SCHOLARSHIP
SEWANEE 2016

An annual celebration of student scholarship

Making Knowledge,
Making Scholars,
Making Impact

April 22, 2016
WELCOME!

Welcome to Scholarship Sewanee, our campus-wide celebration of student scholarship and creative work. The mission statement of the Undergraduate Research Initiative is

“To enhance student engagement, critical thinking and problem solving through meaningful intellectual student-faculty interaction, every student and faculty member will have the opportunity to engage in collaborative research or creative work in a vibrant and encouraging environment supported by the University as a whole”

Scholarship Sewanee is a critical part of this mission. It provides an outlet for students to share their outstanding work with the larger academic community in an open and supportive environment. This day of celebration also serve as an opportunity for members of the wider community to recognize both the students and the faculty mentors for their commitment to the ideals of scholarship and learning, their desire to make both new knowledge and a positive impact. In many ways scholarly work is not complete until it is shared with others; hence, your decision to join in our celebration of this work completes it and makes the scholarly process whole. Thank you for coming and we hope you have an insightful and enjoyable experience.

Events such as this symposium are only possible through the contributions of numerous generous benefactors. The following people and groups are gratefully acknowledged for their continuing support of Scholarship Sewanee:

- Walter and Mayna Nance
- The Andrew W. Mellon Foundation
- The Undergraduate Research Advisory Committee
- The Office of the Dean of the College
- Elizabeth Ellis, Erin Cassell, & Charles McClain
- Physical Plant Services
- Print Services
- The Student Presenters
- All the Faculty Sponsors and Mentors
- You!

Thank you!
Schedule of Events

Friday April 22, 2016

8:30 AM - 12:00 PM Oral Presentations B, C, & D
Spencer Hall Classroom

1:00 PM - 2:00 PM: McCrady Lecture
Blackman Auditorium

2:15 PM - 5:15 PM Oral Presentations
Convocation Hall, Spencer Hall, and the University Archives

2:15 PM - 4:45 PM: Poster Presentations
Harris Commons (Spencer Hall)

7:30 PM: “Gloria in Spring”
Sewanee Symphony Orchestra and the University Choir
All Saints Chapel

2016 McCrady Lecture

Dr. Dale Peterson
Author and Biographer to Jane Goodall
“Love, Death, and Chimpanzees”

Past McCrady Lecturers

2015 - Dr. Jeffery Lovich, U.S. Geological Survey and Northern Arizona University
2014 - Professor Paul Bartrop, Florida Gulf Coast University
2013 - Professor Rebecca Burwell, Brown University
ORAL PRESENTATIONS

PANELS A: Art and Art History- Convocation Hall

2:15 PM  Stories of the Past
          Adrian Bowie

2:45 PM  Redefine: Annie Bagay
          Annie Bagay

3:15 PM  Creation by Destruction
          Joshua Treadwell

3:45 PM  Redefine
          Mimi Middlebrooks

4:15 PM  Mind in Rhapsody
          Yunxin Xing

4:45 PM  BODY of Work
          Lucy McMahon

PANELS B: Departments of Politics, Economics, History, & International & Global Studies - Spencer 151

9:00 AM  The Internet Generation: Differences in Political Participation Across Age Groups
          Karen Bjerre - Politics

9:30 AM  The Transmission of Cultural Identity Among Syrian Refugees in the Hashemite Kingdom of Jordan
          Kathleen Kelso - Politics

10:00 AM In Opposition to the Glass Ceiling: An Analysis of the Performance of S&P 100 Companies with Female CEOs and Gender Diverse Boards
          Killen Cooper - Economics

10:30 AM Do Black Lives Matter? Racism within the United States’ Law Enforcement System
          Liz Arza - Economics

11:00 AM The Effect of Water Rate Structures on Use
          Matson Conrad - Economics

11:30 AM Testing the Porter Hypothesis: Environmental Regulation and Industry Productivity
          Alexandra Willoughby - Economics

3:05 PM  The Franco-Prussian War: Its Impact on France and Germany, 1870-1914
          Emily Murray - History

3:25 PM  “Worthy of th’heroic dead”: Local Gratitude and National Mourning in England’s Thankful Villages
          David Prehn - History

3:45 PM  “Wonderful is the Strength and Force of Prayer”: The Evolution of Tudor Primers
          William Stokes - History

4:05 PM  A Trade of Horrors: Human Trafficking in Russia and Armenia
          Taylor Yost - International & Global Studies

4:25 PM  The United Nations and the Challenge of Humanitarian Intervention: A Case Study Approach
          Abby Felts International & Global Studies

Special Presentation by the History Department in University Archives and Special Collections!

2:15 PM  The Wunderkammer as Laboratory? Early Modern Museums in Historical Context
          Monsters, Marvels, and Museums
PANELS C: Departments of Biology, Psychology, Biochemistry, and Geology - Spencer 164
8:30 AM  Ant Diversity in the Coffee Agroecosystems in the Central Plateau of Haiti
Geanina Fripp - Biology
8:50 AM  Interactive Effects of Temperature and Glyphosate Concentration on the Behavior of Blue Ridge Two-Lined Salamanders, Eurycea wilderae
Jaina Gandhi - Biology
9:10 AM  Exome Sequencing in Tourette Syndrome and Genetic Screening in a C. elegans Model of Machado Joseph Disease
Petra Richer- Biology
9:30 AM To Flee or Not to Flee: How Terrestrial Salamanders Respond to a Simulated Attack
Margaret Bliss- Biology
10:10 AM Elevated Temperatures Alter Individual Performance and Competitive Outcomes in Desmognathine Salamanders
Lindsey Liles - Biology
10:30 AM HDAC-Mediated Transcriptional Control of GIMAP7
Jacob Zalewski - Biology
10:50 AM Environmental Correlates and Fitness Consequences of a Flower Color Polymorphism in Boechera Stricta
Ansley McDurmon Biology
11:10 AM Stream Salamander Distribution Patterns of the southern Cumberland Plateau
Philip Gould - Biology
2:15 PM Crowdsourcing: A New Culturally Relevant Measure of Assertiveness
Jemima Senoga- Psychology
2:35 PM Early Experience with Prehospital TXA: Protocol Appropriately Identifies Trauma Patients Requiring Transfusion and Reduces Time to TXA Administration
Neal Bartl - Biochemistry
2:55 PM Colluvial Mass Movements below the Bluff Line: Using LiDAR to Survey Domain Landslides
Daniel Fortner - Forestry and Geology
3:15 PM Genome-Wide Analysis of HDAC3 Regulated Target Genes in Developing T-cells
David Pride - Biology
3:55 PM Does Riparian Disturbance Alter Anti-Predator Behaviors?
Amanda Liford- Biology

PANELS D: Philosophy, Women and Gender Studies, English, & Art History - Spencer 262
9:00 AM Framing Social Life at Sewanee
Dr. Jim Peterman - Philosophy
9:30 AM Hymen Mythologies: Blood, Pain, and Self-Fulfilling Prophecies
April Kosakoff - Women and Gender Studies
10:00 AM Perceptible Absurdity in Beckett’s “Krapp’s Last Tape”
Robert Beeland - English
10:30 AM The Corporeal Unincorporated: Pathetic Disembodiment in Kazuo Ishiguro’s “The Remains of the Day”
Sally Burgess - English
11:00 AM Ubiquitous Uncertainty: Langston Hughes and the Power of Folk Blues
Zack Loehle - English
11:30 AM A Summer in Haiti - Photographs as Tools for Community Development
Hunter Swenson - Art & Art History

Abstract descriptions can be found on the next page
ABSTRACT A1

Stories of the Past
Adrian Bowie
Department of Art and Art History
Faculty Sponsor/Mentor: Dr. Greg Pond, Dr. Pradip Malde, Dr. Jessica Wohl, and Dr. Geoffrey Whittle

Time: 2:15 PM / Location: Convocation

The content of my work focuses on trauma and how it effects one in the past as well as present. I consider my works one cohesive unit despite being made individually, creating a narrative about previous experiences in my life. Creating works based on memory is an important strategy for me. I use a combination of simple objects appearing as broken or damaged as well as work with shadows. I incorporate charcoal as well as paint into many of my pieces. I hope for individuals to see my work and wonder what hidden meaning(s) can be represented. Currently, I am influenced by my own childhood and adolescence and how I am resolving and being effected by memories now that I am older. This work explores trauma as it relates to memory but also takes the viewer away from the idea of being realistic into memory.

ABSTRACT A2

Redefine: Annie Bagay
Anne Bagay
Department of Art and Art History
Faculty Sponsor/Mentor: Dr. Greg Pond

Time: 2:45 PM / Location: Convocation

In this body of work, Annie Bagay explores the relationship of where normal meets strange and mysterious. The grotesque, that invokes a feeling of uncomfortable bizarreness, provides an unpleasant and strange sensation to her work.

ABSTRACT A3

Creation by Destruction
Joshua Treadwell
Department of Art and Art History
Faculty Sponsor/Mentor: Dr. Greg Pond

Time: 3:15 PM / Location: Convocation

This body of work explores the tactile components of self-destructive experiences, using techniques, which exemplify tactile processes. The use of these techniques to construct work serves to rationalize nonsensical damage and pain. Creation of the work provides an outlet for these self-destructive tendencies and gives them purpose. The self-destructive nature shown in this body of work also speaks to a need for control. Artistically this control can relate to the control of material, surface, color, or any number of things. In conjunction with these artistic qualities, elements of control in human nature are also expressed. People seek to control: their bodies, emotions, and even thoughts. These works, which explore both artistic and human control, build on the hyper-controlling nature of our society and also work to embrace what cannot be controlled or contained.
ABSTRACT A4

Redefine
Mimi Middlebrooks
Department of Art and Art History
Faculty Sponsor/Mentor: Dr. Greg Pond, Dr. Pradip Malde, and Dr. Jeffrey Whittle

Time: 3:45 PM  / Location: Convocation

As a part of the art major comprehensive exam, I plan to present the works of art that I have created this academic year. I am drawn to the human form and the transformations it experiences throughout life. Beginning with birth, the very first transformation that we experience in this world, the idea of the body as place is explored. Place being something that is both internal and external to the body, painted parts of the human form are neighbored with collaged maps connect the experience of the body with the importance of place. Disembodiment and fragmentation of the form speak to feeling incomplete when one is lost. As they interact with the maps, the bodies yearn for placement and belonging. The maps symbolize the transformation that derives from discovering a place of belonging within ones own body, as well as in an external environment. These paintings celebrate the body as an individual and unique place. They embrace change, sensuality, motion, and nudity all as a part of life.

ABSTRACT A5

Mind in Rhapsody
Yunxin Xing
Department of Art and Art History
Faculty Sponsor/Mentor: Dr. Greg Pond, Dr. Pradip Malde, Dr. Jessica Wohl

Time: 4:15 PM  / Location: Convocation

Influenced by many contemporary artists including Richard Long, Francis Alys, Janine Antoni, and Tony Orrico, this body of work explores the possibility of taking marks left by human beings as the important visual language in the process of art making to respond to the spontaneous overflow of powerful emotions. This body of work takes two distinctive approaches that engage in the dialogue of pain and passion. Figurative representations directly introduces the viewer with the image of the solitary figure falling into depression with the body curling up in desolate corner. The long scroll drawings withdraw from the limited narrowness and provide the viewer with the space that is massive and inclusive for thoughts and emotions. This body of work investigates the relationship of pain and passion, and explores the vitality of expression that is free of calculation, deliberate sophistication, and narrow thinking.

ABSTRACT A6

BODY of Work
Lucy McMahon
Department of Art and Art History
Faculty Sponsor/Mentor: Dr. Greg Pond

Time: 4:45 PM  / Location: Convocation

The body of works largely consists of single and multiple painted nude female figures dominating a large canvas, with nearly all of the figures slightly larger than life size, and a similar, stereotypically feminine color palette throughout all of the paintings. The body is the central focus of each piece as a woman’s body is constantly critiqued, judged, and violated but should be appreciated and celebrated. The artwork shifts from representing the mistreatment of women and the mistreatment of one human being brought on by another, to a recognition of the beauty of the female body. The pieces intend to not only expose the harm that one person has caused to another, but to show that despite infliction and judgment, the body is beautiful and should be seen so that it can be respected and appreciated.
The Internet Generation: Differences in Political Participation Across Age Groups
Karen Bjerre
Department of Politics
Faculty Sponsor/Mentor: Dr. Melody Crowder-Meyer

Time: 9:00 AM / Location: Spencer 151

As the political scene in America continues to evolve, new ways for constituents to make their opinions known to elected officials emerge. For example, following the proliferation of the Internet, political campaigns and governing institutions have increasingly shifted their focus to strengthen their online presence. This paper examines patterns of participation in this new framework through the lens of age by using ANES survey data from the 2012 election cycle. By looking at differences in participation by age group, I find that younger participants favor online participation over more traditional types. This pattern raises questions concerning the effectiveness of different types of communication between elected officials and their constituents and about whether or not this new trend could lessen the participation gap that currently exists between age groups.

