

CELEBRATION

A COLLOQUIUM ON UNDERGRADUATE RESEARCH, CREATIVE ACTIVITY, AND COMMUNITY ENGAGEMENT

Do great work

Celebration

Celebration 2015

May 1st, 9:00 AM - 5:00 PM

Celebration Schedule 2015 (Friday)

Provost's Office
Gettysburg College

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Description

Full presentation schedule for Celebration, Friday, May 1, 2015

Location

Gettysburg College

Disciplines

Higher Education

Celebration '15: A Welcome from the Provost

I want to welcome you to Gettysburg College's Seventh Annual Colloquium on Undergraduate Research, Creative Activity, and Community Engagement.

Today is truly a cause for celebration as our students present the results of the great work they've been engaged in during the past year. Students from across the disciplines are demonstrating over the next two days what's best about the Gettysburg College experience— intentional collaborations between students and their mentors such that students acquire both knowledge and skills that can be applied to many facets of their future personal and professional lives.

The benefits for those who mentor these young adults may, at first, be more difficult to discern. Most of those who engage in mentoring do it because they enjoy being around students who are eager to learn what they have to teach them. They enjoy the one to one relationship that can be achieved mentoring a student through a research or creative project that they don't always have the opportunity to achieve when teaching in the classroom. Some faculty mentors do get assistance in their own research from their students and sometimes students come up with a novel way of thinking about a process or approaching a problem that also clarifies the faculty member's thinking. For the most part, however, those who serve as mentors derive satisfaction from passing on their intellectual legacy to the younger generation.

Thus, *Celebration* provides an excellent opportunity for the entire Gettysburg College community to reflect upon and share all that we have learned from one another over the past academic year.

I hope you enjoy these two days as you choose among the many posters, research papers, plays, films, and musical performances presented by our students. The excitement and energy generated by this event is made possible in no small measure because of those of you who will be attending the sessions.

We are grateful for your support.

Sincerely,

Christopher J. Zappe, Ph.D.

Provost

ACKNOWLEDGEMENTS

Celebration '15 would not have been possible if it weren't for the efforts of a good many people on campus. For this reason, we wish to thank the following individuals:

Bharath Srinivasan, John Whitehouse, and Gavin Foster, Instructional Technology, for facilitating the online registration and scheduling processes. We also wish to thank their wonderful and indispensable interns, Rachel Fry '15 and Jackson Davis '16;

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Cathy Zarrella, College Scheduling Coordinator *extraordinaire*;

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Kim Breighner, Poster Queen, and Digital Center Coordinator (we'll miss ya, Kim!);

Staff and Student volunteers;

Members of the *Celebration '15* Planning committee: Kathy Berenson, Josef Brandauer, Shannon Egan, Eleanor Hogan, McKinley Melton, Thomas Jurney, Carla Pavlick, and Carolyn Tuckey, for their continued support throughout the process. A special thanks to Eleanor Hogan and Josef Brandauer for taking on the huge task of organizing the poster session!

And, most of all...

All the student presenters and their faculty mentors`

Thanks to everyone for your efforts!

Maureen & Paula



Friday
May 1, 2015

Poster Session

College Union Building

Ballroom

4:00 p.m.—5:30 p.m.



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Africana Studies

The Haitian Struggle for Human Rights in the Dominican Republic

<u>Student(s):</u>	<u>Mentor(s):</u>	<u>Time/Location:</u>
Annette Aguilera-Gonzalez, Cassandra Wells, Cheery Huang, Megan Zagorski, Meredith McGann, Naima Scott, Ophelia Afflick, Sydney Braat	Paul Austerlitz	4:00pm - 5:30pm College Union Ballroom

A week-long immersion trip in the Dominican Republic based on the issues surrounding Haitians living in the DR. Haitian immigrants and Dominicans with Haitian descent who have been living in poor working and living conditions in the bateyes (sugar cane villages) which are systematically enforced because of “ antihaitianismo, ” a culturally accepted discrimination against Haitians. The purpose of this presentation is to illustrate our growth and learning experiences outside of the classroom to the campus. The intensive five-day trip included visits to social justice organizations such as MUDHA, visits to local schools and visits to bateyes. Immersion trips are an important outlet for students to reflect and evaluate other aspects of their lives such as social justice, a growth in ethnic consciousness and one ’ s understanding of poverty and discrimination in the world. Though this trip did not only focus on the discrimination that these people face, it also considers the cultural traditions that help sustain the Afro-Dominican fight for social justice through music and rituals.

Biology

Analysis of Dip-B mRNA isoforms in *Drosophila melanogaster*

<u>Student(s):</u>	<u>Mentor(s):</u>	<u>Time/Location:</u>
Chelsea Loughner	Kazuo Hiraizumi	4:00pm - 5:30pm College Union Ballroom

Peptidases are hydrolytic enzymes that serve as a good model system to study genetic effects on gene expression because of their ubiquity and presence of multiple forms among virtually all organisms. In *Drosophila melanogaster*, at least two groups of peptidases exist: leucine aminopeptidases (LAP) and dipeptidases (DIP). Dip-B, the gene that encodes the dipeptidase B (DIP-B) enzyme, is of particular interest because four mRNA isoforms have been reported (isoform A, isoform B, isoform C, and isoform D). These Dip-B mRNA isoforms differ in base sequence and length, which could potentially contribute to quantitative differences in the number of enzyme molecules that are translated, thus in enzyme activity levels. The possibility of differential splicing within the 5' UTR (untranslated region) of the Dip-B initial transcript was investigated, *in silico*. Using consensus splice junction sequences as criteria, a Python program was created that generates a list of possible Dip-B mRNA isoforms. The applicability of differential splicing was evaluated by comparing the 575 predicted isoform sequences from the program to the four reported isoforms. The sequences of the predicted mRNA molecules can serve as the basis for the construction of PCR primers to amplify mRNA isoforms *in vivo*. Sizes of the predicted isoforms can be used to detect and identify potential Dip-B mRNA isoforms that might not have yet been reported by RT-PCR and Northern analysis. These studies could suggest the role of qualitative and quantitative variation in mRNA isoforms in the regulation of enzyme activity levels.

Analysis of HIV-1 Replication: RRE Structure and Function

Student(s):

Laura Brumbaugh, Taylor Randell

Mentor(s):

Ina O'Carroll

Time/Location:

4:00pm - 5:30pm

College Union Ballroom

The Human Immunodeficiency Virus Type 1 (HIV-1) is a potentially deadly virus belonging to the retrovirus family, which attacks the immune system of its hosts. The virus makes use of the host's cellular machinery in order to successfully replicate its genome and ensure survival. In order to do this, the virus must be able to export its mRNA in three forms; fully spliced, partially spliced, and unspliced. Because eukaryotes exhibit a nuclear retention mechanism that prevents unspliced and partially spliced mRNAs from exiting the nucleus, HIV-1 requires the Rev Response Element (RRE). The Rev protein dimer is produced via the exported fully spliced mRNA and re-enters the nucleus in order to bind to the RRE, allowing for the export of the partially spliced and unspliced mRNA. The RRE is composed of five stem domains, creating an "A" type structure. It has been previously shown that stem loops I and IIB are directly involved in the binding of the Rev dimer, however the precise functions of the other stem domains are not well defined. This set of analyses evaluated the relative importance of each of the stem domains by assessing RRE function with the elimination of various stem groups. The study deduced the components necessary for sufficient RRE function in an attempt to better understand the replicative mechanism of HIV-1, paving the way for novel treatment options focused on mRNA as opposed to the tradition focus on proteins.

Antidepressants venlafaxine and fluoxetine produce different effects on locomotion in two species of marine snail, the oyster drill (*Urosalpinx cinerea*) and the starsnail (*Lithopoma americanum*)

Student(s):

Abigail Dworkin-Brodsky, Taylor Bury

Mentor(s):

Peter Fong

Time/Location:

4:00pm - 5:30pm

College Union Ballroom

Human antidepressants have been previously shown to induce foot detachment from the substrate in aquatic snails. Prior to foot detachment, antidepressants also affect snail crawling speed. We tested two commonly prescribed antidepressants, venlafaxine (" Effexor ") and fluoxetine (" Prozac ") on crawling speed and time to reach the air water interface in two species of marine snail, the oyster drill *Urosalpinx cinerea* and the American starsnail *Lithopoma americanum*. Exposure to venlafaxine increased crawling speed in both species, while fluoxetine slowed them down. Our lowest LOEC (lowest observed effect concentration) was 31.3 µg/L venlafaxine in *Urosalpinx*. Similarly, snails (*L. americanum*) exposed to venlafaxine tended to move faster and more often to the air water interface, but exposure to fluoxetine slowed them down. Our lowest LOEC was 345 µg/L fluoxetine in *Lithopoma*. These results indicate that venlafaxine boosts locomotion, while fluoxetine reduces it, and both behaviors are preludes to foot detachment. The different effects of these two antidepressants on snail locomotion suggest differing physiological mechanisms of action in marine snails as well as possible ecological consequences.

Characterization of a skin microbe from the inner elbow using a suite of methods

Student(s):

Jasper Leavitt

Mentor(s):

Jennifer Powell

Time/Location:

4:00pm - 5:30pm
College Union Ballroom

The human skin microbiome is made up of an extremely diverse collection of bacteria, fungi, and viruses. Different people and different parts of an individual 's body can have drastically different ecosystems. The study of the human microbiome is an emerging field for modern health and medicine, testing this diversity against diseases to find any relationships between the two. This study served to test a single isolate from the skin microbiome of a healthy individual. The isolate was taken from the inner elbow due to its lack of contact with potential transient contamination. Using a series of tests, I will characterize the isolate 's metabolic lifestyle, antibiotic sensitivity, and eventually the bacteria 's genome to determine what exactly is living in this area of the skin.

