measure of V1aR expression for each area. Based on previous research, we predict that breeding

homozygous flies and the offspring were raised entirely on food with or without drug in DMSO or DMSO alone control food at 25°C. Adult flies were removed after 3 days and newly emerging flies were aged for 4 days prior to the BSA. Flies were subjected to 10s of stress induced seizures and then immediately sorted for seizure vs non-seizure, then scored for genotype in order to identify repo>Dube3a animals in both seizure and non-seizure groups. We identified 13 potential candidates that can suppress seizures in repo>Dube3a flies.

#56 Determining the Seizure Outcome in Pediatric Patients With a Vagus Nerve Stimulator (VNS) and Investigating the Re-Organizing o

Nithila Ramesh, Rhodes College; Abbas Babajani-Feremi, Department of Pediatrics, University of Tennessee Health Sciences Center; and Nagar Noorizadeh, Department of Pediatrics, University of Tennessee Health Sciences Center

Faculty Sponsor: Kelly Dougherty, Department of Biology

Within the context of temporal lobe resections, a year of being seizure-free can be highly anticipated in 53-84% of patients with their anteromesial temporal lobe resected, and in 66-100% of those with localized epilepsy (Spencer, S., & Huh, L et al. 2008). However, in those patients with partial or generalized epilepsy, such resections are not always medically recommended due to their invasive nature; additionally, approximately 30% of epilepsy patients still experience seizing even after tailored medical treatment. The goal of this study is to locate a biomarker or determine a set of biological and medical parameters that can determine the seizure frequency of a patient that has undergone VNS placement for generalized or partial epilepsy, and to see if there is any reorganization of the brain network from before to after VNS implementation.

Utilizing a combination of functional MRI, high-density EEG, MEG, and neuropsychological evaluations and subsequent data that have been analyzed through the MATLAB data analysis program, patients that have been examined before, during, and after VNS implantation were analyzed for biomarkers such as functional connectivity1(e)3.15 (n)-0(, M)-2.7 (E)-10.183 (G)0.617 (,)3.1

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Social Sciences

#62A Social Judgements Study: Race by Social Class Association

Sydnie Schlinder

Faculty Sponsor: Matthew Weeks, Department of Psychology

Based on previous research, we expect White targets to be associated with higher levels of SES and B (e).075 (ES)-5.5423chihndtsr bhoxpg of SES



#70 The Effectiveness of Precues in Proactively Controlling Emotional Interference During Speech Production

Lisa His and Emily Watkins

Faculty Sponsor: Katherine White, Department of Psychology

and fillers was also found when narratives described negative memories. These findings suggest that the way in which older adults approach their positive and negative memories is reflected in their speech production.

#72 Healthy Aging Communities: A Model for Healthy Community-Based Aging in Memphis and Beyond

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