The Transmission of Cultural Identity Among Syrian Refugees in the Hashemite Kingdom of Jordan
Kathleen Kelso
Department of Politics
Department of Anthropology
Faculty Sponsor/Mentor: Conducted research abroad

Time: 9:30 AM / Location: Spencer 151

This body of research explores the cultural lives of Syrian refugees in the Hashemite Kingdom of Jordan. The study seeks to learn: how do Syrian refugees transmit their cultural identities to their children, a generation growing up separated from the social and cultural infrastructure of their home country? The hypothesis stated that refugee communities will, in the absence of familiar cultural structures, reconstruct tribal “kinship” networks that operate informally to reproduce culture for young generations. Interviews with Syrian refugees living in East Amman as well as Mafraq, Northern Badia were conducted in tandem with a survey of residents of Al Za’atari Refugee Camp. Concluding, the researcher finds that while data collected from Al Za’atari Camp and Mafraq support the hypothesis, the community practices among refugees in East Amman do not. The uses of formal versus informal community structures distinguishes the Syrian refugee communities in each of these environments.

In Opposition to the Glass Ceiling: An Analysis of the Performance of S&P 100 Companies with Female CEOs and Gender-Diverse Boards
Killen Cooper
Department of Economics
Faculty Sponsor/Mentor: Dr. Marc St-Pierre

Time: 10:00 AM / Location: Spencer 151

Historically, women have had little to no place in top positions of global companies such as the S&P 100. In the past two decades, there has been small but notable progress in the numbers of female CEOs and females on boards in top companies; the effects of these changes are only now being examined. While I found that increased female board membership had a small negative correlation with productivity in terms of ROE and ROA, the presence of a female CEO was positively correlated with nearly triple the amount of productivity. Firms should take note of the impact of women breaking through the glass ceiling into top positions around the world.
Do Black Lives Matter? Racism within the United States’ Law Enforcement System
Liz Arza
Department of Economics
Faculty Sponsor/Mentor: Dr. Marc St-Pierre

Time: 10:30 AM / Location: Spencer 151

Following the death of Trayvon Martin by the hands of neighborhood watch captain George Zimmerman in February 2012, a black activist movement began in the United States by the name of “Black Lives Matter”, which tries to bring to light the racism against blacks in the United States’ law enforcement system, specifically considering arrest-related deaths. This research paper investigates whether the available data supports the argument posed by the Black Lives Matter movement. To carry out the study, the paper relies on data from NGOs, the FBI’s Uniform Crime Report and the Census Bureau’s population data for the year 2013. The econometric model developed predicts the number of deaths by race by controlling for the probability of being arrested and fixed effects. Answering this question with empirical evidence offers credibility to the movement and could help shift the policy conversation from whether the problem exists, to what should be done to address it.

The Effect of Water Rate Structures on Use
Matson Conrad
Department of Economics
Faculty Sponsor/Mentor: Dr. Marc St-Pierre

Time: 11:00 AM / Location: Spencer 151

Water is our most necessary natural resource. We are using water at an increasing rate which provides an impetus to understand what effects our water use - it is currently inefficiently priced and is leading to its exploitation. The three common water rate structures in the United States are flat rates, uniform volumetric rates, and tiered rates prices. The per unit price of water under an increasing (decreasing) block pricing rate structure increases (decreases) with use, and is often implemented to help water sustainability polices. The effect of water rate structure and price changes on annual domestic water use per capita in major cities across the country was analyzed from 2010 until 2015 while controlling for environmental and demographic trends. To aid policy decisions for water sustainability, the price elasticity of water demand is the ultimate focus of this study.

Testing the Porter Hypothesis: Environmental Regulation and Industry Productivity
Alexandra Willoughby
Department of Economics
Faculty Sponsor/Mentor: Dr. Aaron Elrod

Time: 11:30 AM / Location: Spencer 151

Environmental regulations have traditionally been understood as an encroachment onto firm competitiveness. Stringent standards often require costly renovations that deter firms from welcoming environment friendly production techniques. A series of articles published by Harvard professor Michael Porter formulated an economic hypothesis that challenged these conceptions. Instead, Porter suggests that properly designed regulation instigates innovative thinking, leading to a more productive use of resources which increases environmental efficiency and long run business performance. This paper uses an econometric model to test if Porter’s assertion holds at the industry level. Specifically, I look at how the EPA has affected performance between 1999 and 2013. I use changes in labor productivity as a proxy for business performance.
ABSTRACT B7

The Wunderkammer as Laboratory? Early Modern Museums in Historical Context

Monsters, Marvels and Museums
Department of History
Faculty Sponsor/Mentor: Dr. Kelly Whitmer

Time: 2:15 PM / Location: University Archives and Special Collections

Early museums or Wunderkammern (cabinets of wonder) housed striking collections of marvelous objects. Prized for their rarity, these objects served as starting points for conversations about relations between local and global bodies, the natural and the artificial, the preternatural – and more—during the period (1500-1800). Our class has been studying these early collections as tools and sites of knowledge production. To better understand them, we have built our own Wunderkammer in 3 spaces, or cabinets, located in Archives/Special Collections, Spencer, and Woods Hall. We have enlisted the help of Dr. Brandon Moore’s Biology of Human Reproduction class in designing/producing biological curiosities for the Woods cabinet; they will join us for discussion during Scholarship Sewanee. Our presentation will explore the ordering principles at work in the earliest Wunderkammern using the first museological treatise ever published, Quiccheberg’s *Inscriptiones*, as our muse. It will also involve a tour!

ABSTRACT B8

The Franco-Prussian War: Its Impact on France and Germany, 1870-1914

Emily Murray
Department of History
Faculty Sponsor/Mentor: Dr. Harold Goldberg

Time: 3:05 PM / Location: Spencer 151

The little known Franco-Prussian War served as the crucible that launched World War One and Two. It occurred during a pivotal period for both France and Germany. The war created dramatic cultural changes and new national identities in both countries and warfare was legitimized as a political tool within Europe. This nineteenth century conflict redefined each nation as France transitioned from the Second Empire to the Third Republic and Prussia unified the German states into the German Empire. The Franco-Prussian War laid the foundations of Revanchism which defined German and French relations leading up to World War One. Between 1870 and 1914 both nations addressed what it meant to be ‘French’ or ‘German’ while dealing with the domestic and international impacts of events which stemmed from the Franco-Prussian War such as the Paris Commune, the Boulanger Crisis, the Dreyfus Affair, and the annexation of Alsace and Lorraine.

ABSTRACT B9

“Worthy of th’heroic dead”: Local Gratitude and National Mourning in England’s Thankful Villages

David Prehn
Department of History
Faculty Sponsor/Mentor: Dr. Charles Perry

Time: 3:25 PM / Location: Spencer 151

Following the Great War, communities across Britain were attempting to articulate grief: personal mourning and public expression converged in commemoration. This project, however, examines the articulation of thanksgiving — it introduces to the scholarship Britain’s “thankful villages,” the 51 localities that suffered zero losses in the War. How did these seemingly anomalous communities react to the War in a nation fully engaged in and transformed by grief? The project discusses the thankful villages’ commemorative decisions by examining both the national trends used by the thankful and also the highly localized nature of the process. With careful attention to the existing scholarship, British newspapers and the text of the memorials themselves served as the project’s principal evidence.
**ABSTRACT B10**

“Wonderful is the Strength and Force of Prayer”: The Evolution of Tudor Primers

William Stokes  
Department of History  
Faculty Sponsor/Mentor: Dr. Charles Perry

Time: 3:45 PM / Location: Spencer 151

This thesis looks at the nature of primers, or the Book of Hours, during the later Tudor period. Primers are examined from the late Medieval world, during the reign of Mary Tudor and the reign of Elizabeth Tudor. A close analysis of the changes that these books underwent through the reigns of several monarchs during the British Reformations yields a better view of the fluid and dynamic process of religious reform in 16th century England. By comparing the contents of these primers, this thesis will show that there was much tension between the prescribed English religion and popular religion. The Catholic Marian primers contain elements of Protestantism while the Protestant Elizabethan primers retain many appendages of Catholicism. Both sets of books, however, demonstrate the unique nature of the English church as it was evolving apart from other continental churches during the 16th century.

**ABSTRACT B11**

A Trade of Horrors: Human Trafficking in Russia and Armenia

Taylor Yost  
Department of International and Global Studies  
Faculty Sponsor/Mentor: Primary Advisor: Dr. Elizabeth Skomp and Dr. Mila Dragojevic

Time: 4:05 PM / Location: Spencer 151

The prohibition of slavery is accepted as a peremptory norm - a norm of the highest level - yet forms of slavery still exist. Human trafficking is a global phenomenon that is considered a modern form of slavery. The problem of human trafficking is ubiquitous, but post-Soviet countries became a target after the Soviet Union collapsed. While research has found many factors that make a country susceptible to increased trafficking in humans, little research has explored the factors that contributed to countries’ alleviation of the trafficking problem. By examining Russia, a country infamous for its trafficking problem, and Armenia, a country that has drastically improved its trafficking problem, I expect to find certain cultural and political factors that have contributed to each country’s respective trafficking levels. I hypothesize that these factors include gender discrimination, civil society activity and national identity.

**ABSTRACT B12**

The United Nations and the Challenge of Humanitarian Intervention: A Case Study Approach

Abby Felts  
Department of International and Global Studies  
Faculty Sponsor/Mentor: Dr. Rodelio Manacsa

Time: 4:25 PM / Location: Spencer 151

Based on the United Nations Security Council’s disparate responses to relatively similar acts of regime violence and humanitarian crises since the early 1990s, it seems that the decision to use force to protect civilians is influenced by factors other than the substantive act of violence. In order to analyze the paradoxical nature of the UN’s decisions to implement force under a humanitarian justification, I will examine the four cases of Sierra Leone, Darfur, Libya, and Syria, and analyze three key factors: the influence of powerful states’ strong political will and military capability in motivating humanitarian intervention, the consequence of regional organizational involvement in the crisis, and the institutional constraints within the United Nations system.
**ABSTRACT C1**

**Ant Diversity in the Coffee Agroecosystems in the Central Plateau of Haiti**

Geanina Fripp  
Department of Biology  
Faculty Sponsor/Mentor: Dr. Deborah McGrath

Time: 8:30 AM / Location: Spencer 164

Many studies have investigated the effects of the transformation of coffee agroecosystems from shaded to unshaded systems on biodiversity. Sun coffee systems have been correlated with a decrease in biodiversity while shade coffee systems harbor higher biodiversity. However, coffee agroecosystems in the Central Plateau of Haiti are undergoing transformation from unshaded to shaded systems. In this study we examined the ant community composition of 15 farms in order to track the changes in environmental conditions and to understand the potential for ant species as biological control agents on the farms. We recorded 21 species of ants from 17 genera. Three species, Solenopsis geminata, Tapinoma melanocephalum, and Wasmannia auropunctata may serve as important agents of biological control on the farms as previous studies have demonstrated their ability to reduce coffee pests. The presence of these species on the farms may promote coffee growth and reduce the need for pesticides.

**ABSTRACT C2**

**Interactive Effects of Temperature and Glyphosate Concentration on the Behavior of Blue Ridge Two-Lined Salamanders, Eurycea wilderae**

Jaina Gandhi  
Department of Biology  
Faculty Sponsor/Mentor: Dr. Kristen Cecala

Time: 8:50 AM / Location: Spencer 164

The objective of the present study was to evaluate the interactive effects of stream temperatures and environmentally relevant glyphosate-based herbicide concentrations on movement and anti-predator behaviors of larval Eurycea wilderae. Individuals were exposed to one of four environmentally relevant glyphosate concentrations at either ambient or elevated water temperatures. Larvae made shorter, more frequent movements and demonstrated reduced burst distance at higher concentrations. Low concentrations sometimes had stronger effects than higher concentrations, suggesting that safety tests conducted only at high glyphosate concentrations might overlook important effects on salamander behavior. We also found that the maximum effect of glyphosate on burst distance occurred at 2 hours of exposure and subsequently declined. These data demonstrate that sublethal effects of glyphosate-based herbicides on natural behaviors of amphibians can occur with short-term exposure to low concentrations.