Characterization of various human microflora and identification of a single strain

Student(s):

Eun Chon

Mentor(s):

Jennifer Powell

Time/Location:

4:00pm - 5:30pm
College Union Ballroom

Having been around for billions of years, bacteria have had the time to undergo mutations and diversify in ways that have led to the variety of species that exist today. Even within just the scope of the human body, there are thousands of different kinds of bacteria that are found in the intestines, mouth, and on the skin. The skin in particular harbors bacteria that are localized to niches based on the environment that a specific area of the skin provides. In order to explore the diversity of microflora of the human skin, strains of bacteria were isolated from the ankle, under the fingernail, and behind the ear. These strains were called EC-A, EC-F, and EC-E; respectively. It was found that the three isolated strains were all different species with varying in morphology, metabolic profile, and resistance to five different antibiotics. While all three strains were characterized, only EC-E DNA that codes for the 16s rRNA was PCR amplified, run on a gel, and genetically identified as a specific species. The growth rate of EC-E was observed in addition to all the other tests. These results not only added to the understanding of human microflora diversity, but tests such as antibiotic resistance could have significance in understanding human health and disease.

Examining the initiation of algal cell entry into an embryonic salamander host

<u>Student(s):</u>	<u>Mentor(s):</u>	<u>Time/Location:</u>
Jasper Leavitt	Ryan Kerney	4:00pm - 5:30pm College Union Ballroom

Mutualistic endosymbioses are relationships between organisms in which one symbiont enters the cells of a host, and both organisms benefit from the relationship. While there are many examples of this in invertebrates, the only known example of a mutualist entering the cells of a vertebrate is in *Ambystoma maculatum*, commonly known as the spotted salamander. This Pennsylvania-native species almost always has an algae inside of its egg capsules, and this algae enters cells during development. The mechanism of cellular entry is currently unknown. Two likely candidates are: a.) an invasion by the algae, similar to what is utilized by vertebrate pathogens, or b.) a recruitment by the host, which is found in many invertebrate endosymbioses. To study this, I set up co-cultures of *A. maculatum* and a sister species that does not have cellular entry (*Ambystoma gracile*, the Northwestern salamander). Another unknown aspect of this relationship is where the algae originate from. They could come from algae still existing in the parent 's reproductive tract, known as vertical transmission, or they could enter the eggs from the environment, a phenomenon called horizontal transmission. To examine this, I will collect adult *A. maculatum* and induce laying in a sterile environment.

Global Amphibian Declines Independent Projects

<u>Student(s):</u>	<u>Mentor(s):</u>	<u>Time/Location:</u>
Alexander Gold, Amanda Finck, Emily Garrigan, John Gentes, Matthew Sult, Nathan Arndt, Nolan Skirtich, Richard Gawel, Yiran Mao	Ryan Kerney	4:00pm - 5:30pm College Union Ballroom

A recent assessment of the conservation status of the world 's amphibians revealed nearly one third as being threatened (32%; IUCN Redlist). This includes 1,856 species with a broader 2,469 species (43%) shown to be in decline and 168 that went extinct over the last two decades. There are multiple causes of these declines including habitat loss, chemical contaminants of the environment, climate change, and emerging infectious diseases. Determining the impacts and synergisms of these combined causes calls for multiple research approaches. This poster presents four independent student projects on the following causes of global amphibian declines: *Batrachochytrium dendrobatidis* (BD) zoospore detection on spring-breeding amphibians, BD environmental DNA detection, limb loss in tadpoles, and pesticide effects on an algal symbiont. These projects were done in the HHMI-funded introductory research course, Biology115 " Global Amphibian Declines. "

Hidden Microbe: Identification of Unknown Microbe from the Non-dominant Palm

<u>Student(s):</u>	<u>Mentor(s):</u>	<u>Time/Location:</u>
Margaret Johnson	Zakiya Whatley	4:00pm - 5:30pm College Union Ballroom

The human microbiome is an aggregate of microorganisms that reside on the surface and within deep layers of the skin. The average adult possesses 10 times more microbial cells than human cells. The microbiome has been implicated in the development of certain antibiotic. This work details the isolation, characterization, and identification of an unknown microbe collected from the non-dominant palm of a Gettysburg College student donor. Following isolation, the unknown bacterium was maintained as a laboratory stock. Characterization of this strain included cellular and colony morphology, Gram status, metabolic activity, growth rate and antibiotic sensitivity. Additionally, this strain was further characterized by molecular identification using 16S rDNA and phenotypic testing via the GenIII MicroLog assay. Identification of this strain gives further insight into the microbiological composition of the student donor as well as the Gettysburg College community.

Identifying bacterial species from various body locations via isolation and classification

<u>Student(s):</u>	<u>Mentor(s):</u>	<u>Time/Location:</u>
Mary Kamovitch	Zakiya Whatley	4:00pm - 5:30pm College Union Ballroom

The skin is not as welcoming for microflora as the GI tract was described. The skin has many protective layers, such as the epidermis, that resist penetration of bacteria, thus maintaining the moisture and nutrients to the inside of the body. Although the skin regenerates itself and is in a constant state of shedding dead skin cells, the skin is estimated to have about one billion bacteria per square centimeter. Hairy, moist areas with cutaneous invaginations including sweat glands and hair follicles prove to be bodily locations where microflora flourish. Microflora on our skin is an important part of our life. Microflora formation begins during the birthing process and initiates our immune system, which is a vital part of our body's system on fighting foreign agents. This project was to identify personal microflora through isolating and characterizing bacteria from specific yet different locations on the body and to compare and contrast how the microflora was similar or different. This allowed research to be done expressing how human microflora growth in specific locations can either thrive or lack ability to grow. Through swabbing techniques, microflora was obtained and plated for isolation and characterization. The scalp location deemed itself to be the most prosperous environment for microflora growth due to the hair and glands that help trap and nourish the microflora. Various tests such as phenotypic characterization, metabolic characterization, antibiotic sensitivity, growth curve and generation time, and species identification tests were all conducted to confirm the species.

Identifying downstream targets of FSHR-1 in the *Caenorhabditis elegans* innate immune response

Student(s):

James Nguyen

Mentor(s):

Jennifer Powell

Time/Location:

4:00pm - 5:30pm

College Union Ballroom

The innate immune system is an evolutionarily ancient defense mechanism that represents the first line of defense in fighting off infection in invertebrates and vertebrates, as well as plants.

Caenorhabditis elegans is an excellent model organism for studying innate immunity because it possesses a simple immune system with many similar components to those of the mammalian innate immune system. Furthermore, they are easily infected in the intestine by replacing their normally ingested bacteria with pathogenic bacteria. In response to recognizing pathogenic infection, *C. elegans* activates several signal transduction pathways that result in the expression of antimicrobial compounds. FSHR-1 is an intestinal G protein-coupled receptor (GPCR) that plays a central role in the *C. elegans* innate immune response. While the downstream transcriptional targets of FSHR-1 are known, the specific components of the signaling cascade are yet to be determined. Based on the identity of FSHR-1 as an LGR class GPCR, we propose that the detection of pathogenic infection results in the activation of a heterotrimeric G-protein and subsequent activation of an adenylyl cyclase. We performed an epistasis experiment in which intestine-specific RNA interference was used to knockdown the functions of *gsa-1*, which has been previously shown to act in innate immunity, and the four known adenylyl cyclases in *C. elegans*: *acy-1*, *acy-2*, *acy-3*, *acy-4* in an *fshr-1(ok778)* mutant background. Our results suggest that *acy-1* may play a role in innate immunity and act downstream of *fshr-1*.

Investigating epigenetic mechanisms of transcriptional repression in *Aspergillus nidulans* *snxAHrb1* mutants by removal of histone deacetylases

Student(s):

Dina Mohamed-Aly

Mentor(s):

Steven James

Time/Location:

4:00pm - 5:30pm

College Union Ballroom

The acetylation of histone proteins associated with chromosomal DNA is a posttranslational modification that is carried out by acetyltransferases (HATs) and reversed by histone deacetylases (HDACs). These epigenetic modifications reversibly activate and repress gene expression, respectively, by either loosening the association of histones with DNA (HATs) making DNA accessible to transcriptional machinery; or by compacting chromatin and to prevent transcription (HDACs). HATs loosen chromatin by acetylating and neutralizing the positive charge on lysine residues on N-terminal histone " tails " that extend from the core octamer of histone proteins (two molecules each of histones H2A, H2B, H3, and H4). We are using the model filamentous fungus, *Aspergillus nidulans*, to study histone modifications such as methylation and acetylation. In this study, we examined the roles of three histone deacetylases in growth, asexual sporulation and sexual development. In particular, we were interested in determining if loss of these HDACs could rescue transcriptionally repressed alleles of the *snxAHrb1* gene. Alleles of *snxAHrb1* generated by chemical mutagenesis are cold sensitive, with transcriptional efficiency reduced by 90-95%, yet they contain no DNA mutations in their coding and regulatory regions. These observations suggest an epigenetic basis for transcriptional down-regulation in *snxA* mutants. We deleted three HDAC genes, *sirA*, *hstA*, and *hosB*, and then combined them, singly and in combination, with *snxA* mutants. Deletion of *sirA* and *hosB* did not alleviate *snxA* defects, and studies are currently underway to evaluate the effects of *del-hstA*, singly and in combination with the other two HDAC deletions.

Isolation and characterization of Butrico1 species from right pointer and middle finger

Student(s):

Casey Butrico

Mentor(s):

Jennifer Powell

Time/Location:

4:00pm - 5:30pm

College Union Ballroom

Characteristic bacteria on external sites of human epithelial surfaces allow for the comparison of types of bacteria and their metabolic character. Isolation and purification of a novel bacterial strain, Butrico1, from the interdigital web space between the right pointer and middle fingers was purified and classified with PCR amplification and Blast analysis. The metabolic characteristics, antibiotic sensitivity, physical structure, and growth rate were analyzed. Classification of Butrico1 established possibilities to further research the interactions it has with human keratinocytes and the role in which it has in the extensive epithelial microbiome. As a member for the interdigital web space niche, Butrico1 contributes to the habitability of the site and influences other microbiota with its metabolic byproducts and adaptive advantages. Isolating and analyzing Butrico1 provides an opportunity for insight into the diversity of novel strains of bacteria and how they grow, interact with other cells, and respond to stimuli.