**ABSTRACT C3**

**Exome Sequencing in Tourette Syndrome and Genetic Screening in a C. elegans Model of Machado Joseph Disease**

Petra Richer  
Department of Biology, Sewanee-at-Yale Directed Research Program  
Faculty Sponsor/Mentor: Dr. Elise Kikis and Dr. Thomas Fernandez

Time: 9:10 AM / Location: Spencer 164

Gene discovery has played an integral role in elucidating mechanisms underlying neurological disorders. Sequencing studies have identified variation between cohorts to implicate genes in disorders like Tourette syndrome (TS), while neurodegenerative disorders have been modeled in C. elegans, where RNA interference (RNAi) screens have identified regulators of polyglutamine (polyQ) aggregation. Here, I describe an exome sequencing study exploring de novo genetic variation in TS. Implicated genes were assessed for their functional roles and expression and were found to be vital for a variety of cellular processes and had distinct spatiotemporal localization. In a separate project,
an ethyl methanesulfonate mutagenesis screen was performed to identify genes that suppress the aggregation of the ataxin-3 protein in which a polyQ expansion causes Machado Joseph disease. C. elegans expressing the human ataxin-3 protein were mutagenized and are currently being characterized.

ABSTRACT C4

To Flee or Not to Flee: How Terrestrial Salamanders Respond to a Simulated Attack
Margaret Bliss
Department of Biology
Faculty Sponsor/Mentor: Dr. Kristen Cecala

Time: 9:30 AM / Location: Spencer 164

Animals avoid predation in order to survive, which can be costly. For example, when individuals forgo important activities like foraging and mating, they can experience decreased fitness. Tail autotomy, the voluntary shedding of the tail to escape predation, results in immediate survival, but salamanders experience negative physiological effects. Previous studies have shown that autotomized individuals may compensate for these costs through antipredator behaviors and physiological strategies. We simulated tail autotomy then examined escape distance, exploratory movement, refuge use, temperature preference, and feeding rate as antipredator and compensatory responses in order to evaluate behavioral changes. Following attack, individuals escaped further, explored more, and preferred warmer temperatures. We found no evidence for increased feeding rates or refuge use. Our results show that salamanders adjust their antipredator and compensatory behaviors following a predator attack.

ABSTRACT C5

Elevated Temperatures Alter Individual Performance and Competitive Outcomes in Desmognathine Salamanders
Lindsey Liles
Department of Biology
Faculty Sponsor/Mentor: Dr. Kristen Cecala

Time: 10:10 AM / Location: Spencer 164

Climate change is directly affecting wildlife and plant performance and distributions, but the mechanisms behind these shifts are less well understood. For ectothermic animals, climate changes that alter behaviors and interactions with other species may accelerate or decelerate population declines. We evaluated competition between two species of stream salamander at ambient and elevated temperatures in stream mesocosms. At ambient temperatures, the widespread and larger species outcompeted the smaller more narrowly distributed species, but at elevated temperatures, this effect was diminished. In situ, the larger species also excludes the smaller species from the stream center. Growth results from this study suggest that salamanders at elevated temperatures prioritize addition of mass rather than length that may be a result of stress. Ultimately, elevated temperatures may impact salamander physiology and community interactions.

ABSTRACT C6

HDAC-Mediated Transcriptional Control of GIMAP7
Jacob Zalewski
Department of Biology
Faculty Sponsor/Mentor: Dr. Alyssa Summers

Time: 10:30 AM / Location: Spencer 164

HDACs are key regulators of cell proliferation, cell-cycle progression, and apoptosis. Expression of HDACs is increased in cancer, and the use of HDAC inhibitors (HDIs) in the treatment of cancers is becoming increasingly
common. GIMAPs are required for the development of T-cells in the thymus, and have altered function/expression in T-cell lymphomas. Developing a clearer understanding of the effects of HDAC activity on GIMAP expression is important for improving current treatments. Here, we investigated the relationship between HDAC3 and GIMAP7 expression/promoter activity in murine fibroblasts and T-cell lymphoma cells treated with HDI. Luciferase Assays, qRT-PCR, and RNA-sequencing showed significant effects of HDAC3 inhibition and up-regulation on GIMAP7 expression/promoter activity. Our findings suggest HDAC3 transcriptional control of GIMAP7 and identify a possible target for therapeutic HDI treatment.

**ABSTRACT C7**

*Environmental Correlates and Fitness Consequences of a Flower Color Polymorphism in Boechera Stricta*

Ansley McDurmon  
Department of Biology  
Faculty Sponsor/Mentor: Dr. Deborah McGrath and Dr. Jill Anderson

Time: 10:50 AM  / Location: Spencer 164

Anthocyanin is an energetically expensive flavonoid that provides purple coloration for many angiosperms, yet debate surrounding pressures selecting for anthocyanin production largely studies pollinator preference or a single environmental pressures acting upon plants. To understand the interaction between environmental correlates and flower color, this study explores a variety of potential environmental correlates of flower color in the self-pollinating brassicaceae, Boechera stricta. Flower color is also compared with the plant’s mature silique length to determine potential fitness costs or benefits of anthocyanin production. In plants of colored flowers, herbivory decreases by 9.029±1.929%. In addition, we found significant evidence of an association between percent herbivory and silique length, indicating that for each 1% increase in percent herbivory silique length decreased by 2.94±0.80mm. Herbivores may exert a selective pressure to maintain flower color polymorphisms.

**ABSTRACT C8**

*Stream Salamander Distribution Patterns of the southern Cumberland Plateau*

Philip Gould  
Department of Biology  
Faculty Sponsor/Mentor: Dr. Kristen Cecala

Time: 11:10 AM  / Location: Spencer 164

Geophysical and climate conditions are mechanisms in the distribution of organisms across landscapes. Having knowledge of species responses to these conditions is vital to their conservation. Plethodontid salamanders are key members of montane trophic cascades, thus understanding their distribution is important for the health of entire ecosystems. We surveyed 50 streams on the southern Cumberland Plateau in Tennessee. Our objective was to determine what mechanisms best predicted salamander occupancy. Occupancy models included percent forest cover, elevation, and watershed size. Our results suggest that while responses were largely species specific, geographic features had a greater influence than forest cover, differing from studies conducted elsewhere. Our findings challenge the notion that species distribution patterns are homogeneous across their ranges and suggest that geographic distinctions may play a larger role in species occupancy than previously realized.
ABSTRACT C9

Crowdsourcing: A New Culturally Relevant Measure of Assertiveness
Jemima Senoga
Department of Psychology
Faculty Sponsor/Mentor: Dr. Al Bardi

Time: 2:15 PM / Location: Spencer 164

The Rathus Assertiveness Scale (RAS, Rathus, 1973) is a widely used measure of assertiveness but does not measure the construct as it manifests in differing cultures. The purpose of this study is to use crowdsourced data from African-Americans and Latino/a Americans to conduct reliability and validity analyses to build a new, more culturally inclusive measure of assertiveness. We created 98 items using focus group data from African-American, Latino/a American, and female participants regarding aggression and assertiveness within their communities. These items, the Marlowe-Crowne Social Desirability Scale (Crowne & Marlowe, 1960), the RAS, and the Expanded Multi-group Ethnic Identity Measure (EMEIM, Gaines, Marelich, Bunce, Robertson, & Wright, 2013) were administered to 208 Latino/a Americans and 207 African Americans via a crowdsourcing platform. Psychometrics of the resultant measure will be discussed.

ABSTRACT C10

Early Experience with Prehospital TXA: Protocol Appropriately Identifies Trauma Patients Requiring Transfusion and Reduces Time to TXA Administration
Neal Bartl
Department of Surgery, Carolinas Medical Center
Faculty Sponsor/Mentor: Dr. Bethel Seballos

Time: 2:35 PM / Location: Spencer 164

Tranexamic acid (TXA) is an anti-fibrinolysis agent. It is a lysine analog and inhibits the activation of plasmin by binding to lysine residues on plasminogen. Recently, new considerations have been given to its use in trauma situations. Several studies have shown that early administration of TXA can reduce death due to bleeding, but late administration may cause deleterious effects. This potential time constraint on TXA administration makes it ideal for use in the prehospital arena. Our study assessed the efficacy of a prehospital TXA protocol. A total of 31 patients were given TXA by the prehospital team while 71 were given TXA upon arrival to the trauma center. We found that the prehospital TXA protocol resulted in a significant reduction in drug administration delays. The mean time to administration was 93 minutes in the prehospital group in comparison to 150 minutes in the hospital-administered TXA group. This suggests that TXA is well-suited for the prehospital environment.

ABSTRACT C11

Colluvial Mass Movements below the Bluff Line: Using LiDAR to Survey Domain Landslides
Daniel Fortner
Department of Forestry and Geology
Faculty Sponsor/Mentor: Dr. Kevin Hobbs and Dr. Steve Shaver

Time: 2:55 PM / Location: Spencer 164

Mass movements, particularly rotational landslides, are a major mechanism by which Southern Appalachian slopes erode. Importantly, the advent of airborne Light Detection and Ranging (LiDAR), which can be used to generate high-resolution digital elevation models (HRDEMs) and to rapidly visualize forest-floor topography, presents a possible mechanism for greatly enhancing the efficiency of local mass movement studies. Our study, which uses LiDAR and ground-truthing to survey approximately 50% of Domain slopes, represents the only recent inventory of Sewanee-area landslides. By comparing DEM and field findings for more than a dozen mass movements, including several
previously undocumented rotational landslides, we demonstrate that LiDAR rivals and, especially for decades-old slides, even exceeds field surveying as a tool for time-effectively locating and measuring colluvial mass movements. We also find LiDAR effective for remotely generating accurate landslide volume estimates. In addition, by performing dendrochronology within slides, we propose a general mechanism by which local slides back-propagate and evolve over time. We find a strong tendency for slides to initiate in colluvium derived at least partially from carbonate-rich bedrock (rather than exclusively from sandstone), and we show that slides are especially likely to occur on slopes steeper than 20°. We further find that anthropogenic influences (roads, drainage culverts, logging) disproportionately encourage landsliding, and we propose that 1) colluvium saturation level, 2) slope inclination, 3) colluvium textural composition, and 4) anthropogenic slope destabilization represent the most important local controls on slope susceptibility. Finally, we discuss the advantages and limitations of LiDAR with regard to false-positive and false-negative landslide identification.

**ABSTRACT C12**

**Genome-Wide Analysis of HDAC3 Regulated Target Genes in Developing T-cells**

David Pride  
Department of Biology  
Faculty Sponsor/Mentor: Dr. Alyssa Summers

Time: 3:15 PM  /  Location: Spencer 164

The development of T-lymphocytes proceeds through a highly regulated process dependent on discrete changes in gene expression and chromatin state. Histone deacetylase 3 (HDAC3) is an enzyme that contributes to the regulation of gene expression, chromatin architecture, and genome stability, and its aberrant expression has been seen in hematological malignancies and solid cancers. HDAC inhibitor (HDI) treatment has proved efficacious in the treatment of hematological malignancies, however the mechanisms of this efficacy remain insufficiently characterized. Previous work in our lab generated a Lck-Cre mediated conditional HDAC3 knockout model in murine thymocytes, and demonstrated that HDAC3 is required for progression through the CD4/CD8 double-positive stages of development. In order to elucidate specific gene regions involved in this transition, regulated by HDAC3, we seek to use chIP-seq to assess global acetylation levels within double positive 1 (DP1) thymocytes from HDAC3 KO mice.

**ABSTRACT C13**

**Does Riparian Disturbance Alter Anti-Predator Behaviors?**

Amanda Liford  
Department of Biology  
Faculty Sponsor/Mentor: Dr. Kristen Cecala

Time: 3:35 PM  /  Location: Spencer 164

Ecological traps occur when a species makes maladaptive habitat selection decisions. Stream amphibians are known to alter their habitat selection in response to abiotic cues associated with riparian clearing. To evaluate if deforested habitats create ecological traps, we studied habitat selection behavior of larval Desmognathus quadramaculatus from different environments when given conflicting environmental cues. We anticipated that individuals from deforested reaches would make adaptive anti-predator choices when presented with well-lit habitat whereas individuals from forested reaches would select shaded habitat closer to a predator. We found that habitat origin, light, and predator presence all influenced habitat selection. Although habitat origin did alter habitat selection, all observed individuals adaptively avoided a predator despite the presence of cues associated with human-modified habitats.
In January of 2015, the University of the South tightened its rules regarding the use of common source ‘punch’ on Sewanee campus. The University announced that any Greek organization that was caught with punch would be suspended from campus for a semester, and the students involved in making it would likely suffer similar repercussions. This policy change created much discussion and debate among students. The policy was aimed to curb some problems associated with drinking and the drinking culture at Sewanee, such as sexual assault, drugging, and alcohol poisoning. At the same time that this topic was being discussed on campus, the Office of Community Engagement and the Collaborative for Southern Appalachian and Place-Based Studies developed a relationship with FrameWorks Institute, whose mission is to study the frames underlying such discussions. The mission of the FrameWorks Institute is to “design, conduct and publish communications research to prepare nonprofit organizations to expand their constituency base, to build public will, and to further public understanding of specific social issues.” The institute begins tackling a problem by understanding the way in which a certain population thinks about it.

The hymen is potentially the most misunderstood and dangerous part of anatomy in the human body. This thesis focused on the hymen myth, the false idea that having an intact hymen is proof of a girl’s virginity. This myth will be debunked and traced across history, through Ancient Greece, Ancient Rome, early Jewish culture and religion, and Christian gospels, to modern day implications in medicine, sexual education, and modern American culture. The hymen myth affects everyone in some form, having the power to kill over 5,000 women every year. The only way to combat this dangerous myth is through education and consciousness raising.

Samuel Beckett begins his 1930 essay Proust: “The Proustian equation is never simple.” The French novelist Marcel Proust's In Search of Lost Time heavily influenced Beckett, whose own conception of time is similarly complex. Beckett’s essay delineates his understanding of Proust’s work and propounds a philosophy deeply rooted in solipsism, as he writes, “We are alone. We cannot know and we cannot be known.” Beckett applies this philosophy to his absurdist plays, notably Krapp’s Last Tape. The one-act, one-man play dives into the mind of Krapp, an aged man revisiting a series of tapes recorded earlier in his life. Krapp, whose Proustian memories belie self-understanding rather than expound it, exemplifies Beckett’s view of human existence. Characterized by harsh and painful extremes, life is, for Beckett, ultimately absurd. In this play, Beckett expands upon this idea, and through Krapp’s haunting, dualistic solipsism, ultimately denies the existence of a rational inner reality.
**ABSTRACT D4**

The Corporeal Unincorporated: Pathetic Disembodiment in Kazuo Ishiguro’s “The Remains of the Day”  
Sally Burgess  
Department of English  
Faculty Sponsor/Mentor: Dr. Lauryl Tucker

Time: 10:30 AM / Location: Spencer 262

This presentation explores the implications of a division between the physical body and the mind’s sympathetic ability, as written into the text of British author Kazuo Ishiguro’s novel, The Remains of the Day (1989). By examining salient passages in which the novel’s narrator, Stevens, fails to acknowledge the role of his body in the fulfillment of his actions and his thoughts—or even denies his own agency outright, I argue that the narrator imitates all-too-effectively the intangible restraint for which he expresses admiration in the British vista. In seeking to embody a set of abstract values associated with a lack of emotional engagement, Stevens disembodies himself from the human form he occupies and from the associated pathetic capabilities of a metaphorical heart and soul.

**ABSTRACT D5**

Ubiquitous Uncertainty: Langston Hughes and the Power of Folk Blues  
Zack Loehle  
Department of English  
Faculty Sponsor/Mentor: Dr. Virginia Craighill

Time: 11:00 AM / Location: Spencer 262

Blues music forms the foundation of much of American popular culture, but for many years was rejected by middle- and upper-class whites and African-Americans on racist and classist grounds. The poet Langston Hughes utilized blues structures, content, and language in much of his poetry, an embrace of lower-class African-American culture that many contemporaries found distasteful. Where blues music puts the inescapability of day-to-day injustice in an ironic or melodramatic context through music, Hughes removed that musical backing, creating poems that depict a stark and heartbreaking reality. In this paper, I argue that by using these “low” or “folk” types of music as the basis for much of his work, Hughes embraced the richness of African-American culture and argued for its value in the context of high art.

**ABSTRACT D6**

A Summer in Haiti -- Photographs as Tools for Community Development  
Zamni Foto Research – Haiti  
Department of Art and Art History  
Faculty Sponsor/Mentor: Dr. Pradip Malde

Time: 11:30 AM / Location: Spencer 262

The Zanmi Foto Project seeks to formulate ways in which communities become more resilient through photography and community discussion. The approach is driven by the assumption that habitual discussion builds relationships and narratives, which, in turn, make for resilient communities. Over the summer of 2015 three Sewanee Students and mentor Professor Pradip Malde continued to work on the project and evaluate its affects on the communities that we are working on. This presentation is the three students, Mansell Ambrose, Mary Margret Johnson, and Hunter Swenson showing the work they did in Haiti in the Zanmi Foto project.
ABSTRACT 1

Soil Legacies at Abandoned Home and Agricultural Sites on the Domain
Lily Castle Tidwell
Department of Earth and Environmental Systems
Faculty Sponsor/Mentor: Dr. Ken Smith

Sewanee’s Domain has multiple abandoned home sites that were occupied by settlers and were likely used by Native Americans for various purposes. We investigated the soil legacies of long-term human occupation by examining soil chemical properties and through the identification and measurement of the trees that now occupy the three sites (in compartments 20, 40 and 50). Preliminary data indicate “hot-spots” of heavy metals, carbon concentrations, and nitrogen in surface soils near the home footprints. Our tree surveys found that almost 50% of tree cover at the sites consisted of species typically found on limestone derived soils in our coves. Two of the sites had soil test pits which contained prehistoric Native American artifacts, and all three sites had charcoal and historic artifacts in numerous test pits.

ABSTRACT 2

Tree Thinning, Prescribed Fire and Oak Regeneration on the Domain
Victoria Schnaufer
Department of Earth and Environmental Systems
Faculty Sponsor/Mentor: Dr. Ken Smith

Prior studies on the Cumberland Plateau indicated that lowering tree basal area in combination with multiple prescribed fires has led to an increase in the density of oak seedlings on upland plateau sites. Starting 2010, three stands in Compartments 46, 20 and 8 were thinned and exposed to two prescribed fires. Pre-treatment basal areas and oak seedling densities did not differ among the sites. Post-treatment, oak seedlings densities significantly increased in compartments 46 and 20, while staying the same at compartment 8. Post-treatment, tree seedling and grass cover increased at all the sites. Logging technology, fire intensity and spread, and mast years all seemed to influence regeneration rates at all three sites.

ABSTRACT 3

Sewanee’s Overtopped Oak Study: 38 Years of Growth and Carbon Sequestration
Connor Winkler, Rutledge Schock
Department of Earth and Environmental Systems
Faculty Sponsor/Mentor: Dr. Ken Smith

In 1977, US Forest Service personnel established a long-term white oak (Quercus alba) study that examined how trees ranging in age from 10-100 years would respond to release. The study site, in Compartment 38, experienced a large basal area reduction following a harvest in the winter of 1977, and 104 white oak trees from the mid-story were left standing and measured for age, height, DBH, and volume. In 2016, we relocated and inventoried all the living trees. Preliminary analyses indicates that of the 95 living trees, average DBH was 12.9 inches (32.7cm), average height 72 feet (22 m), and we found an average of 8 epicormic sprouts per stem. Average volume ranged around 30 cubic feet per tree. Differences between initial standing volumes and 38 year volumes will be used to estimate carbon sequestration rates by these trees over time.
Food Explorers 2: Family Edition
Liza Robinson, Linden Thayer
Department of Biology
Faculty Sponsor/Mentor: Dr. Alyssa Summers and Dr. Alice Ammerman

As childhood obesity and diabetes rates increase, fruit, vegetable and sugary beverage consumption are major factors. This NC based study focused on increasing exposure and consumption of fruits and vegetables while decreasing the amount of sugary drinks drunk. Using text messaging, social media, and classroom based components, the program was tested over 12 weeks with randomly chosen 4th and 5th grade families at a public charter school. Results were recorded from in-depth interviews, focus groups, and surveys. They include an overall positive experience with increased parental self-efficacy of vegetable consumption and accessibility to a variety of produce, and decreased purchase of sugary drinks. The technology and school based methods overcame many of the barriers with a low-resource rural population and could be applied to a larger group to understand the effects on family behavior and child health.

The Effects of Different Habitat Covariates on Stream Dwelling Salamanders
Saunders Drukker, Philip Gould, Ben McKenzie
Department of Biology
Faculty Sponsor/Mentor: Dr. Kristen Cecala

The relative body conditions of multiple species of stream dwelling salamanders, D. conanti, E. wilderae, and P. ruber, were recorded over three months at 50 random sites across the Cumberland Plateau. The body conditions of these salamanders were then compared across various environmental habitat factors of each stream including; latitude, watershed size, percent forest cover of watershed, stream aspect and stream slope. These factors can be used to assess the overall habitat quality, and then to see how stream quality affects salamander health. For D. conanti the best predictive habitat factors were watershed size and stream aspect. Watershed size was positively correlated to salamander body condition. Streams with more southerly aspects produced healthier individuals as well. Northern aspects and watersheds with more forest cover were associated with better body condition for E. wilderae. For P. ruber both elevation and latitude were positively correlated with body condition.

Insights from De Novo Genetic Variation in Tourette Syndrome
Petra Richer, Thomas V. Fernandez, MD
Department of Psychiatry, Yale University School of Medicine
Faculty Sponsor/Mentor: Dr. Thomas V. Fernandez

Tourette syndrome (TS) is a neuropsychiatric disorder characterized by combinations of motor and vocal tics that persist for longer than one year. In the general population, 0.5-0.7% of people are affected by TS at some point in their lives. The median age of onset among children is 6 years, and tics reach the peak of their severity at approximately 10.6 ± 2.6 years of age. Twin studies have found a concordance rate of 53% in monozygotic and 8% in dizygotic twins, indicating a substantial genetic component to the disease. Current treatment options for TS vary in effectiveness among individuals and include behavioral therapy and various medications for controlling disruptive tics. Remaining questions about TS pathophysiology and a need for new and improved treatment options has prompted the study of genetic causes that underlie the disease in the hopes of identifying novel therapeutic targets and increasing our understanding of this complex disorder.
My paper will focus on the relationship between gender, authoritarianism, and support for invasive domestic policies enacted post-9/11 and in response to the War on Terror. I hypothesize that there is a relationship between these variables, and that it correlates with political socialization and cultural gender roles. The domestic responses to the threat of terrorist attacks were authoritarian in nature: they restricted civil liberties and emphasized obeying authority figures. Women are socialized to avoid violence, whereas men are taught to solve their problems directly rather than through communication, and tend to be conservative; this may lead men to be more easily influenced by authoritarian ideology. My study will analyze responses to the relevant ANES questions and try to identify whether gender can predict authoritarianism, and whether the two combined predict with greater accuracy the support of the Bush administration’s policies post-9/11.

Tourette Syndrome is a complex neuropsychiatric disorder characterized by pathognomic motor and vocal tics, as well as by sensory and cognitive symptoms and its pathophysiology is not well understood. Recently, a high-penetrance mutation in histidine decarboxylase (Hdc), a key enzyme in the biosynthesis of Histamine (HA), was implicated as a rare cause of TS. Hdc knockout mice recapitulate core phenomenology of TS. The finding that the tic-like stereotypes observed in HDC knockout mice were mitigated by HA infusion into the brain has focused attention on disruption of brain HA as a potential causative factor in neuropsychiatric disease especially TS. To investigate the cause of the observed effects, we used cre-infused DREADDs to reversibly inactivate histaminergic neurons chemogenetically; importantly, peripheral sources of HA are unperturbed by this manipulation, and brain development is normal.

p53 is a transcription factor induced by stress that promotes cell cycle arrest, apoptosis, and senescence. The p53 tumor suppressor provides a powerful intrinsic defense against cancer and mutations in the TP53 gene contribute actively to cancer development through gain-of-function (GOF) activities. This may involve enhancement of invasive properties, attenuation of apoptosis, and increased genomic instability. NMDARs regulate mTOR signaling activity; their inappropriate expression in several human cancer cell lines represents a potential therapeutic avenue to control tumor development and progression. Conflicting reports of the role of NMDARs in tumor progression suggest that determining the effect of NMDAR on specific tumor cell lines is a critical step in developing potential NMDAR chemotherapeutics. We study these effects on mutant p53 based breast cancer cells by inhibiting NMDAR activity in three mutant p53 breast cancer cell lines.
**ABSTRACT 10**

*You Are What You Watch: Short-Term Effects of Media Exposure*

Jama Jacks, Woodli Krutek, Anne-Stuart Bell, Natalie Van-Why  
Department of Psychology  
Faculty Sponsor/Mentor: Dr. Jordan Troisi

Our study examined the short-term effects of sexist media exposure on sexist behavior and thinking. Undergraduates from a small liberal arts university were randomly assigned to either a control group, which viewed neutral video clips, or an experimental group, which was exposed to sexist video clips. Between each clip, distractor videos of animals were shown to both groups. After viewing the videos, each participant completed an aggression word completion task, the Modern and Old-Fashioned Sexism Scales, and the Ambivalent Sexism Inventory. We ran statistical analyses on gender and exposure group on sexism and aggressive word responses. We expected to find two main effects: men would have higher aggression and sexism scores than women and those exposed would have higher scores than those not exposed. We also predicted an interaction between gender and exposure: exposure would lead to an increase in men’s sexism and aggression scores, but exposure would not influence women’s scores.