Isolation and Characterization of an Interdigital Bacterial Species

Student(s):

Aden Lessiak

Mentor(s):

Jennifer Powell

Time/Location:

4:00pm - 5:30pm

College Union Ballroom

The human body is home to over 10^{14} bacterial, viral, and fungal cells, collectively known as the human microbiome. These cells primarily inhabit the intestinal tract, mucous membranes, and the surface of the skin. Recently, shifts in microbial community composition have been implicated in non-infectious skin diseases such as acne, atopic dermatitis, and psoriasis. To best understand the role of resident microbes in disease, we must first gain insight into the microbial communities of healthy individuals. The present study aimed to identify normal bacteria living on the surface of the skin in the interdigital spaces. A single strain was isolated and identified based on cell and colony morphology, Gram status, metabolic capabilities, antibiotic sensitivity, growth rate, and 16S rRNA gene sequencing.

Isolation and Characterization of JKK-1 from the left outer ear of a healthy 21-year-old female

Student(s):

Jenna Kobett

Mentor(s):

Jennifer Powell

Time/Location:

4:00pm - 5:30pm

College Union Ballroom

The purpose of this study was to isolate and characterize a novel microbial strain acquired from the outer ear of a healthy 21-year-old female. JKK-1 was sampled from the pinna of the left ear and was not hypothesized to be pathogenic. However, based on previous findings, it is possible that JKK-1 may possess genetic similarities to common middle ear microflora which are potentially pathogenic organisms. The identification of JKK-1 involved extensive metabolic testing including presence of cytochrome c oxidase, production of catalase, nitrate reduction, glucose fermentation, lactose and/or sucrose fermentation, gas production, hydrogen sulfide production, mannitol fermentation, and starch hydrolysis. Additionally, JKK-1 was tested for antibiotic sensitivity to five common antibiotics, erythromycin, penicillin, tetracycline, rifampin, and vancomycin. The outer ear isolate also underwent molecular species identification via 16s rRNA sequencing, phenotypic species identification, and growth curve analysis. JKK-1 16s rRNA sequencing data is still being processed, therefore characterization of JKK-1 is still being determined.

Isolation and Characterization of Novel Bacterial Strains

Student(s):

Alecia Achimovich

Mentor(s):

Jennifer Powell

Time/Location:

4:00pm - 5:30pm

College Union Ballroom

Though bacteria are often aggressors of disease, they are also important for the maintenance of bodily homeostasis. In order to better understand bacteria and its role in health, the Human Microbiome Project was launched in 2007 as an initiative to isolate and characterize the microorganismal residents. The study conducted here is less extensive and represents the surface of the skin, but the end-goals are similar. Novel strains of bacteria were isolated from the subungual space of the hand as well as the supra alar crease of the nose and subjected to various metabolic assays as well as 16s rDNA sequencing for further definition and comparison to previously established epidermal microbiota.

Isolation and characterization of novel skin microbiotic strains from the antecubital fossa, popliteal fossa, and dorsal forearm of a healthy adult male

Student(s):

Alex Lupolt

Mentor(s):

Jennifer Powell

Time/Location:

4:00pm - 5:30pm

College Union Ballroom

The human skin is a diverse landscape that is composed of distinct ecosystems capable of supporting a great variety of microbial life. The skin microbiota contribute to the physiology of the skin often in a symbiotic manner, aiding in the body ' s defenses to pathogens and overall health of the human host. The skin environment is variable, displaying different pH, temperatures, and antimicrobial actions with different skin locations. Sebaceous, moist, and dry skin habitats provide distinct niches for which unique microbes can grow in healthy individuals. Characterization of a normal skin microbiome is difficult because microbial communities are often unique to the individual.

In isolated strains, colony and cell morphology, Gram status, metabolic characteristics, antibiotic sensitivity, growth curves and other phenotypic characteristics were assessed. Genetic identification of the isolated forearm species will provide a phylogenetic perspective of the isolated novel strain and aid in its classification.

Since there are likely many interpersonal differences between various skin habitats, the study of the microbiota that live in these environments could lead to isolation of novel strains/species of bacteria, and could elucidate symbiotic or pathogenic interactions between the normal skin microbiota and its host. The purpose of this experiment was to isolate, characterize, and identify possibly novel bacterial strains from the human skin microbiome on a healthy adult male in the antecubital fossa, popliteal fossa, and dorsal forearm, in order to understand how different skin habitats may offer niches for microbial species and may provide the basis for phenotypic differences or commonalities between strains.

Isolation and characterization of Staphylococcus aureus from under the left index fingernail

<u>Student(s):</u>	<u>Mentor(s):</u>	<u>Time/Location:</u>
Morgan Patullo	Jennifer Powell	4:00pm - 5:30pm College Union Ballroom

Through a multi-week research project, an unknown microbe was isolated from under the left index fingernail, identified, and a preliminary characterization was performed. The Gram status of the unknown microbe was determined and the cellular and colony morphology was described. The microbe was then assayed against to a panel of antibiotics to determine antibiotic resistance, and its biochemical respiration abilities were measured through a set of tests. The microbe was characterized by determining a growth curve with doubling time, and by using bacterial identification technology to determine the species identify of the microbial strain.

Isolation and Characterization of the Microflora in the Human Fingernail

<u>Student(s):</u>	<u>Mentor(s):</u>	<u>Time/Location:</u>
Colleen Oleynik	Jennifer Powell	4:00pm - 5:30pm College Union Ballroom

A sample of bacteria was taken from the subungual region of the fingernail of a 21-year-old female. A strain of bacteria, CMO-1, was isolated from this sample. This unknown isolate was phenotypically characterized and exposed to multiple laboratory tests in attempt to determine the Gram status, metabolic activity, antibiotic sensitivity, growth curve and generation time. PCR amplification and sequencing were used for species identification of CMO-1. Following the analysis of these results, it was determined that CMO-1 is gram positive, cocci, staining purple. CMO-1 was susceptible to Penicillin, Vancomycin, Rifampin, Tetracycline, and Erythromycin. CMO-1 was observed negative for all metabolic tests with the exception of mannitol fermentation and observed yellow in acidification of TSI medium for both the slant and butt. With this increased understanding, this strain of bacteria can now be targeted to decrease the risk of nosocomial infections during surgery.

Isolation, Characterization, and Identification of an Unknown Microbacterial Strain found on the Epidermis

<u>Student(s):</u>	<u>Mentor(s):</u>	<u>Time/Location:</u>
Zachary Moser	Jennifer Powell	4:00pm - 5:30pm College Union Ballroom

Many strains of microbiota are undocumented and researchers attempt to document them in order to build a complete evolutionary history of microorganisms. This experiment has aided in that goal by isolating, characterizing, and finally identifying a strain of bacteria found on the back of the neck, beneath the hairline of this researcher; the strain is known as ZRM-1. A number of tests were performed on the isolated bacteria including characterizing bacterial cell colony and morphology, gram staining, metabolic characterization, antibiotic sensitivity, gel electrophoresis tests, PCR purification, CFU count to find growth rate, and spectrophotometric determination to find growth rate. Colony morphology of ZRM-1 was found to be white, punctiform, smooth, dull, circular, convex, and entire. Cell morphology was gram positive and staphylococci. ZRM-1 does not produce cytochrome c or catalase. It was not able to reduce nitrates. It did not produce gas or hydrogen sulfide and it did not metabolize glucose, lactose, or sucrose aerobically or anaerobically. It did not grow on a MacConkey Agar. It did grow on a Mannitol Salt Agar but did not ferment the mannitol. It also did not hydrolyze starch. ZRM-1 was susceptible to the antibiotics erythromycin, penicillin, and vancomycin but resistant to rifampin and tetracycline. ZRM-1 had a strong band of DNA at the 16S rDNA gene. Concentration of the DNA was found to be 90.2 ng/μl and 260/280 score was 0.85. Evolutionary cousins and growth rate of ZRM-1 have yet to be determined. Therefore the final identity of ZRM-1 is still unknown.

Isolation, Characterization, and Identification of Staphylococcus Bacteria Cultured from Subungual Region of Thumb Nail

<u>Student(s):</u>	<u>Mentor(s):</u>	<u>Time/Location:</u>
Jaclyn Turet	Zakiya Whatley	4:00pm - 5:30pm College Union Ballroom

Isolated, characterized, and identified a bacterial specimen that was swabbed from the subungual region of the fingernail in order to understand more about human microflora. The subungual region was honed in on in this study because microbiomes vary significantly from person to person in this region due to differences in exposures and hand hygiene practices (Ladizinski et al. 2014). The nail region is often neglected in typical hand washing practices and can entrap and house bacteria and although many studies have been done to look at the bacterial composition of the subungual fingernail region in healthcare workers, very little research has been done on the subungual bacterial composition of non-healthcare workers. In this study, differential bacterial characteristics such as gram stain and metabolic characteristics such as oxidase production, catalase production, nitrate reduction, lactose fermentation, mannitol fermentation, starch hydrolysis, and antibiotic sensitivity were used as clues with which to identify the unknown bacterial strains that were growing in the subungual region of a non-healthcare worker. The bacteria that were isolated, cultured, and tested from the subungual region of the fingernail had characteristics that were unique in comparison to bacteria swabbed from other external regions of skin. The results of the gram stain and metabolic tests appeared to indicate that a bacterium from the genus *Staphylococcus* was the unknown bacterial species that had isolated from under the fingernail.

Opposing Effects of FSHR-1 on Immunity and Cold Stress Response in *C. elegans*

<u>Student(s):</u>	<u>Mentor(s):</u>	<u>Time/Location:</u>
Joseph Robinson	Jennifer Powell	4:00pm - 5:30pm College Union Ballroom

All organisms are exposed to a range of stressors as they encounter changes in their environments. In order to adapt to these stressors, the organism needs to detect the presence of a stressor and then appropriately respond to that stressor. However, certain responses to a given stressor may increase the susceptibility of the organism to another stress. We have determined that a mutant which is known to be immunodeficient demonstrates a marked resistance to cold stress. We are exploring the possibility of a causal link between these two phenotypes. We hypothesize that the cold stress response, if inappropriately activated, could lead to a reduction in immune function.