**ABSTRACT 11**

*New Routes to Photocrosslinking Poly(acrylic acid)*

Dannielle Hendon, Anne Walker  
Department of Chemical Engineering, Case Western Reserve University  
Faculty Sponsor/Mentor: Dr. Gary Wnek

Polyacrylic acid (PAA) is a polyelectrolyte with a number of uses due to its ability to swell in water. Crosslinking PAA is critical in making the material water insoluble. Crosslink density can be modified to control swelling behavior, providing significant improvement to the material’s range of applications. Previously used methods of crosslinking include a water-sensitive thermal technique using ethylene glycol and a thermally-initiated method using N,N’-methylenbisacrylamide. Unfortunately, the methods listed above are fairly time, energy, and material-intensive. In order to improve the production methods of crosslinked PAA, photocrosslinking methods were investigated. The aim was to remove the time-intensive thermal crosslinking steps and replace them with quick photoinitiated reactions. One method used ammonium persulfate and pentaerythritol triacrylate mixed with commercial PAA. The other method used two benzophenone monomers to produce a photocrosslinkable copolymer.

**ABSTRACT 12**

*Synthesis of a New Indazole and Examination of its Metal Complexation Chemistry*

Oksana Creech and Emily Gay  
Department of Chemistry  
Faculty Sponsor/Mentor: Dr. Robert E. Bachman

The anti-cancer drug KP1019 contains a ruthenium center bound by two indazole fragments. While this drug has been shown to be effective, little is known about its mechanism of action. In order to develop structure function relationships based on ligand variation, we are interested in preparing a range of indazole derivatives capable of chelating the metal atom. In this poster we will present our adaptation of a method from the Chemistry Department at Iowa State University for the synthesis of indazole to the preparation of 3-(2′-pyridine)indazole and our initial study of the metal complexation chemistry of this new ligand.

**ABSTRACT 13**

*Beyond Risk Factors: An Investigation of Attributes Contributing to Scam Compliance*  
Mary Gray Stolz, Elizabeth Taylor, Sherry Hamby  
Department of Psychology
Objective: Current research on scam compliance focuses on personal attributes of victims, yet is limited in its representation of factors that aid in scam compliance. Our study explores this limitation by examining challenges and features of legitimate solicitations versus malicious scams. Methods: A sample of 65 participants from the rural Southeast participated in focus groups on technology use and digital privacy. Results: Participants claimed the difficulty in detecting scams depends on the source (scammer's physical appearance), content (emotion-eliciting content), and form of the scam. Online scams were particularly difficult to detect due to technology's ability to mask deception. Conclusions: Current literature on scam compliance focuses on individual risk factors and subsequently does not account for all scam victims. By analyzing scams themselves, this study not only shifts the blame away from victim characteristics, but also adds a new perspective on scam compliance.

ABSTRACT 14
Can Spirituality Help You Move? Exploring the Impact of Spirituality on Residential Mobility, Well-Being, and Mental Health Outcomes
Matthew Purvis, Elizabeth Taylor, Sherry Hamby
Department of Psychology
Faculty Sponsor/Mentor: Dr. Sherry Hamby

Objective: In a fluid society, mobility is more relevant than ever. Past research, while neglecting mediating factors, shows that mobility is associated with poor health, lower well-being, and mental health issues. We studied the impact of religion and social support on well-being and mental health of mobile individuals. Method: 1331 rural Southeastern individuals from a larger study completed a survey with a range of constructs. Results: Religion and social support are associated with well-being; religion mediates the relationship of mobility and well-being; mobility and social support are associated with mental health; age mediates the relationship of mobility and mental health. Conclusions: Our results suggest religion may help cope with issues related to moving. Also, as age increases, the risk for poor mental health linked with mobility decreases. Methods that focus on religion and social support may aid mobile at-risk youth, however, more research is needed in the clinical context.

ABSTRACT 15
Synthesis and Characterization of Heteroleptic Metal-acetylacetonate Complexes with Substituted Bipyridine Ligands.
Sarah Moats, Leslie Leiva
Department of Chemistry
Faculty Sponsor/Mentor: Dr. Robert Bachman

[Meta]lic(acac), complexes are a well studied class of inorganic chromophores due to their use in a wide range of applications, including catalysts for organic syntheses, components for water treatment, glass coatings, and solar dyes. However, heteroleptic systems with non-acac ligands substituted for one or more of the acac ligands are much less common. In order to study ligand-substituted systems, we have reinvestigated a synthesis of [Co(acac),2(NO2),2], first reported by Bailar and Boucher, as well as their method for producing heteroleptic systems from this complex in order to prepare complexes of the general formula [Co(acac),A]+. These complexes will serve as models for the future study of this class of chromophores in the preparation of new octahedral metal-containing liquid crystalline materials as well as new organic-inorganic conjugate solar dyes.

ABSTRACT 16
Size Characterization and Solubility Examination of Monolayer-Protected Quantum Dots
Veronica Gordillo-Herrejon, Emily A. Shriner, Sonia C. Francione, William L. F. Wright
Department of Chemistry
Water-soluble, monolayer-protected quantum dots (QDs) were synthesized using several water-soluble thiols and alternative metal salts (e.g., cadmium acetate, zinc sulfate). QDs were synthesized at temperatures as low as -55 °C in attempts to control the growth of the nanoparticles. The optical properties of QD solutions were characterized using UV-visible and fluorescence spectroscopies. The hydrodynamic radius of the QDs was determined using pulsed field gradient (PFG) NMR. The diffusion coefficient of the nanoparticles, in concert with a small reference molecule, was determined using PFG-NMR. Subsequently, the size of the nanoparticles was calculated using a modified version of the Stokes-Einstein equation. Size-exclusion chromatography (SEC) was employed in attempts to purify and separate the QDs by size. Also, the solubility and spectral properties of the QDs in different solvents (i.e., water, methanol, and ethanol) was studied.

**ABSTRACT 17**

**How do Rising Stream Temperatures Change Interspecific interactions in an Appalachian Stream Salamander Community?**

Mary Lou Hoffacker, Shawna Mitchell, Kristen Cecala, Josh Ennen, Jon Davenport  
Department of Biology  
Faculty Sponsor/Mentor: Dr. Kristen Cecala

Climate change is predicted to favor smaller individuals suggesting that communities with size-dependent relationships may change in composition. The negative effects of climate change on Appalachian salamanders may be exacerbated by shifting outcomes of interspecific competition. Our objectives were to evaluate the interactive effects of increased stream temperatures and interspecific competition on growth and behavior of salamanders in stream mesocosms. Interspecies competition did not affect stream salamander growth, but salamanders housed at warmer temperatures gained less mass than those at ambient temperature. At warm temperatures, our focal species spent 20% more time cohabitating refuge with a competitor than at ambient temperature or with a conspecific. Although we did not find evidence of competition among the two guild members, shifts in behavior at warmer temperatures suggest that climate change may alter the ecology of stream salamander communities.

**ABSTRACT 18**

**A Comparison of Colobus angolensis palliatus Use vs. Availability in the Sagara Village Forest and Mazumbai Forest Reserve, West Usambara Mountains, Tanzania**

Mary Carlton Murphy  
Department of Ecology and Biodiversity  
Independent Study Project for SIT study abroad program Tanzania: Wildlife Conservation and Political Ecology  
Faculty Sponsor/Mentor: Dr. Reece Matthews and Dr. Oscar Paschal

Tanzania’s Eastern Arc Mountain Range is a tropical, biologically diverse habitat experiencing increasing anthropogenic disturbance. This study observed the habitat utilization of black and white colobus monkeys (Colobus angolensis) in three forests of varying human disturbance in the West Usambara Mountains of the greater Eastern Arc range. Behavioral scans were conducted recording C. angolensis majority behavior and tree species. Troop size, DBH, tree height, and the height of C. angolensis from the canopy were also recorded. The mean DBH of trees was calculated for each forest and used to survey forest composition. C. angolensis were determined to utilize tree species based upon use or availability in each forest type, further indicating tree species of conservation priority.

**ABSTRACT 19**

**Mood Modulation by Music: Neural Arousal and Attention**

Madison Bunderson  
Department of Psychology  
Faculty Sponsor/Mentor: Dr. Brandy Tiernan
Previous literature suggests that mood modulates the neural response to emotional stimuli. In the proposed study we will induce mood states with music, then use an oddball paradigm in which participants will categorize images as positive, negative, or neutral while brain activity is recorded. Our research questions include: a) if music is salient enough to change and stabilize mood and b) whether mood influences attention and arousal for negative events. We expect that mood states will elicit differential neural activity for negative images when participants are asked to categorize emotionally salient images. More specifically, neural response to negative images will be greater than the response to positive or neutral images when a positive mood is induced, an indication of increased arousal and attention shifting. The understanding of music’s influence and of the neural mechanisms underlying emotion, mood, and affect is invaluable due to their roles in our everyday life and behavior.

**ABSTRACT 20**

**Don't Yak Back: Effects of Media Usage and Feminist Identity on Body Satisfaction in College Women**
Alli Smith, Nicole Noffsinger-Frazier  
Department of Psychology  
Faculty Sponsor/Mentor: Dr. Nicole Noffsinger-Frazier  

Downing & Roush’s (1985) model of feminist identity development has inconsistently been linked to body satisfaction. Moreover, Downing & Roush’s model has been questioned for its relevance to young women today. This study examined the associations between feminist identity development, feminist self-identification, body satisfaction, and media usage, including social media and streaming websites. Participants were 79 undergraduate women, who completed a survey measuring the preceding factors. Results supported Erchull and associate’s (2009) theory that synthesis may be a natural starting point for young women’s feminist identity today. Support for the relationship between feminist identity and body satisfaction was inconclusive. Yik Yak, an anonymous discussion app, was predictive of body dissatisfaction. Future research should consider a more relevant model of feminist identity for young women today, as well social media’s mediation of both feminist identity and body dissatisfaction.

**ABSTRACT 21**

**Why Don't You Just Text me? Investigations in the Effects of Technology on Face to Face and Interpersonal Communication**
August Kirchner, Alli Smith, Sherry Hamby  
Department of Psychology  
Faculty Sponsor/Mentor: Dr. Sherry Hamby  

Purpose: Technology greatly affects how we communicate on a face-to-face basis. Literature has shown that technology has a large impact on the way we communicate with others, but it has failed to show precisely how it affects our relationships. Method: 65 participants from rural Appalachia participated in focus groups on technology use and digital privacy. Results: We found that technology negatively impacts face-to-face communication, thus harming interpersonal relationships. Themes include overuse of texting, lack of personal contact outside of the virtual world, and unawareness of one’s surroundings. Conclusions: Unlike previous literature, this study shifts from a broader focus on communication to the impact of technology on our relationships. While technology is a great aid to society, it can also be detrimental to our relationships. Further research should seek to understand the societal and interpersonal implications of our changing methods of social interaction.

**ABSTRACT 22**

**X-ray Fluorescence Microspectra Analysis of Metal Bioaccumulation in Spotted Gar Otoliths**
Nicole Fischer  
Department of Biology  
Faculty Sponsor/Mentor: Dr. Brandon C. Moore
Metal contamination can pose long-lasting effects to the fitness of aquatic organisms. Top predatory fish are more prone to metal bioaccumulation than animals lower on the food web. Spotted gar (Lepisosteus oculatus) collected from Felsenthal Reservoir NWR in southern Arkansas displayed high concentrations of mercury (Hg) and selenium (Se) in muscle and liver (up to 70 ppm). Otolith (ossified structure of the inner ear) ring counting was used to age fish and provide a marker for metal exposure across the fish lifespan. We employed radioisotope X-ray fluorescence (XRF) to analyze the elemental spectra of otoliths and compare these microchemistry spectra to those measured in muscle and liver tissues of the respective fish. We present the correlations and discuss how otolith metal bioaccumulation may serve as a measure of life-long exposures.

**ABSTRACT 23**

**Hemal Spine Morphology in Gambusia Affinis Collected from a Municipal Sewage Treatment Plant Lagoon**  
Ashley Malpica, Reeda Shakir, Nicole Fisher  
Department of Biology  
Faculty Sponsor/Mentor: Dr. Brandon C. Moore

A municipal waste waters may contain hormonally active compounds that disrupt normal hormone signaling and morphological development. In male mosquitofish (Gambusia affinis), developmental exogenous hormone exposure may result in impaired formation of male-specific enlarged hemal spine skeletal morphology. Enlarged hemal spines serve as anchoring points for muscles that direct the elongated anal fin, gonopodium, during its use in copulatory sperm transfer. May 2015, we collected Gambusia affinis from Lake O’Donnell, Sewanee and from lagoons in the down-pipe sewage treatment plant. We assessed the male specific hemal spines morphological markers as a bioindicator of hormonally active compound exposure and compared fish morphologies from between these two sites. Here we present skeletal morphology comparisons of male Gambusia collected from the two water bodies and assess if sewage effluent from a university has the ability to influence the biological development of the fish.