Righting behavior of aquatic snails under the influence of anti-depressants

<u>Student(s):</u>	<u>Mentor(s):</u>	<u>Time/Location:</u>
Stephanie Adamczak	Peter Fong	4:00pm - 5:30pm College Union Ballroom

Pharmaceuticals and personal care products have been detected in wastewater effluent in waterways around the world. Of these chemicals, antidepressants have been noted as having adverse effects on aquatic species. This study examines the effect of four antidepressants, fluoxetine (Prozac), sertraline (Zoloft), citalopram (Celexa), and venlafaxine (Effexor), on righting behavior of the mudsnail *Lymnaea stagnalis*. All drugs were tested at a concentration of 10⁻⁵ M, except fluoxetine which was also tested at 10⁻⁶ M, 10⁻⁸ M, and 10⁻⁹ M. Fluoxetine 10⁻⁶ M had the most significant impact on slowing the righting response, followed by sertraline 10⁻⁵ M, fluoxetine 10⁻⁵ M, fluoxetine 10⁻⁸ M, citalopram 10⁻⁵ M, and fluoxetine 10⁻⁷ M. Venlafaxine 10⁻⁵ M and fluoxetine 10⁻⁹ M showed no significant difference in righting time, however all four antidepressants displayed a trend of increased righting time with the introduction of the drugs. These concentrations are higher than environmental concentrations, however the results are still relevant due to the bioaccumulation of these chemicals in the tissues of aquatic organisms due to chronic exposure.

β -glucuronidase inhibition in kombucha, a fermented tea: Determining the quantity and effect of D-saccharic acid 1,4-lactone production under varied fermentation conditions

<u>Student(s):</u>	<u>Mentor(s):</u>	<u>Time/Location:</u>
Stacey Heaver	Gregory Krukonis	4:00pm - 5:30pm College Union Ballroom

Kombucha is an acidic fermented sweet tea populated by a symbiotic colony of bacteria and yeasts (SCOBY) that has long been touted as a health promoting beverage. Despite its current popularity and commercialization, the microbial population is unstandardized and varies greatly between different kombucha cultures. Some kombucha cultures produce D-saccharic acid 1,4-lactone (DSL), a product of the glucuronate pathway that may ultimately prevent the release of bound toxins back into the body. DSL is a competitive inhibitor of β -glucuronidase; β -glucuronidase activity is necessary for the colonic genotoxicity of certain foodborne carcinogens and is overexpressed in colon and bladder cancer. While some kombucha cultures produce up to 3.20 mg/mL of DSL, other cultures produce no detectable levels (Wang Y et al. 2014, Wang K et al. 2010). The goals of this study were to (1) develop a capillary electrophoresis method to quantify DSL from kombucha samples, (2) determine the effect of different tea substrates on DSL production in three commercial kombucha cultures, both as-is and amended with *Gluconacetobacter saccharivorans* LMG 1584, a bacteria closely related to one known to produce high levels of DSL in kombucha, (3) determine the effect of kombucha extract on growth trends of *G. saccharivorans* LMG 1584, and (4) assay β -glucuronidase inhibition in as-is and amended kombucha cultures using fluorescent substrate and *E. coli* enzyme expression.

The Effect of Lactate Dehydrogenase Inhibition on the Warburg Effect in B16-F10 Mouse Melanoma Cells

<u>Student(s):</u>	<u>Mentor(s):</u>	<u>Time/Location:</u>
Stacey Blannett	Ralph Sorensen	4:00pm - 5:30pm College Union Ballroom

In 1956, Otto Warburg discovered that cancer cells exhibit an altered metabolism in comparison to normal cells (Warburg et al. 1956). The “ Warburg Effect ” is the term used to describe an increase in glycolysis and enhanced lactate production exhibited in cancer cells. It is essentially the uncoupling of glycolysis from oxygen levels. Cancer cells favor glycolysis instead of oxidative phosphorylation, even in highly aerobic environments (Fan et al. 2011). Normal cells undergo glycolysis only when they are in oxygen-deprived environments (Shim et al. 1997). Warburg proposed that cancer cells predominantly use glycolysis due to suppression of mitochondrial metabolic activities and that impaired mitochondrial function contributes to tumorigenesis. I have tested B16-F10 murine melanoma cells for generation of lactate. The rate of glycolysis was quantified in these cells. It was found that the inhibition of LDH-A forces oxidative phosphorylation, thereby reducing cell proliferation. B16-F10 cells were studied in the following environments; control and LDH-A inhibition. This research will work as a baseline for further research on B16-F10 murine melanoma cells. Cell proliferation was quantified with a hemocytometer. Lactate production was evaluated by means of a colorimetric assay. Expression of LDH-A was inhibited through the use of sodium oxamate. Sodium oxamate, is known to inhibit L (+)- lactate dehydrogenase. Sodium oxamate has been used in studies as an inhibitor of glycolysis in cells. It acts by competing with pyruvate through combining with the enzyme-reduced diphosphopyridine nucleotide complex to form an inactive ternary complex.

The effect of non steroidal anti-inflammatory drugs on the regenerative abilities of Lumbriculus variegatus

<u>Student(s):</u>	<u>Mentor(s):</u>	<u>Time/Location:</u>
Abigail Dworkin-Brodsky	Peter Fong	4:00pm - 5:30pm College Union Ballroom

The addition of common pharmaceuticals to marine and freshwater environments has become an issue in recent years. The long term effects of these drugs on the organisms in these environments is not yet fully understood. Non steroidal anti-inflammatory drugs, including ibuprofen, naproxen and diclofen, we administered to freshwater worms and their regenerative abilities were measured over the course of nine days. Significant differences between control and experimental worms new segment growth could be seen on day five in most experiments, but not generally on any other day. The nature for these differences is not yet clear.

the effects of intracranial infusions of oxytocin into the amygdala on play and anxiety in adolescent rats

Student(s):

Caroline Garliss

Mentor(s):

Stephen Siviyy

Time/Location:

4:00pm - 5:30pm

College Union Ballroom

Play behavior in animals has been studied in correlation to its importance in social development. During adolescence, the greater amount of play behavior exhibited by the animal, the more emotionally developed that animal becomes later in life. The playful adolescent model rat provides observation material. Anxiety is a detriment to the progress of playful behavior. This quality is analyzed through an experimental structure called the elevated plus maze. The central amygdala regulates stress responses, emotional behaviors and anxiety. By manipulating the amygdala and decreasing anxiety, rats might have more motivation to exhibit social behaviors. The Fischer 344 rat strain when compared to the Lewis strain and the Sprague-Dawley strain of rat is more anxious and less playful. By using this strain of rat as a model for play, the mechanisms and genetic reasons behind anxiety and dysfunctional play can be addressed. Oxytocin is a steroidal hormone found in both rat and human bodies that has a significant effect on social experiences, anxiety and other behaviors. Widely known for its maternal role in reproduction and child care, Oxytocin has only recently been studied in terms of neurological functioning. It was found that oxytocin increased social play when injected in rats. Since F344 rats are known to display a significantly less play behavior and more anxiety than other rat strains, it could be concluded that more oxytocin hormone in the brains and more specifically the amygdala of F344 rats could be beneficial to their social development and expressed social behavior.

The isolation and identification of a bacterial strain from the forearm

Student(s):

Mary Pearce

Mentor(s):

Jennifer Powell

Time/Location:

4:00pm - 5:30pm

College Union Ballroom

The human body provides an ideal environment for the growth of millions of microbes, the most prominent of which are bacteria. The human skin alone contains an extremely diverse microbiome that varies between individuals, as well as between different skin sites on the body. This diversity and the implications it has for human health are an active area of study. The purpose of this study was to isolate and identify a strain of bacteria from the forearm of an individual. The forearm was the chosen site due to its frequent contact with the environment and potential to contain a wide variety of bacteria. A series of tests was used to determine different characteristics of the bacterial isolate, including its metabolic lifestyle and antibiotic sensitivity. The genome will be purified and sequenced to further identify the bacteria.

**THE ISOLATION AND IDENTIFICATION OF A NOVEL HUMAN SKIN MICROBE
FROM THE FOREHEAD**

<u>Student(s):</u>	<u>Mentor(s):</u>	<u>Time/Location:</u>
Jennifer Beggan	Jennifer Powell	4:00pm - 5:30pm College Union Ballroom

Different bacterial strains live on human skin. The various parts of the body contain different microbiome communities. Using a wet cotton swab a bacterial sample was obtained from a single patient ' s forehead. The novel strain from the forehead was isolated and analyzed. A variety of tests were performed to help characterize this strain. The gram status, cellular morphology, colony morphology, antibiotic sensitivities, biochemical respiration abilities and a growth curve were determined. The 16S rDNA gene of the microbe was amplified and sequenced. The data will be analyzed using BLAST. The novel strain will be compared to other strains and placed on a phylogenetic tree. The overall purpose of the present study was to identify the novel bacterial strain from a forehead sample.

The Isolation, Characterization, and Identification of Human Hand Epithelial Micro Flora

<u>Student(s):</u>	<u>Mentor(s):</u>	<u>Time/Location:</u>
Joshua Pettengill	Jennifer Powell	4:00pm - 5:30pm College Union Ballroom

The symbiotic relationship between micro flora and the human host is a complex ecosystem. Current research of resident epithelial bacteria on human hands is limited and further characterization of skin microbiota is necessary. In this study, the isolation, characterization, and identification of resident human hand micro flora, JNP-1 is reported. JNP-1 colony morphology was large, undulate, and irregular with tan pigment. JNP-1 was found to be Gram positive with bacillus cell morphology. JNP-1 metabolic characteristics included absence of cytochrome c oxidase, absence of catalase activity, inability to reduce nitrates, ability to catabolize glucose but not sucrose and lactose, with no gas (CO₂ or O₂) or H₂S production. JNP-1 had starch hydrolysis ability, though was unable to ferment mannitol. JNP-1 displayed vast antibiotic resistance, specifically to penicillin, rifampin, tetracyclin, and vancomycin, while only showing susceptibility to erythromycin. A growth curve as well as both molecular and phenotypic species identifications are to be conducted. The final identity of JNP-1 has not yet been concluded.