**ABSTRACT 24**

**Gonopodium Morphology in Gambusia Affinis Collected from a Municipal Sewage Treatment Plant Lagoon**  
Reeda Shakir, Ashley Malpica  
Department of Biology  
Faculty Sponsor/Mentor: Dr. Brandon C. Moore

Male Gambusia possess a modified, elongated anal fin, a gonopodium, which facilitates sperm transfer to females resulting in internal fertilization. Developmental exposure to hormonally active environmental factors has the ability to inhibit gonopodium development resulting in decreased elongation. Elevated levels of hormonally active chemicals, such as pharmaceutical estrogens, may be found in wastewater treatment sewage plant waters. Here we study two populations of Gambusia: one from the local municipality drinking water source (Lake O’Donnell) and another from the associated municipal sewage treatment plant. We investigated if male fish from the polluted treatment lagoons displayed altered gonopodium morphology, as compared to those of reference lake fish. We discuss our results in relation to the elevated levels of municipal pollution down-pipe from a large university and it’s potential ability to de-masculinize wildlife.

**ABSTRACT 25**

**Synthesis and Characterization of a Gold-Containing Derivative of KP1019**  
Katharine Barwick, Renata Roberge  
Department of Chemistry  
Faculty Sponsor/Mentor: Dr. Robert Bachman
In recent studies, KP1019 has been found to be an effective therapeutic agent to treat cancer while avoiding the side effects of other common anti-cancer drugs, such as cisplatin. The effective mode of action of KP1019, which contains a Ru$^{3+}$ metal center coordinated by two indazole and four chloride ligands, remains unclear. As part of an ongoing effort to investigate the metal center’s role in the action of this drug, we targeted a derivative based on an Au$^{3+}$ center. Our development of an effective synthetic methodology as well as characterization of the resulting complex will be presented.

ABSTRACT 26

**Mood and Memory in College Students**
Cody Bartz
Department of Psychology
Faculty Sponsor/Mentor: Dr. Brandy Tiernan

Sad moods impact memory. For example, depressed individuals retrieve less information than healthy controls on episodic memory tasks. Unfortunately depression is common on college campuses, where adequate retrieval is essential for high performance and achievement. Research suggests increased cognitive load affects memory. Full time college students enrolled in extra activities may feel stressed, which, in turn, influences mood and suboptimal memory retrieval. In this experiment, we examine the relationship between mood, cognitive load, and memory retrieval. Participants will complete self-report measures of mood, memory, and current workload, followed with a computer-based task to test cognitive load and memory. We expect that higher scores on measures of depression and sad mood will perform poorly on these tasks. Moreover, we expect that increase cognitive load will impact mood. We will use the results to support students and find useful strategies to promote work-life balance.

ABSTRACT 27

**A High-Throughput Screen of the MLSMR Collection to Identify Substrates of P-Glycoprotein**
Sonia C. Francone, Joanna E. Poprawski, Kyle R. Brimacombe, Min Shen, Mathew M. Boxer, Anton Simeonov, Matthew D. Hall, Michael M. Gottesman
Center for Cancer Research, National Cancer Institute of the National Institutes of Health.
Faculty Sponsor/Mentor: Dr. Michael Gottesman

As cancer mortality increases, it is necessary to understand why certain treatments are effective whereas others fail. A great challenge in cancer treatment is the acquirement of multidrug resistance (MDR). Cells with MDR overexpress proteins of the ABC family of efflux transporters, particularly P-glycoprotein (P-gp). This efflux protein scans the membrane and cytosolic space for molecules that are chemically unrelated to the cell, such as anticancer drugs. The poly-specificity of P-gp allows it to recognize several potential toxins and expel them from the cell, rendering treatment with anticancer drugs ineffective. To identify P-gp substrates, high-throughput assays were conducted using parental, non-resistant cell lines and their corresponding MDR sublines. Compounds were obtained from the NCATS MLSMR collection and the results showed that P-gp has several potential substrates, which are currently under further examination to determine if common pharmacophores are present.

ABSTRACT 28

**Reaction of KP1019 with DNA Bases**
Mellie Lammon, Helena Brooks, Matson Conrad, Mikyas Duga
Department of Chemistry
Faculty Sponsor/Mentor: Dr. Robert Bachman

KP1019, a ruthenium-containing anion, is known to have cancer-fighting abilities. Despite already being in clinical trials, its precise mechanism of action is unknown. However, in analogy with other known metallodrugs, KP1019
is hypothesized to interact with DNA via coordination to one or more bases. In order to gain additional insight into this possibility, one of the chlorine atoms on the central rubidium metal was replaced with a model DNA base unit to provide structural information that could provide spectroscopic data to aid future in vivo studies of this drug candidate. This presentation will discuss both the synthetic methodology employed as well as the spectroscopic and physical characterization of the DNA base adducts of KP1019.

**ABSTRACT 29**

**Let's Get Trashed: Sustainable Waste Management at Sewanee**

Lauren Newman  
Department of Earth and Environmental Systems  
Faculty Sponsor/Mentor: Dr. Emily White

American consumer culture has created a never ending cycle of buy-use-toss. Sustainable waste management aims to end this cycle and protect the environment, natural resources, and future generations. Currently, Sewanee’s waste goes to the Marion Co. landfill and the bulk of recyclables go to Franklin Co. Given the growing cost of landfill use, Franklin Co. has plans to expand recycling efforts, targeting paper generated by local schools and businesses. If Sewanee is to be a leader in sustainability, waste reduction must be a top priority. Sewanee’s waste management practices were evaluated by identifying the key players in trash production, removal, and disposal. Several opportunities for improvement were identified, especially in student dorms and academic buildings. Specific actions proposed to “green” waste management at Sewanee include expansion of the composting program, more efficient implementation of the three Rs, and interactive educational initiatives targeting students.

**ABSTRACT 30**

**Grading Scheme Study**

Social Research Lab: Dr. Jordan D. Troisi (Sewanee), Julian Wright (Sewanee), Dr. Bethany Fleck (Metropolitan State University of Denver), Rachel McGill (Metropolitan State University of Denver), Garrett Heatherly (Sewanee), Anna Bradley (Sewanee), Meaghan Gray (Sewanee), Alex Evans (Sewanee).  
Department of Psychology  
Faculty Sponsor/Mentor: Dr. Jordan D. Troisi

Many college level classes are graded on point-based systems determined by the amount of points earned throughout the semester. Students’ perceptions of the amount of points in a course have not been empirically examined. Using an experimental paradigm with online surveys, students (n = 216) at two universities reported their perceptions of college course vignettes: one in which 100 points were available and one in which 1000 points were available. Participants then completed a series of surveys. Results showed that students prefer and would be more likely to sign up for a course with a 100-point based grade scheme. Results also revealed that those in the 1000-point based condition experience more negative mood at the prospect of having points deducted. These effects were enhanced among female participants. Additionally, statistically controlling for income and race did not alter the results. We recommend that college courses offer fewer total points.

**ABSTRACT 31**

**rnr3 Affects Plant Development and Small RNA Biogenesis in Zea mays**

Department of Biology  
Faculty Sponsor/Mentor: Jay B. Hollick (Ohio State University, Molecular Genetics Department), Brandon Moore

There are specific haplotypes in plants that can undergo epigenetic silencing that is heritable. In Zea mays, purple plant1, has an allele Pl1-Rhoades, that exits in a transcriptionally active state (Pl-Rh) characterized by purple plant color and a derived transcriptionally repressed state (Pl') that shows a lightly-colored phenotype. Factors that repress the Pl' state, encoded by required to maintain repression (rnr) loci, were identified in a genetic screen.
Here we show that rmr3 mutant phenotype includes decreased levels of 24nt sRNA and developmental defects similar to rmr6 mutants, which encodes major Polymerase IV components. In addition, ocl2, a putative gene whose dysregulation could lead to the developmental phenotypes seen in Pol IV mutants, does not show increased mRNA abundance in rmr3. Identification of the rmr3 encoded product could address whether it acts as an accessory to Pol IV regulation of 24nt sRNAs or in a different manner affecting 24nt sRNA levels.

ABSTRACT 32

Plating and Perception: Investigating the Role of Plating on the Perceived Enjoyment of Food
Kathryn Dickinson, Abby Cole, Claire Huskey, Charles Colhoun
Department of Psychology
Faculty Sponsor/Mentor: Dr. Jordan Troisi

There is significant research investigating the relationship between the way food is plated, and the subsequent enjoyment of the food. We decided to compare the perceived enjoyment of the food on two types of plates and utensils and two different descriptions (detailed and limited). We hypothesized that the exact same meal served on ceramic plates with a detailed description would be enjoyed more than the meal served on disposable plates with a limited description. We had a total of 63 participants from ages 18 to 22, all undergraduate students at the University of the South. Contrary to previous research, we did not find a significant difference between the enjoyment of the food based on the plating and the descriptions. Contingent results, possible reasons for deviating conclusions, and further research directions are discussed.

ABSTRACT 33

Parallel Code for Filter Algorithms
Paul Ricks
Department of Mathematics and Computer Science
Faculty Sponsor/Mentor: Dr. Stephen Carl

With the rise of multicore processors in computer systems, and physical limitations on maximum processor speed, the use of parallel programming to improve application performance is increasingly important. The difficulty is that parallel software can be difficult to write and does not always result in improvement due to the higher overhead of parallel code. One possibility may be to write lower level methods and functions (such as sort and math libraries) as parallel code, allowing programmers using those libraries to write code that runs, to some extent, in parallel. This study looks at how to program a filter operation so that it runs on multiple cores, in the context of finding all divisors of a number. Filter functions would, at first glance, lend themselves to parallelization because they are “lazy” by nature and lazy operations are especially well suited to parallel code, but the low cost of the individual operations filter uses raises problems.

ABSTRACT 34

Evaluating the Effectiveness of Sewanee’s Wastewater Treatment
Megan Hopson
Departments of Biology and Chemistry
Faculty Sponsor/Mentor: Dr. Emily White, Dr. Deborah McGrath

Water quality is one of the world’s most pressing issues and wastewater treatment is essential to maintain human and environmental health. The Sewanee Utility District uses a series of facultative lagoons and chlorine to treat wastewater. The effluent is then sprayed onto the forest. As permitted by Tennessee Department of Environment and Conservation, sprayed effluent must contain less than 45 mg/L biological oxygen demand and 941 colony forming units of E. coli per 100 mL. While discharge to the surface streams is not permitted, three drainage streams pass through the sprayfields. These streams and the final lagoon were sampled weekly during winter 2015 and spring
2016 and a variety of parameters (phosphorous, nitrogen, total suspended solids, turbidity, bacteria, conductivity, dissolved oxygen, pH, and temperature) were determined. Results indicate that while treatment meets the required criteria, there is some evidence that spray irrigation of effluent affects stream chemistry.

**ABSTRACT 35**

**Study of Library Use and Impact on Academic Success**
Loren Ketelsen, Heidi Syler  
Department of Psychology  
Faculty Sponsor/Mentor: Dr. Helen Bateman

Research has shown that people who study in the library have a higher GPA. In a study by Thomas & Wang (2014) it was found that students who used the library had a higher GPA by 0.34%. George & Foster (2013) examined how people function in different areas of a library and found that students perform better in quieter environments with no distractions. Students spending time in groups are more easily distracted as they want to be included in conversation and prefer not to be left out. Our hypothesis is that if a student has a high GPA they will have frequented a quiet space in the library and they will also know how to use the library’s resources. In this study 75 students will be given a survey that examines their library use and how it impacts academic success. We predict that the higher GPAs represented will have a high correlation with the amount of time that students spend in the library.

**ABSTRACT 36**

**Heat Shock Response in Lung Fibroblasts to Changes in Environmental Calcium**
Cid Oculam, Oksana Creech, Logan Brammer  
Department of Chemistry  
Faculty Sponsor/Mentor: Dr. Bethel Seballos

Pulmonary fibrosis is a terminal disease characterized by the progressive scarring of the lungs. Fibrosis results from aberrant migration and proliferation of fibroblasts. Under normal circumstances fibroblasts secrete collagen and are necessary for wound healing. Under pathologic conditions, they remain long after the healing process is complete and continue to secrete excess collagen which impedes the contractile properties of a healthy lung. In this study, fetal lung fibroblasts were grown in culture in order to investigate factors that influence their migration. Scratch assays were conducted to examine the response of these cells under various extracellular calcium concentrations in the presence or absence of insulin. Additionally, given the roles of heat shock proteins HSP47 and HSP70 in wound healing, the relative expression of these proteins under different conditions was observed via Western blotting.