The Role of FSHR-1 in the skn-1 Mediated Oxidative Stress Response in C. elegans

<u>Student(s):</u>	<u>Mentor(s):</u>	<u>Time/Location:</u>
Theresa Menna	Jennifer Powell	4:00pm - 5:30pm

The innate immune system is responsible for the general short-term response of an organism to infection. In addition to infection, numerous factors trigger the innate immune response, including infection-independent stressors such as injury. Infection can also cause oxidative stress; therefore, it is hypothesized that one mechanism by which the innate immune system detects infection is by sensing the damage done by oxidative stress. *C. elegans* are an excellent model organism with which to study innate immunity. In *C. elegans*, the gene *skn-1* encodes a transcription factor that regulates the expression of multiple genes important for the oxidative stress response and immunity. Under regular conditions, SKN-1 is located in the cytoplasm; however, under stress, it translocates to the nucleus. FSHR-1 is a G-Protein Coupled Receptor that is important for the innate immune response to infection, but its exact mechanism is also unknown. *fshr-1(-)* mutant *C. elegans* fail to induce an oxidative stress response upon infection, so we hypothesize that FSHR-1 acts in the *skn-1* pathway. To investigate this, we are constructing a strain of *C. elegans* that lacks the FSHR-1 receptor and contains a transgene with the *skn-1* gene tagged with GFP. This strain will allow us to trace the location of the SKN-1 transcription factor from cytoplasm to nucleus and to determine whether FSHR-1 acts in the SKN-1 pathway.

The Role of the G-protein Coupled Receptor FSHR-1 in Pathogen Avoidance Behavior

<u>Student(s):</u>	<u>Mentor(s):</u>	<u>Time/Location:</u>
Jennifer Giannini	Jennifer Powell	4:00pm - 5:30pm College Union Ballroom

Innate immunity is the first line of defense against attack by pathogenic microorganisms. While traditionally, immunity is thought of as being able to fight off infection; part of the innate immune response can be preventing infection by avoiding exposure to pathogens. *Caenorhabditis elegans* are a model animal host for studying many facets of immune response. Wild *C. elegans* are constantly exposed to a variety of bacteria, some of which are a source of nutrition while others are harmful. Thus, having an effective way of differentiating pathogens and eliciting a behavioral response to avoid infection is crucial to the survival of *C. elegans*. The G-protein coupled receptor FSHR-1 is known to play an important role in the response to infection by diverse pathogens. Recent discoveries suggest FSHR-1 also has a role in pathogen avoidance behavior. To explore this role, the tissue in which FSHR-1 functions must first be determined. After this, we can begin to explore whether FSHR-1 acts more generally in the discrimination of abiotic stimuli or is specific for differentiating pathogenic versus nonpathogenic bacteria.

Center for Global Education

Being a Global Leader of Gettysburg College

<u>Student(s):</u>	<u>Mentor(s):</u>	<u>Time/Location:</u>
Madeline Price	Daniel Albertson	4:00pm - 5:30pm College Union Ballroom

After returning from studying abroad in Panama last fall, I applied to join the Global Leaders of Gettysburg College because I wanted to connect with other returned students as interested in sharing their experiences as me and to provide guidance to students considering studying abroad. With my poster, I reflect on my experiences with the GLGC and as a returned study abroad student at Gettysburg.

GLGC Poster

<u>Student(s):</u>	<u>Mentor(s):</u>	<u>Time/Location:</u>
Stephanie Buff	Daniel Albertson	4:00pm - 5:30pm College Union Ballroom

The poster will incorporate my time spent studying abroad and how the GLGC has permitted me to apply that experience to the campus community.

GLGC: Campus Community Leadership through the Reflection of a Global Experience

<u>Student(s):</u>	<u>Mentor(s):</u>	<u>Time/Location:</u>
Madison Senseney	Daniel Albertson	4:00pm - 5:30pm College Union Ballroom

As a member of the GLGC (Global Leaders of Gettysburg College), I have had the opportunity to deconstruct, construct, and reflect upon my experience abroad in Copenhagen, Denmark. The GLGC has provided us with the resources to analyze our experience abroad and situate newly learned, global knowledge within the context of our leadership on campus at Gettysburg College.

Global Gettysburg: Growing from my Experiences Abroad with Global Leaders of Gettysburg College

<u>Student(s):</u>	<u>Mentor(s):</u>	<u>Time/Location:</u>
Erin O'Connor	Daniel Albertson	4:00pm - 5:30pm College Union Ballroom

After studying abroad in Copenhagen, Denmark the fall of my junior year, Global Leaders of Gettysburg College (GLGC) encouraged me to reflect on my experiences and to continue growing and learning from them even after being back in the States and at Gettysburg. GLGC's three pillars (scholarship, mentorship, and activism) helped transform me into a global citizen and leader.

Global Involvement: My Experience with the Global Leaders of Gettysburg College

<u>Student(s):</u>	<u>Mentor(s):</u>	<u>Time/Location:</u>
Dayna Seeger	Daniel Albertson	4:00pm - 5:30pm College Union Ballroom

I will be presenting a poster that identifies and explains how my experience with the Global Leaders of Gettysburg College, in conjunction with the Center for Global Education and the Garthwait Leadership Center, helped me to apply my experience abroad to global involvement on campus.

Global Leaders of Gettysburg College - A Culmination Summary

<u>Student(s):</u>	<u>Mentor(s):</u>	<u>Time/Location:</u>
Christopher Lasek	Daniel Albertson	4:00pm - 5:30pm College Union Ballroom

As a culmination of my experience with GLGC and my time here at Gettysburg College, my discussion will be focused on my time in the GLGC and what I have experienced. I will elaborate on how I have connected my global experience with the campus community.

SIT Morocco: Connecting Global Experience and Campus Community

<u>Student(s):</u>	<u>Mentor(s):</u>	<u>Time/Location:</u>
Cassandra Mensinger	Daniel Albertson	4:00pm - 5:30pm College Union Ballroom

This poster is a culmination of my experience with GLGC and my time at Gettysburg College. The poster focuses on what I got out of my abroad experience and my GLGC experience back on campus, and how I was able to connect my global experience to my life back at Gettysburg.

Center for Public Service

Anything is PAULssible, The Sky is the Limit: Honoring one of Gettysburg's Greatest through a 5k

<u>Student(s):</u>	<u>Mentor(s):</u>	<u>Time/Location:</u>
Sara Moyer, Sophie Kashurba	Leonora Gatto	4:00pm - 5:30pm College Union Ballroom

On June 13, 2013, Paul Detweiler, a Gettysburg student, lost his life to an aggressive brain tumor. Paul was an active member on campus, participating in Alpha Phi Omega and taking on a health science major. Being here only two semesters, he gained Dean 's List Commendation both semesters. One of his biggest dreams was to put on a 5k while at Gettysburg College because of his love for running and the college in general. With the help of Alpha Phi Omega and Alpha Chi Rho, Sophie Kashurba and I were directors in the process of making this 5k happen on campus. Last year, there were 326 people who signed up. We were able to raise over \$2,500 for the Paul Detweiler Memorial Scholarship, where all the funds go, implemented by Janet Morgan Riggs in 2013. This year, with the help of 25-person committee, we have worked tirelessly since the beginning of September to make sure this year was even better than the last. In the process, we 've formed bonds with the college community, from Greek life to sports teams, as well as Paul 's community and family at home. Working on this the past two years has been one of the most invaluable experiences of our lives, something that we will certainly take with us after graduation. This 5k will ensure that the Paul Detweiler spirit lives on.

Chemistry

Adjustable Leakage of pH-Sensitive Small Unilamellar Vesicles by Varying Cationic and Anionic Lipid Ratios

<u>Student(s):</u>	<u>Mentor(s):</u>	<u>Time/Location:</u>
David Van Doren, Sarah Hansen	Kurt Andresen Shelli Frey	4:00pm - 5:30pm College Union Ballroom

To avoid the risk of potentially dangerous drug side effects, new methods of drug targeting and delivery that reduce exposure to healthy tissue but maintain therapeutic effects to unhealthy tissue are necessary. Much attention has been given to liposomal delivery systems for their biocompatibility and biostability. Because there are many possible components available for liposomal construction, the properties and uses for these vehicles are diverse. While liposomes are capable of carrying drugs, a mechanism for triggered delivery is crucial to regulate when and where the drugs are administered. For instance, delivery systems with pH-sensitive constructions offer controllable permeabilization of liposomal membranes dependent on the pH environment. This method exploits the more acidic environments of particular targets, such as tumors, to induce delivery. This study focuses on the content leakage from small unilamellar vesicles (SUVs) composed of a mixture of cationic and anionic lipids, which contribute to liposomal pH-sensitivity. The permeabilities of vesicles with differing ratios of cationic 1,2-dioleoyl-3-trimethylammonium-propane (DOTAP) to anionic cholesteryl hemisuccinate (CHEMS) were analyzed at several acidic conditions through fluorometry and dynamic light scattering (DLS) measurements. Using these methods, the pH-sensitivity associated with varying lipid ratios was optimized for biologically relevant pH values. Furthermore, pH-sensitive fusion experiments may provide insight into model cytoplasmic drug delivery.

Characterizing the Partitioning of Hydrophobic Solutes into the Surfactant Bilayer on Gold Nanorods

Student(s):

Ida DiMucci

Mentor(s):

Lucas Thompson

Time/Location:

4:00pm - 5:30pm

College Union Ballroom

In recent years the applications of gold nanoparticles in biological and medical fields such as photothermal therapy and drug delivery have increased drastically. However, there is little fundamental understanding of how these nanoparticles interact with small molecules inside and outside of the body. Our work focuses on the interactions of small hydrophobic solutes with the surfactant bilayer of gold nanoparticles. The nanoparticles are synthesized via a seed mediated growth mechanism, which utilizes cetyltrimethylammonium bromide (CTAB) as the capping agent, and results in a surfactant bilayer of CTAB on the surface of the gold. The goal of this research is to determine the partitioning coefficient of hydrophobic molecules into the CTAB bilayer of both nanospheres and nanorods. The molecules, 1,5-dihydroxynaphthalene and 2,3-dihydroxynaphthalene have been used to determine the amount of molecule that partitions at a specific gold nanoparticle to molecule ratio. By determining the partitioning of the molecule at several ratios both the partitioning coefficient (K) and the number of molecules that partition into the surfactant bilayer (Cmax) can be determined. Preliminary results suggest that the differences in size and polarity of the 1,5-dihydroxynaphthalene and 2,3-dihydroxynaphthalene cause a significant difference in the K and Cmax values of these molecules. This gives insight about the impacts that molecular properties have on the partitioning of molecules into the bilayer. In addition, data shows that differences in the partitioning between spheres and rods also exist. Through the use of these partitioning experiments, it will be possible to indirectly probe the structure of the CTAB bilayer.