**ABSTRACT 37**

**Gender Differences In E-Cigarette Use Among Adolescents**
Yubisan Ventura  
Department of Psychiatry, Yale University School of Medicine  
Faculty Sponsor/Mentor: Dr. Grace Kong and Dr. Suchitra Krishnan-Sarin

Studies have shown that there are gender differences in tobacco use (i.e. cigarette smoking, smokeless tobacco, cigars, pipe, etc). Adult and adolescent males smoke more cigarettes per day than adult & adolescent females. Significantly fewer females inhale, if they do, fewer inhale deeply with every puff as compared to males. Females take fewer puffs than males and men have a larger puffing volume and longer puff duration than females. E-cigarette use continue to grow among adolescents. However, research has not analyzed whether there are gender differences in e-cigarette use. I hypothesize that there is a gender difference in e-cigarette vaping behavior among adolescents. Adolescent females will take fewer puffs as compared to adolescent males. Adolescent males will take deeper and longer puffs as compared to adolescent females.
Not a Coincidence: Counting Gamma-Gamma Coincidences
Aidan Farr
Department of Physics and Astronomy
Faculty Sponsor/Mentor: Dr. Randolph Peterson

$^{22}$Na decays by positron emission. The positron will annihilate with an electron simultaneously emitting two 511 keV gammas. Per the dictums of conservation of momentum, these gamma rays should be emitted at 180° to one another. By using two NaI(Tl) detectors, a gated counting system was constructed to verify this property experimentally through coincidence counting. This counting system was used to study the gamma-decay of $^{60}$Co. Theoretical arguments suggest that successive decay of a $^{60}$Co nucleus should display anisotropic properties. These experiments can be done in the advanced physics laboratory, but the counting system used for this experiment is novel by using a narrow pulse width for the gate signal instead of the very expensive timing circuits typically used.

Synthesis of KP1019 derivatives: Development of structure-activity relationships for a potential anti-cancer drug
Katharine Barwick, Sean Halloron
Department of Chemistry
Faculty Sponsor/Mentor: Dr. Robert Bachman

The anti-cancer drug KP1019 undergoing clinical trials has shown the ability to reduce tumor cell size with minimal side effects compared to more commonly used anti-cancer therapeutic agents. Although there is knowledge that this therapeutic agent results in disease stabilization in patients, its mechanism is still unknown. As part of a larger effort to elucidate KP1019’s mechanism of action, we are currently preparing derivatives of this complex to develop structure-activity relationships. One target utilizes a substitution of the ruthenium(III) center of KP1019 with a Pt(IV) center, changing both the overall charge of the complex and its electrochemical behavior. The second approach seeks to substitute the indazole on the parent drug with a carboxylate substituted derivative capable of chelating the metal centers upon loss of the anionic chloride ligands. The development of both synthetic approaches and the characterization of products isolated to date will be presented.

Managing the Domain: Compartments 31 and 33
Ligon DeVogel, Duncan Connelly, Alex Butler, James Wildasin
Department of Earth and Environmental Systems
Faculty Sponsor/Mentor: Dr. Scott Torreano and Dr. Karen Kuers

Forests require managers. Compartment 31 and 33 were studied to determine the current condition and trajectory of the Domain’s mixed hardwood forests. Conditions in the woods were quantified and described through cruising tracts to high levels of confidence. A initial comprehensive report was drafted outlining the stands and described multiple management options. Both compartments were re-cruised in the spring semester and a more in-depth analysis of stand ecology, economics and social attitude was performed. This final report highlights all aspects pertinent to managing forests and the many options available to future stewards of Sewanee’s woods.

Pride and Prejudice: Consequences of Race and Exposure to the Confederate Flag
Anna Bradley, Dr. Jordan Troisi, Dr. Regan Gurung, Sara BaIt, Alex Evans, Meaghan Gray, Garrett Heatherly, Julian Wright
Department of Psychology
Faculty Sponsor/Mentor: Dr. Jordan Troisi
Past research suggests that exposure to the Confederate Flag affects judgments toward nonwhite individuals. Our study furthered this research by focusing on different racial groups’ reactions to the Confederate Flag. Participants were Sewanee students (n = 41), 35 of which were white, and 6 of which were nonwhite. Participants were randomly assigned to view one of two sets of news headlines with accompanying images: one with stories featuring the Confederate Flag, and one without the flag. Afterward participants completed a series of questionnaires. Our results indicate that exposure to the Confederate Flag did not influence whites towards whites intended attitudes when encountering racism and personal attitudes about the flag. However, exposure to the Confederate Flag did significantly influence the responses of nonwhite individuals. Overall, the results suggest that exposure to the Confederate Flag has a greater impact on nonwhite individuals than white individuals.

ABSTRACT 42

Distributions of Crevice-Dwelling Salamanders on the Southern Cumberland Plateau of Tennessee
Benjamin Sadler, Kristen Cecala
Department of Biology
Faculty Sponsor/Mentor: Dr. Kristen Cecala

Lungless salamanders in family Plethodontidae rely on cutaneous respiration that drives habitat selection. Refuge from warm, dry microclimates on the Cumberland Plateau may often be found in crevices within sandstone and limestone bluffs. The objective of our study was to describe patterns of crevice occupancy by Plethodontid salamanders on the Domain. We surveyed 6.5 km of bluff habitat and measured microclimate environmental factors at random locations and at salamander detection locations. We found seven species of Plethodontid salamanders using crevice habitats, but only three species were abundant enough for statistical analyses. Eurycea lucifuga occupancy was best predicted by geographical location. Aneides aeneus occupancy was negatively correlated with forest loss, and Plethodon glutinosus presence was associated with cooler temperatures and water presence. Salamanders on the Cumberland Plateau regularly use crevice habitat as one mechanism for avoiding unfavorable climates.

ABSTRACT 43

Edible & Medicinal Forest Plants Trail
Gabrielle Marion, Alec Hill, Becca Hannigan, Hannah Glaw, Kirsten Bagwell
Department of Earth and Environmental Systems
Faculty Sponsor/Mentor: Dr. Karen Kuers

This project involves cultivating native plants with edible and medicinal properties in a forested area along a 0.3 mile trail between Lake Cheston and Clara’s Point Rd. The trail was selected because it provides a range of site characteristics in close proximity to one another, including shaded uplands, wet edge, and an open field near the University Farm. One stop will include mushroom logs, a common specialty forest product. A pamphlet and map will be available at the start of the trail, providing information about the edible and medicinal properties of each species, and identifying signs will be placed along the way. Species already growing along the trail will also be identified and labelled with descriptions of their uses. A GIS map will be stored in the University’s database. A plan for future development and maintenance, created in conjunction with the University Farm and Office of Sustainability, will be available for use by faculty and students.

ABSTRACT 44

International Children’s Advisory Network: Quantitatively Measuring Efficacy
Hallie Crosby, Charlie Thompson M.D., Brian Harel Ph.D. J.D., Nick Frederico, Sharon Smith M.D.
Department of Psychology, Yale University School of Medicine
Faculty Sponsor/Mentor: Linda Mayes M.D., Charlie Thompson M.D., Brian Harel Ph.D. J.D., Nick Frederico

The International Children’s Advisory Network (iCAN) is a worldwide consortium of KIDS Teams, Young Person’s Advisory Groups, and similar organizations working together to provide a voice for children in pediatric medicine.
To quantitatively gauge how iCAN’s mission is perceived among healthcare researchers, a survey was administered to 187 Pediatric Academic Societies Meeting attendees. Areas identified by 18% or more of the attendees as the biggest trouble areas for researchers, patient recruitment/retention, obtaining informed consent, and public perception of research, is already being addressed. 85% reported input from patients and families could help address challenges, and 97% reported it was at least somewhat important for children to have a voice. Future focus areas include feedback on recruitment strategies, implementation, and measurement of improvements in patient recruitment, understanding of consent, and child focus of project after advising.

**ABSTRACT 45**

**An Investigation into the Addition of Carboxylic Acids onto the Structure of KP1019**

Tyler Sudderth, Caty Hueske  
Department of Chemistry  
Faculty Sponsor/Mentor: Dr. Robert Bachman

KP1019 is a ruthenium based compound commonly used to treat cancer. We investigated the potential of altering the structure of KP1019 by attaching a carboxylic acid to the double bonded carbon in the five membered ring. However, issues arose with the hydrogen on the carboxylic acid attaching reacting with the amine group on indazole. To resolve this, we performed a reflux reaction to protect the hydrogen with a methyl group, which successfully produced 1H-Indazole-3-carboxylic acid, methyl ester. We then attempted to attach 1 to ruthenium. Progress of the experiment will be further discussed.

**ABSTRACT 46**

**Synthesis of Iron(III) and Cobalt(III) Substituted Variants of KP1019 Anti-Cancer Drug**

Veronica Gordillo-Herrejon, Taylor Morris, Eli Lavender, Miranda Callahan  
Department of Chemistry  
Faculty Sponsor/Mentor: Dr. Robert Bachman

KP1019, a molecule with a central ruthenium atom surrounded by four chloride and two indazole ligands, is an experimental anti-cancer drug. While this drug has shown promise in clinical trials, its mechanism of action is not well understood. In hopes of gaining insight into the role of the metal centers, we have undertaken the synthesis of derivatives of KP1019 with based on iron and cobalt. Comparing the properties of these derivatives to each other and to the parent drug will help develop structure function relationships with regard to both the reduction-oxidation and substitution chemistry of these complexes. We will present our synthetic approach to ions of the general formula $[\text{M(indazole)}_2\text{Cl}_2]^{-}$ as well as the physical and chemical characterization of these complexes.

**ABSTRACT 47**

**Predicting Formula 1: Econometric Analysis of Formula 1 Race Results**

Reed Jackson  
Department of Economics  
Faculty Sponsor/Mentor: Professor Marc St. Pierre

The year 1950 saw the introduction of a new category of motorsport, Formula 1, in which open wheeled racing car drivers competed in Grand Prix across Europe and America. Today, Formula 1 is not only of international significance, visiting 21 countries in the 2016 season, but it is a 16-billion-dollar-a-year industry. Despite this economic significance, very little academic work has been done regarding the sport. Recent papers have addressed the issue of driver skill, and some others on the regional impact of hosting a Grand Prix, but there is no empirical research on individual race predictions. This paper applies econometric analysis to contemporary Formula 1 race results with the goal of objectively predicting the finishing position of any given driver in a Grand Prix. Does a crash in a previous race have a measurable impact on future performance? How does one driver compare to another in inclement weather conditions?
ABSTRACT 48

Picrosirus Red / Circularly Polarized Light Visualization of Collagen Fiber Bundle Architecture in the American Alligator Phallus
Maria Granello, David Spears
Department of Biology
Faculty Sponsor/Mentor: Dr. Brandon C. Moore

Collagen fibers are extracellular matrix proteins that convey biomechanical strength to tissues and can limit flexion or expansion. The alligator phallus is composed of sections with differing biomechanical properties. The rigid shaft facilitates intromission during copulation, while the distal glans expands with increased blood pressure into an elaborate structure. Here, we examine the collagen fiber architectures that underly these phallic structures and posit how extracellular matrix structural variability translates into differing biological functioning.

ABSTRACT 49

Reroute of the Perimeter Trail in the Split Creek Watershed
William Reames, Ben Colley, Henry Clark, Mary Claire Craig
Department of Earth and Environmental Systems
Faculty Sponsor/Mentor: Dr. Karen Kuers

The purpose of our project is to reroute a severely eroded section of the Perimeter Trail in Split Creek Watershed in Sewanee, TN. Rerouting the trail and installing water-bars on the eroded sections will help the watershed return to its natural state. The trail maintenance will also eliminate further collection of skewed data from the flume, and allow trail-goers to enjoy a less disturbed trail. The sediment load that has been washed onto the bridge will be removed, weighed, and analyzed of its composition. The new trail will be constructed using best management practices and the sections that do not need to be rerouted will need water bars at increments depending on slope and erosional severity. The expected result of the project will eliminate the issues from the eroded trail and decrease the need of future management.

ABSTRACT 50

Lithography of Plasmonic Nanostructures for Enhanced Raman Spectroscopy
Davis Easley, Xin Chen, Dr. Eugenii Donev
Department of Physics and Astronomy
Faculty Sponsor/Mentor: Dr. Eugenii Donev

When analyzing compounds via Raman spectroscopy, it is often beneficial to combine the sample with an array of gold or silver nanoparticles. These “plasmonic” particles can increase the ordinarily weak Raman signal due to the collective oscillations of their free electrons resonating strongly with both the incident and Raman-scattered light. This strong optical response leads to the highly sensitive technique of surface-enhanced Raman spectroscopy. In this work we endeavor to produce periodic arrays of signal-enhancing silver nanostructures (particles and holes) using a cost-effective interference lithography system. By using constructive interference from blue laser light in a Lloyd’s mirror interferometer, followed by electron-beam vacuum deposition, we can pattern large-area samples with these plasmonic nanostructures. I will be presenting on our progress toward this goal and its potential to enhance the Raman spectroscopy capability at Sewanee.

ABSTRACT 51

Doppler Shift Measurements of Hydrogen Clouds in our Galaxy
Carlyn Augustine
Department of Physics and Astronomy
Faculty Sponsor/Mentor: Dr. Randolph Peterson
Smiley is a 4.6 meter (15 feet) radio telescope operated as a user facility by the Pisgah Astronomical Research Institute that is designed to detect 21 cm radio waves emitted by hydrogen gas clouds. By measuring the shifts in frequency due to the Doppler effect, the longitudinal velocity of each hydrogen cloud can be measured as a function of the viewing angle from the center of our galaxy, the Milky Way. This data is used to determine the Milky Way’s structure and rotation.