Effects of cations on the material properties of model cell membranes and nanoparticles on stratum corneum

Student(s):

Michael Counihan

Mentor(s):

Shelli Frey

Time/Location:

4:00pm - 5:30pm

College Union Ballroom

The outer leaflet of a cell membrane can be modeled with a lipid monolayer, of which the structure and material properties can be measured as a function of lipid composition, insertion of macromolecules (peptides or nanoparticles), and ion presence, among other variables. Cation effects on these monolayers are not fully characterized, especially at higher ion concentrations. Due to the greater number of biologically relevant multivalent cations, these promise to be more complex than well-understood anion effects. Since biological processes take place in buffered environments, an understanding of ion effects on lipid macromolecular structures is necessary to study fundamentals of cell membrane interactions. This research showed that low cation concentrations stiffen a monolayer while high concentrations fluidize it.

Nanoparticles are particles smaller than the width of a human hair. Being so small, they can intercalate into many systems and interrupt normal processes. However, with nanoparticles becoming ever more present in our lives (in lotions, clothing, medicine), it is important to characterize their interaction with the human body. The stratum corneum is the outermost layer of mammalian skin and consists of corneocytes (dead cells) in an extracellular lipid matrix of fatty acids, cholesterol, and ceramides. It is the first barrier to the environment and expands and contracts naturally. This research is investigating the effects that different types of nanoparticles (metal oxides, gold nanoparticles, and functionalized polymers) have on the structure and material properties of the human stratum corneum. These effects are investigated with lipid monolayers and fluorescence microscopy.

Impact of cyclopentadienone substitution on the activity of (cyclopentadienone)iron tricarbonyl catalysts

Student(s):

Daniel Ruff, Kathryn Fodale

Mentor(s):

Timothy Funk

Time/Location:

4:00pm - 5:30pm

College Union Ballroom

Replacing precious metal catalysts with those containing earth-abundant metals has become a major focus of 21st century chemical research. Along those lines, in 2007 Casey and Guan reported that an air-sensitive iron hydride originally synthesized by Knölker's group catalyzed the reduction of carbonyl compounds through a mechanism similar to that of Shvo's diruthenium bridging hydride. An air-stable cyclopentadienone(iron) tricarbonyl precursor to the iron hydride, also synthesized by Knölker's group, has also been shown to be an active catalyst in a variety of organic oxidation and reduction reactions. The cyclopentadienone substitution has been shown to dramatically alter the activity of this class of catalysts, and there have been few studies systematically exploring this impact. In this study, a series of cyclopentadienone(iron) tricarbonyl compounds bearing cyclopentadienones with varying substitution have been synthesized, and the catalytic activity of each compound has been tested in six organic oxidation and reduction reactions. The impact of steric and electronic variations on catalyst activity will be presented.

Investigating DNA-lipid interface interactions using Langmuir monolayers

<u>Student(s):</u>	<u>Mentor(s):</u>	<u>Time/Location:</u>
Adam Poff, Dina Mohamed-Aly, Madison Lacroce	Kurt Andresen Shelli Frey	4:00pm - 5:30pm College Union Ballroom

In this study, we look at the electrostatic interactions between dsDNA and a model nuclear lipid monolayer using a Langmuir trough. Zwitterionic and negatively charged phospholipids make up the majority of cellular membranes with the most common phosphate head groups used being phosphatidylcholines (PCs), phosphatidylethanolamines (PEs), phosphatidylinositols (PIs), and phosphatidylserines (PSs). Although these groups are common in all membrane types, the ratio of polar head groups varies from organism to organism and tissue to tissue in higher eukaryotes. DNA-lipid interactions have been studied extensively to improve gene delivery methods but much remains to be uncovered regarding the structure and thermodynamics of the interaction. In addition, most studies utilize cationic lipids which are not naturally occurring and can thus pose harm to the cell due to the acidic environment in which these genes are contained and the charged surface of the lipid layer. In order to understand the physical and electrostatic associations between nucleic acids and phospholipids we will vary the lipid monolayer composition using mixtures of PC, PE, PI, and PS modeling nuclear and cellular membrane compositions, as well as the counterion charge using Mg²⁺, Ca²⁺, and K⁺ ions, and perform surface pressure-area isotherm experiments. We use this data to explore the electrostatic interactions between DNA and the lipid monolayer which may have implications for biotechnology, improved gene delivery techniques, and information on DNA-membrane association.

Investigating the interactions between gold nanoparticles and *L. catebeianus* and *L. sylvaticus*

<u>Student(s):</u>	<u>Mentor(s):</u>	<u>Time/Location:</u>
Laura Lee	Lucas Thompson	4:00pm - 5:30pm College Union Ballroom

Nanoparticle technology is widely utilized in today ' s society and shows a pattern of increasing use. In 2013, the Project on Emerging Nanotechnologies reported their updated Nanotechnology Consumer Products Inventory contained 1,628 consumer products, a 24% increase from 2010. With a rapid increase in nanoparticle technology, it is likely that more nanomaterials will enter the environment through manufacturing waste, landfills, and runoff. The effect of nanoparticles entering the environment and interacting with land, water and animal systems is still widely unknown. Bioaccumulation of nanoparticles and the potential for toxic effects at increasing levels could be a concern across the food chain. In this research, gold nanoparticles were utilized due to their relative inertness, minimal toxicity, and low environmental background. The aim of this study was to quantify the uptake of gold nanoparticles in varying sizes of tadpoles, *L. catesbeianus* (bullfrogs) and *L. sylvaticus* (wood frogs), as model organisms that would most likely encounter nanoparticles in wastewater runoff.

Observations of Charged and Neutral Model Cell Membranes in the Presence of Salt

<u>Student(s):</u>	<u>Mentor(s):</u>	<u>Time/Location:</u>
Heather Garland, Justin Myers, Samuel Wilensky	Kurt Andresen Shelli Frey	4:00pm - 5:30pm College Union Ballroom

Giant unilamellar vesicles (GUVs) in the presence of salt has not been widely studied. Adding salt to a GUV solution can model the effects of salt on a cell membrane. GUVs are made by electroformation, a process where lipids are placed in the presence of oscillating electric fields. In the electroformation process, the presence of salt prohibits the formation of GUVs. It is known that salt prohibits GUV formation in electroformation. However, it is unknown how adding salt to a GUV solution after electroformation will affect the GUVs. Zwitterionic dipalmitoylphosphatidylcholine (DPPC) and dioleoylphosphatidylcholine (DOPC) GUVs were studied when the salt, NaCl, was added after electroformation. Negatively charged DOPC and diacylphosphatidylglycerols (DOPG) GUVs were also studied under the presence of NaCl. The salt percentage was varied about the natural percentage of salt in a human body, 0.4%. The salt percentages used in this study were 0.1%, 0.4%, 0.7%, and 1.0%. All GUVs were imaged using fluorescence microscopy to determine the concentration of GUVs without defects.

Synthesis of a Photo-cleavable Linker for Protein Purification

<u>Student(s):</u>	<u>Mentor(s):</u>	<u>Time/Location:</u>
Rowan Meador	Timothy Funk	4:00pm - 5:30pm College Union Ballroom

Many proteins undergo changes called post-translational modifications. The post-translational modification GlcNAcylation adds the compound beta-D-N-acetylglucosamine (GlcNAc) onto a protein. GlcNAcylation is related to phosphorylation, cell signaling, glucose uptake in skeletal muscle, type II diabetes, Alzheimer's, cancer, and a multitude of other ailments. Understanding the expression of GlcNAc in proteins can aid in the research for treatments of a variety of such diseases. Numerous methods have been developed to isolate and identify GlcNAcylated proteins from cell cultures. One efficient method covalently links GlcNAcylated proteins to an insoluble bead, which aids in their purification. Before the protein can be analyzed by mass spectrometry (to determine site-specifically where the GlcNAc was introduced), it must be removed from the bead. This is done using the BEMAD (β -elimination/Michael addition) procedure, but the conditions are harsh and protein degradation and dephosphorylation often occur. The overall goal of this project was to develop a chemical linker that covalently binds GlcNAcylated proteins to an insoluble bead and that uses a photochemical bead-cleavage method that does not damage the protein. The targeted compound is shown in figure 1, and the focus of this project was on the synthesis of the strained alkyne portion, which is needed to link the protein to the bead. While its synthesis has been published, low yields and impurities were encountered when the literature procedures were followed. Purification of an amide intermediate in the synthesis resulted in higher yields in the subsequent lithium aluminum hydride (LAH) reduction step. The LAH reduction was tested with different solvents and temperatures to improve yields. It was found that the use of diethyl ether at reflux was optimal.

Synthesis of Novel Pyrido Derivatives of Tröger's Base

<u>Student(s):</u>	<u>Mentor(s):</u>	<u>Time/Location:</u>
Manhao Zeng	Donald Jameson	4:00pm - 5:30pm College Union Ballroom

Inherently chiral concave molecules have drawn considerable attention because of their potential applications to areas such as supramolecular chemistry, ligand design, and binding site formation. Tröger's base (TB), for instance, is a chiral, bicyclic diamine consisting of two aromatic rings rigidly held at a 90 degree angle. Because of its unique V-shaped structure, this molecule has been investigated to serve as corner elements in the construction of metallosquares, cubic metallocages, and other complex, multifunctional supramolecules capable of enclosing chiral space. The classic, one-step synthesis of TB from anilines bearing electron-donating groups has been successful, especially for compounds with electron-donating groups in the para position. Applying this classic method to prepare TB molecules composed of aromatic pyridine rings, however, has been particularly challenging because of the electron-poor nature of these rings. In this project, a new, multi-step strategy has been devised to synthesize this novel class of electron-poor TB molecules more effectively. Of the four possible symmetric isomers of pyridine TB that exist, two isomers have been successfully prepared. Progress toward the synthesis of the remaining two isomers will be presented.

The effects of gold nanoparticles on model cell membranes.

<u>Student(s):</u>	<u>Mentor(s):</u>	<u>Time/Location:</u>
Celina Harris, Gordon McCann, Savannah Miller	Kurt Andresen Shelli Frey	4:00pm - 5:30pm College Union Ballroom

Gold nanoparticles have been investigated as a novel approach to drug delivery, gene therapy, and tumor imaging and detection. Additionally, in the past 10 years, gold nanoparticles have become a hot topic in dermatology and appear in several skin lotions targeted at reducing wrinkles and dry skin. Consequentially, the toxicity of gold nanoparticles in biological systems has become the topic of extensive research. Previous studies have shown the ability of polystyrene cationic nanoparticles to deform and create pores on synthetic cell membranes - a finding which indicates that nanoparticles could not only hinder a cell's functionality but also suggests the potential of nanoparticles to destroy cells entirely.

This research expands on the current understanding of cationic nanoparticle interactions by looking at the effects of positively-charged gold nanoparticles on model lipid membrane systems. The ultimate goal of this experiment is to shed some light on how these particles would interact with cell membranes and what impact those interactions would have on the health of the cell. During the experiment, Giant unilamellar vesicles (GUVs) were systematically exposed to gold nanoparticles with a variety of surface layers and imaged in real time using fluorescence microscopy.

The damage sustained by the GUVs in the presence of gold nanoparticles has been quantified and reported. The results will indicate the impact that gold nanoparticles have on cell membranes and give insight into the extent of nanoparticle-induced cell damage. This should aid in determining the safety of gold nanoparticles for use in pharmaceuticals and biomedical processes.

The role of protein and membrane context in the interaction of polyglutamine peptides with lipid membranes.

<u>Student(s):</u>	<u>Mentor(s):</u>	<u>Time/Location:</u>
Warren Campbell	Shelli Frey	4:00pm - 5:30pm College Union Ballroom

Huntington 's disease is a dominant genetic neurodegenerative disorder associated with motor and cognitive decline, caused by a mutation in the poly-glutamine (polyQ) region near the N-terminus of the huntingtin (htt) protein. Expansion of the polyQ region above 35-40 repeats results in the disease that is characterized by inclusion body aggregates of mutated protein. The polyQ expansion in htt is flanked by a 17 amino acid N-terminal sequence (Nt17) and a proline-rich (polyP) region. To investigate the interaction between htt exon1 and lipid membranes, a combination of Langmuir trough techniques and vesicle permeability assays measuring calcein leakage were used to directly monitor the interaction of a variety of synthetic polyQ peptides with different combinations of flanking sequences (KK-Q35-KK, KK-Q35-P10-KK, Nt17-Q35-KK, and Nt17-Q35-P10-KK) on total brain lipid extract (TBLE) model membranes. Nt17 facilitated the interaction of peptides with lipid surfaces while the polyP region enhanced this interaction. Our data suggests that the Nt17 domain plays a critical role in htt binding and aggregation on lipid membranes, and this lipid/htt interaction can be further modulated by the presence of the polyP domain. The addition of cholesterol, a primary neuronal plasma membrane component reduced in many Huntington ' s disease models, to the TBLE monolayer caused a notable condensing effect in the membrane at low surface pressures. This resulted in reduced peptide insertion into lipid monolayers and decreased levels of induced vesicle permeability, though the effect does not scale linearly with cholesterol concentration. Results from parallel studies on htt-membrane interaction with sphingomyelin will also be discussed.

Towards the synthesis of a photocleavable linker for GlcNAc-ligated protein purification

<u>Student(s):</u>	<u>Mentor(s):</u>	<u>Time/Location:</u>
Kevin Mrugalski	Timothy Funk	4:00pm - 5:30pm College Union Ballroom

Proteins routinely undergo post-translational modifications, which are crucial for their optimal function. One such post-translational modification introduces N- acetylglucosamine (GlcNAc) to certain serine and threonine residues. Determining site-specifically where the GlcNAc groups are is important to understanding the role they play in the regulation and function of proteins. Our goal is to synthesize a photocleavable linker that covalently binds to proteins bearing GlcNAc and aids in their purification. Once the proteins are purified, the linker will be removed photochemically before mass spectrometric analysis is done to determine site-specifically which serine and threonine residues bear GlcNAc groups. The photocleavable linker contains three important components: a strained alkyne, a photocleavable group, and an insoluble bead. The focus of our initial efforts has been on synthesizing a model of the targeted linker and exploring its photochemistry. We have found that an aminocoumarin bearing an ester undergoes a relatively clean, reliable photocleavage to afford a carboxylic acid. Our current focus is on introducing the strained alkyne to the aminocoumarin and exploring the behavior of the product. Future work will involve completing the synthesis by introducing the insoluble bead to the aminocoumarin/strained alkyne portion of the linker.

Computer Science

Casa de la Cultura Web Management System

<u>Student(s):</u>	<u>Mentor(s):</u>	<u>Time/Location:</u>
Jiangfeng Wang, Lee Sieger, Michael Kielbasa, Timothy Cook	Ivaylo Ilinkin	4:00pm - 5:30pm College Union Ballroom

Casa de la Cultura is a program of the Center for Public Service that promotes the cultural rights of immigrant communities on local, regional, and global levels through community activities and collaboration with governmental, academic, and community partners. The system allows Casa de la Cultura administrators to update and create events, manage attendance, and generate reports. The system allows for volunteers to assist the administrators in managing attendance and allows community members to view past and upcoming events.

Immersion Projects Management System: an online information system that simplifies routine work for the managing staff of the Immersion Projects

<u>Student(s):</u>	<u>Mentor(s):</u>	<u>Time/Location:</u>
Anna Kane, Matthew Kuhl, Wei Xiong	Ivaylo Ilinkin	4:00pm - 5:30pm College Union Ballroom

Immersion Projects are off-campus, educational service opportunities at sites in the United States and abroad, through which students learn about themselves and the world. Traditionally, most of the managing work is done with Google Docs and Microsoft spreadsheets, which has not been an efficient solution. IPMS (Immersion Projects Management System) is the new system that we developed to help the staff do their work in a more streamlined and integrated fashion to improve efficiency. The system is a web application built upon Laravel, a PHP-based framework.

Pocket Tour Guide: Creating an Android Application for Historical Tours

<u>Student(s):</u>	<u>Mentor(s):</u>	<u>Time/Location:</u>
John Duncan, Steven Semmel	Charles Kann	4:00pm - 5:30pm College Union Ballroom

This project is a combination between the computer science and history fields on campus. The application uses GPS locations to take their user on a walking tour of a given location. As a person walks along the path, they get a experience similar to one with a tour guide. The later version of this app will allow users to create their own tours.

Project Gettysburg-León

<u>Student(s):</u>	<u>Mentor(s):</u>	<u>Time/Location:</u>
Joseph Robinson, Thomas Grueter	Ivaylo Ilinkin	4:00pm - 5:30pm College Union Ballroom

Project Gettysburg-León is a sister city partnership between Gettysburg, PA and León, Nicaragua, supporting development projects in León, Nicaragua, promotes friendship, education and culture exchange between the two cities. We designed a web-based database interface to simplify and improve their collection and storage of member, donation, and event information.

Yoga Nidra Instruction Editor & Lesson Training Site

<u>Student(s):</u>	<u>Mentor(s):</u>	<u>Time/Location:</u>
Kuan Wang, Luke Burtch, Phoebe Eng, Timothy Cook	Ivaylo Ilinkin	4:00pm - 5:30pm College Union Ballroom

Yoga Nidra is an emerging type of yoga technique that utilizes the state of conscious deep sleep for extreme relaxation and subtle spiritual exploration. We collaborated with Amrit Yoga Institute and designed a website that allows Yoga Nidra instructors to more easily craft and store their lessons. Specifically, we built 1) an online instruction editor for Yoga Nidra teachers to customize and manage their instruction scripts, and 2) a personal training site for the general public to personalize and download Yoga Nidra lessons.

Economics

An Experimental Study of Citizens United Effects on Campaign Finance and Election Markets

<u>Student(s):</u>	<u>Mentor(s):</u>	<u>Time/Location:</u>
Shannon Brobst	John Cadigan Rimvydas Baltaduonis	4:00pm - 5:30pm College Union Ballroom

This paper uses research gathered from a political economy public choice laboratory experiment in which I programmed and collected data. An experimental laboratory setting allows control variables to create an environment similar to the campaign finance and election market system, where two treatments can be tested. The Pre Treatment represents the campaign finance system before the United States Supreme Court Case Citizens United v. Federal Election Committee and the Post Treatment represents the system after the case. The overarching question this experiment seeks to answer is how does the Citizens United precedent change competition in the campaign finance market? The more pivotal a voter believes they are the more likely they are to contribute to a campaign fund. The treatments affect participant 's perception of how pivotal they believe their contribution is to the election. The Two Sample Mean Comparison Test conducted on contribution rates of partisan voters shows that the Citizens United Case decreased the amount of donations by partisan voters and therefore decreased competition in the campaign finance market. Econometric Fixed Effect and Probit models are used to explain what drives activation rates. It is important that government legislatures understand the implications of their laws on the campaign finance system.

Explaining the Rapid Proliferation of Eco-labels

<u>Student(s):</u>	<u>Mentor(s):</u>	<u>Time/Location:</u>
Peter Standbridge	Linus Nyiwul	4:00pm - 5:30pm College Union Ballroom

In this project, I examine the empirical evidence for the reasons commonly identified in literature as the main drivers of the growth of eco-labels. Among the reasons suggested for this rapid growth of eco-labels is the rise in consumer and business demands, alongside the increasing expectations for the environmental quality of products across many sectors. This has encouraged producers and sellers of such products to meet the standards and expectations that many consumers have come to require. No empirical evidence exists to support the reasons for this proliferation. This study is intended to achieve this goal. The primary objective of this study is to demonstrate that if, in fact, the rapid growth of eco-labels is the result of increasing demand for environmentally and socially sustainable products, and producers and manufacturers are responding to this demand, then we would expect the growth of these labels in each sector to be closely correlated with the market share of that sector. Preliminary results employing a Negative Binomial model suggest a positive relationship between the market share of a sector and the number of eco-labels in that sector.