**ABSTRACT 52**

**Comparison of Water Quality of Streams Above and Below the Sewanee Utility District**

Nate Greene, Jared Zissu, John Bell  
Department of Earth and Environmental Systems  
Faculty Sponsor/Mentor: Dr. Scott Torreano

The Sewanee Utility District (SUD) treats wastewater for the town of Sewanee, TN. Primary treated wastewater is pumped to and further treated in three facultative lagoons. This naturally treated water is then lightly chlorinated and pumped to spray fields located throughout the property. Sprinklers distribute the water in vegetated areas to undergo further bio-remediation. In accordance with state permits issued to the SUD, it is essential that the water infiltrate into the soil, rather than entering waterways. The goal of our project is to determine if and how well the SUD is following its state mandated permit. In order to supplement data from 2015, we analyzed three primary streams running through the SUD property. Additionally, water from control streams, storm flow samplers, as well as one lagoon will be analyzed. Samples are compared and contrasted with regards to nutrient, bacterial, and physical characteristics.

**ABSTRACT 53**

**Chandra Shock-Heating Analysis of AGN systems**

Taylor Morris  
Department of Physics and Astronomy  
Faculty Sponsor/Mentor: Dr. Randolph Peterson and Dr. Douglas Durig

Active Galactic Nuclei (AGN) play an important role in galaxy evolution, and dynamical studies of the high energy jets on single galaxy scales is a relatively unexplored area of research. Using archival data from the Chandra X-ray observatory, we present brightness and spectral energy results for X-ray jet and radio lobe systems, such as the galaxy NGC1052, and use these measurements to determine various galactic outburst parameters.

**ABSTRACT 54**

**Deposition and Plasmon Resonance of Thin Films**

Griffin Beriont  
Department of Physics and Astronomy  
Faculty Sponsor/Mentor: Dr. Randolph Peterson and Dr. Eugenii U Donev

A particle beam accelerator deposition machine was used to create nanometer thin films and silver and gold. Using an optical setup utilizing a laser, surface plasmon resonance of these films can occur. Measuring how the voltage input and output changes with a function of angle of interaction shows that a resonance occurred. This data shows what that angle would be for each of the two metals.
ESR and NMR
Will Jenkins
Department of Physics and Astronomy
Faculty Sponsor/Mentor: Dr. Randolph Peterson and Dr. Eugenii U Donev

Earth’s always present magnetic field allows us to observe Larmor precession of protons in water using NMR (nuclear magnetic resonance), a device very similar to the more commonly known MRI (magnetic resonance imaging), to create a polarizing field. I will discuss the theory behind Larmor precession mainly consisting of relationships between the magnetic moments of the protons, frequency of their precession, and the external magnetic field. In addition I will also discuss the phenomena known as electron spin resonance or ESR using a newly developed laser optical setup to allow observation of this. This involves excitation of an electron pair using a microwave resonance frequency to change spin quantum numbers, and then witnessing the difference in fluorescence intensity as magnetic fields are altered. Electron spin resonance is different in many ways from NMR with some important similarities, which I will discuss.

Development of an X-ray Fluorescence Method for the Detection of Mercury Vapor
Anna Williams
Department of Chemistry
Faculty Sponsor/Mentor: Dr. Robert Bachman

The release of mercury vapor come from diverse sources in museum/archival contexts including mercury-containing mineralogy specimens (cinnabar), lacquer ware, paintings (vermillion), and herbarium specimens (mercuric chloride). Most tests for this vapor either rely on dedicated and costly analyzers or semi-quantitative colorimetric indicators. Access to instrumentation such as a portable X-ray fluorescence spectrometer, which should be able to detect and quantify mercury vapor collected on a suitable sorbent, is increasingly common in a museum/archival context. Consequently, we are currently attempting to develop a simple and reliable method based on X-ray fluorescence that will provide quantitative, rapid, and cost-effective detection of mercury vapor associated with cultural artifacts that utilize mercury-containing pigments or preservative materials.

Effects of Medical Advancement on Mortality within the Sewanee Community and Surrounding Areas
Anna Williams, Rachel Hudson
Department of Biology
Faculty Sponsor/Mentor: Dr. Alyssa Summers

This project examines how medical advancements shaped the history of the local community. We gathered data from five cemeteries in the Sewanee area: Gipson, Garner, Cherry, Winchester, and the Sewanee University Cemetery. Data from gravestones was analyzed for trends in mortality rates. Our results demonstrate that local mortality trends reflect larger events in medical history- for instance, infant mortality rates skyrocketed in the 1880s due to influenza and in 1918, a deadly Spanish flu epidemic swept through Winchester. By the 1940s, vaccine development greatly reduced these numbers. During the decades after the university’s refounding, Sewanee was considered to be a “spring of health”, since its altitude lowered the number of malaria cases. In contrast, malaria remained a prominent killer in the four cemeteries located outside of Sewanee. In conclusion, local mortality rate data can show us a timeline of medical history, as well as the impact of disease and development.
ABSTRACT 58

Daniel Rosales Giron
Department of Physics and Astronomy
Faculty Sponsor/Mentor: Dr. Randolph Peterson

Plasma, the fourth state of matter, is the basis for a wide variety of phenomena that are currently the focus of study for research groups around the globe and present a wealth of applications from all areas, such as energy production, astrophysical studies, medical appliances, etc. The building of an affordable yet effective setup capable of producing plasma and giving the tools to study it’s characteristics is given, as well as a variety of experiments to determine essential parameters of the plasma. The requirements for the creation of plasma are explored developing an understanding of how pressure and distance affect the voltage required to ignite plasma. This is followed by a discussion of spectroscopy and how we can use this noninvasive method for identification of the gas within the setup and the measurement of the electron temperature. This is then contrasted with the informative, yet invasive, method of using Langmuir probe characteristics to find the plasma properties.

ABSTRACT 59

**Overcoming Acquired Resistance to Targeted Therapies in Lung Cancer**
Hayden Byrd
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Despite efforts, lung cancer remains the most common cause of cancer-related death in the world. New strategies for treatment focus on targeted therapy at the cellular level. Irregularly expressed tyrosine kinases are of particular interest for their role in cancer cell proliferation. Genomic alterations in the tyrosine kinases, Anaplastic Lymphoma Kinase and Epidermal Growth Factor Receptor, are found in distinct cohorts of patients with lung cancer. These mutated kinases are therapeutically targetable with orally administered tyrosine kinase inhibitors (TKIs), several of which have already gained approval from the FDA given their dramatic response rates and significantly improved clinical outcomes in lung cancer patients. Unfortunately, acquired resistance to TKI therapy has become another obstacle to overcome. This study investigates the effectiveness of novel targeted therapies as well as rational combination therapies in ALK-mutated and EGFR-mutated lung cancer cell lines.

ABSTRACT 60

**Scalar Effects of Land Use on Microclimate and Plethodontid Salamander Populations**
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The past several decades have seen dramatic expansion of human land use in the southern Appalachian region. These changes in land use may bring with them changes in habitat structure and even microclimatic regimes. The highly adapted plethodontid salamanders of the Appalachian mountains are especially at risk from shifting climatic and microclimatic regimes, and have already seen significant declines in populations in the past several decades. This study examines the links between human land use and microclimatic and habitat variables, as well as the influence that these factors may have on plethodontid salamander occupancy. Microclimate, habitat, and salamander occupancy data were collected at 12 sites in Sewanee, TN, representing 4 different management regimes. The results of this study indicate that plethodontid salamander occupancy may not be greatly affected by management regime alone, but instead by a number of different factors which may or may not be associated with land use.
Raman Spectroscopy at Sewanee
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Raman spectroscopy is a powerful technique used to identify and quantify molecules or atoms present in liquid, powder and solid samples. By analyzing the scattered light from a material over a range of frequencies one can determine its composition. Photons coming from a monochromatic light source scatters inelastically at the analyte surface, resulting in the wavelength to be slightly longer than the incident wavelength. This shift depends sensitively on the specific vibrational and rotational modes of the molecule, giving every compound a unique spectral ‘fingerprint’. At Sewanee, we have built a versatile, user-friendly, and cost effective Raman setup capable of handling a wide variety of samples such as thin films, powders, liquids, pills, etc. without loss in resolution or imaging power. Future work includes the production of nanoparticles engineered to enhance the Raman signal received from our setup, and using this for imaging highly diluted substances and trace amounts.

Assessment of Interference caused by Infrared Luminescent Pigments in infrared Reflectance Imaging
Rebecca Lobach
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Infrared reflectance imaging is a powerful technique for the study of paintings as the greater penetration of infrared radiation can frequently reveal subsurface details such as underdrawings or compositional changes. These details can in turn provide insight into the artist’s process or historical details of the object (e.g. canvas recycling). The complications caused by infrared absorbing pigments are relatively well understood. However, much less is known about how the presence of visibly-induced infrared pigments, or the interaction of these pigments with various binding media, impact this imaging technique. In order to answer this question, we have undertaken a systematic study to image carefully prepared test panels of known pigments using differing thicknesses of paints made with three binding media-acrylic, gum Arabic, and linseed oil.

Investigating the Mutant p53-Adapted State in Triple-Negative Breast Cancer
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Faculty Sponsor/Mentor: Dr. Jennifer Pietenpol and Dr. Jim Patton

There is a need for effective therapeutic targets in triple-negative breast cancer (TNBC) due to its aggressive nature. Our laboratory is exploring the biochemical state associated with mutant p53, a protein mutated in 60% of TNBC cases, using gene editing techniques. Our preliminary data demonstrates CAL51, a TNBC cell-line expressing wild-type p53, undergoes transient p53 accumulation and target gene activation in response to DNA damage. Based on previous reports, we hypothesized that an isogenic, homozygous R248W mutant clone of CAL51 would lack the ability to transactivate MDM2, thereby display increased baseline levels and a lack of accumulation of p53. However, we observed that while the mutant cells indeed harbor higher baseline and lack expression of target genes, they transiently accumulate p53, implying the retention of some regulatory capacity. Based on these findings, we are exploring alternate mechanisms of p53 regulation.
HDAC-Mediated Transcriptional Control of GIMAP7
Jacob Zalewski
Department of Biology
Faculty Sponsor/Mentor: Dr. Alyssa Summers

HDACs are key regulators of cell proliferation, cell-cycle progression, and apoptosis. Expression of HDACs is increased in cancer, and the use of HDAC inhibitors (HDIs) in the treatment of cancers is becoming increasingly common. GIMAPs are required for the development of T-cells in the thymus, and have altered function/expression in T-cell lymphomas. Developing a clearer understanding of the effects of HDAC activity on GIMAP expression is important for improving current treatments. Here, we investigated the relationship between HDAC3 and GIMAP7 expression/promoter activity in murine fibroblasts and T-cell lymphoma cells treated with HDI. Luciferase Assays, qRT-PCR, and RNA-sequencing showed significant effects of HDAC3 inhibition and up-regulation on GIMAP7 expression/promoter activity. Our findings suggest HDAC3 transcriptional control of GIMAP7 and identify a possible target for therapeutic HDI treatment.

Ant Diversity in Newly Established Coffee-Based Agroecosystems in Bois Jolie, Haiti
Scott Summers, Geanina Fripp
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Faculty Sponsor/Mentor: Dr. Deborah McGrath

The Sewanee Haiti institute and Zanmi Kafe have been collaborating in an effort to promote sustainable agroecosystems in Haiti through coffee production. Many insect species, particularly ants, can affect the health of coffee. Baseline ant diversity data was collected to quantify ant richness. A total of 21 species across 17 genera were found. Some species can be used in integrated biocontrol to control other pest insects, such as green scale, as well as disease, such as coffee rust.

Long-term Management Plan Proposal for the Emerald Ash Borer on Sewanee’s Domain
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Department of Earth and Environmental Systems
Faculty Sponsor/Mentor: Dr. Karen Kuers

The overall goal of this project is to develop a long-term management plan to reduce the impacts of the emerald ash borer (Agrilus planipennis) on Sewanee’s 13,000 acre Domain, as well as determine the current status of emerald ash borer on the domain. The emerald ash borer is an invasive insect species that arrived to the United States Great Lakes region and is traveling south towards Tennessee. This insect currently has the potential of attacking and killing all North American ash (Fraxinus spp.) species. This study involved a reinventory of 89 ash stems in central campus and the establishment of 6 20 x 20 meter permanent forest plots that are on the domain to monitor ecological succession, and follow the consequences of the emerald ash borer infestation. Three plots have no ash species present along with 3 plots where ash is present. All vegetation ≥ 2.5 cm at DBH were plotted and identified. Small stem inventory ≥ 1.37 m but ≤ 2.5 cm DHB were measured.