Education

Design and Implementation of Online Computer Science Course

<u>Student(s):</u>	<u>Mentor(s):</u>	<u>Time/Location:</u>
Erin Brady	Divonna Stebick	4:00pm - 5:30pm College Union Ballroom

Noticing that many local schools do not contain computer science courses as an option for their students, I decided to create my own curriculum. During my time at Gettysburg and particularly my time in the education department I have been exposed to a variety of teaching styles, methods and techniques. One concept that has become increasingly popular in mathematics classrooms over the last four years is the flipped classroom approach. In this approach, students learn content at home through videos. Then rather than practicing problems at home with their parents, students practice problems in school with their teachers, who have been specially trained to understand the concepts, helping them to complete assignments, and comprehend new information. Using knowledge that I have gained through both my computer science and my education courses, along with experience gained through being a TA, I created a curriculum. I spent time looking through standards, developing a scope and sequence, and creating lessons. I created all my lessons on a blog which can be found at: <https://missebrady.wordpress.com>. Each lesson consisted of a written explanation, a video containing an example of the given concept, and an assignment to be completed by the students. I hope to make use of the lessons I have created in the future as a teacher.

Environmental Studies

A feasibility study of using unmanned aerial vehicles to survey avian abundance by using audio recording.

<u>Student(s):</u>	<u>Mentor(s):</u>	<u>Time/Location:</u>
Janine Barr	Andrew Wilson	4:00pm - 5:30pm College Union Ballroom

Roadside counts are commonly used to assess songbird abundance, but they result in oversampling habitat edges and underrepresenting core habitats, areas of steep terrain, and wetlands. Accessing off-road habitats can be logistical challenging and time-consuming, resulting in low survey efficiency. Aerial ecological surveys, using unmanned aerial vehicles (UAVs, or drones) have already proven to be valuable in wildlife monitoring. Previous studies used photography or videography to provide permanent documentation of wildlife surveys through low altitude aerial imagery. A significant advantage of UAVs over manned aircraft is their greater safety and lower costs. We propose that UAVs can also be used to conduct audio surveys of vocal species. Here, we report on experiments to test the feasibility of using UAVs to conduct point counts of songbirds.

To establish the detection radius of bird songs recorded with a microphone attached to a UAV (DJI Phantom 2.0), recordings of the songs of five regionally abundant bird species (Wood Thrush, Eastern Towhee, Song Sparrow, Chipping Sparrow, and Eastern Meadowlark) were broadcast at distances of up to 140m from the UAV, which was flown at three altitudes (20m, 40m, and 60m). We found that detection rates and radial detection distances of the broadcasts did not differ with UAV altitude. Bird recordings were clearly audible at radial distances of 60m. We conclude that it is feasible to use UAVs to conduct aerial point counts that are comparable with traditional terrestrial bird point counts, and describe additional field experimentation needed to refine our survey protocols.

Is it hot out here?

Communicating global climate change using Glacier National Park, online media, and place attachment

<u>Student(s):</u>	<u>Mentor(s):</u>	<u>Time/Location:</u>
Dori Gorczyca	Salma Monani Sarah Principato	4:00pm - 5:30pm College Union Ballroom

According to the 2014 Fifth Assessment Report by the Intergovernmental Panel on Climate Change (IPCC), anthropogenic climate change is a reality. The atmosphere and oceans are warming, sea levels are rising, and greenhouse gas concentrations have increased (IPCC 2014). Despite this scientific consensus, roughly 35% of Americans are unconvinced that there is solid evidence for climate change (PewResearch 2014). One prominent strategy to effectively communicate climate change to the public is place attachment. According to Schweizer et al.'s paper (2013), place attachment is the concept that people are emotionally connected to specific landscapes, which can make them more willing to adopt conservation behaviors. The purpose of this study is to collect and utilize both scientific data regarding the ablating glaciers of Glacier National Park due to anthropogenic climate change and place attachment theory for online climate change communication. Specifically, I used these methods to develop a digital, interactive Wordpress website entitled "Is It Hot Out Here?" The site is designed to spread knowledge about climate change effects at Glacier National Park to a wider audience who may not be able to visit the park itself. Results show that the elevation of a glacier at the park was related significantly to the glacial area loss. To assess the usefulness of this online tool and the way in which online visitors engaged with the information, a survey among Gettysburg College students was distributed. The survey results are forthcoming.

Relationships between forest bird declines and hemlock woolly adelgid prevalence in the eastern United States.

<u>Student(s):</u>	<u>Mentor(s):</u>	<u>Time/Location:</u>
Julie Blum	Andrew Wilson	4:00pm - 5:30pm College Union Ballroom

The eastern hemlock (*Tsuga canadensis*) is a vital foundation tree species throughout the eastern United States, providing essential structural diversity and habitat for more than 120 different animal species. Within the past few decades, *T. canadensis* has undergone significant declines that are largely associated with the hemlock woolly adelgid (HWA; *Adelges tsugae*), an exotic, aphid-like insect native to East Asia. Since the early 1970s, the HWA has spread throughout southern New England, large portions of the Mid-Atlantic region, and in southern Appalachia. Research has shown that loss of the eastern hemlock is drastically altering forest community structures, potentially impacting a wide variety of forest fauna, including avian populations strongly associated with hemlock forests. Here we present research investigating the correlation between HWA infestation and recent declines of hemlock-associated forest birds in the Eastern US. We analyzed bird population trend data for 746 North American Breeding Bird Survey (BBS) routes for the period 1966-2013, and related trends to forest cover, hemlock prevalence, and the temporal spread of HWA. We found a significant correlation between the timing of HWA arrival and declines of conifer obligate songbirds; for example, the Black-throated Green Warbler (*Setophaga virens*) and the Blue-headed Vireo (*Vireo solitarius*) showed steep declines on BBS routes, commencing around four years after initial HWA infestation. Populations of forest generalist birds (e.g. Red-Eyed Vireo, Tufted Titmouse, White-Breasted Nuthatch, and Ovenbird) showed linear population trends throughout the period, with no change in population trajectory following HWA infestation.

German Studies

A joke, threat or sign?: An Analysis of The Patriotic Europeans Against the Islamisation of the West (Pegida) and both its Usage of Media and its Portrayal in Media

<u>Student(s):</u>	<u>Mentor(s):</u>	<u>Time/Location:</u>
Martina Khalek	Henning Wrage	4:00pm - 5:30pm College Union Ballroom

The Patriotic Europeans Against the Islamisation of the West (Pegida) is a group that began in the fall of 2014 in Dresden, Germany. Pegida has oppressive and exclusive values against Muslims. The popularity that this group has gained, in spite of its harsh portrayal via mainstream-media, depicts the need for attention to immigration issues and assimilation concerns.

Queer Temporalities and Spaces in Klaus Mann's *Der fromme Tanz* and Christopher Isherwood's *Goodbye to Berlin*

<u>Student(s):</u>	<u>Mentor(s):</u>	<u>Time/Location:</u>
Ann Sasala	Kerry Wallach	4:00pm - 5:30pm College Union Ballroom

This interdisciplinary work mixes queer and gender theory with history and literary analysis to answer the questions how do space and place intersect in the early novels of Klaus Mann –*Der from Tanz* (1926)—and Christopher Isherwood –*Goodbye to Berlin* (1932); what role did the historical cabaret the Eldorado play in each novel; and how does each author imbue their work with an authentic sense of queer life during the Weimar Republic (1918-1933)? Drawing upon the theoretical works of Judith Butler and J. Jack Halberstam, I first theorize the construction and importance of the cabaret within the context of Queer Weimar Berlin; I conclude my paper with close readings of the text. Through these readings my paper develops the ideas of normative –the cabaret—and non-normative –the literary space—spaces, discusses important dichotomies involving the spaces –interior/exterior and voyeur/participant—, and reads the doorways of each club as more than just a passage into a new space. In my paper, the doorways become a physical, metaphorical, and literary manifestation of the struggle between the queer Weimar community and the more hostile exterior world.

Global Leadership Gettysburg College

Bring Argentina to Gettysburg

Student(s):

Abigail Conner

Mentor(s):

Daniel Albertson

Time/Location:

4:00pm - 5:30pm
College Union Ballroom

This poster will look at how my time in Buenos Aires, Argentina affected and helped benefit my time back at Gettysburg.

GLGC Poster Presentation: Melbourne, Australia

Student(s):

Nikolas Jameson

Mentor(s):

Daniel Albertson

Time/Location:

4:00pm - 5:30pm
College Union Ballroom

My poster presentation will be focused on my time with the Global Leaders of Gettysburg College. It will focus on what I have gained from being an active member of the program and how it has helped me connect my study abroad experience in Melbourne, Australia to my academic career and campus life back at Gettysburg College.

Global Leaders of Gettysburg College

Student(s):

Teresa Crist

Mentor(s):

Daniel Albertson

Time/Location:

4:00pm - 5:30pm
College Union Ballroom

This past year I had the pleasure to be accepted into the Global Leaders of Gettysburg College. This program is not a focus upon your personal time studying abroad. The GLGC focuses upon taking these experiences from studying abroad and stepping further to use them on campus. My time with them this year helped me share my global experiences with those of Gettysburg College.

Liz Foster GLGC Experience

Student(s):

Elizabeth Foster

Mentor(s):

Daniel Albertson

Time/Location:

4:00pm - 5:30pm

College Union Ballroom

The GLGC is a three pillar program of Mentorship, Scholarship, and Activism that takes the fundamentals gleaned from my time abroad and applies these experiences one step further for the betterment of the broader campus community. This poster focuses on my time in the GLGC over three semesters and includes what I have gained from the program in three different areas. The first area was mentorship, whereby I helped others by working with other students to help prepare those students to study abroad in Buenos Aires, Argentina, which is where I studied abroad. The second area was connecting my experience to the campus community by learning about how our actions have an effect on the world around us through environmental, cultural, and economic influence. Lastly, the third area was expanding my knowledge of different cultures through conversations with other members of the GLGC, which heightened my passion for travel and led me to sign up for the Gettysburg Center for Public Service sustainable agriculture immersion trip to Nicaragua.

Making Sense of Florence: My Time in the GLGC

Student(s):

Megan Fowle

Mentor(s):

Daniel Albertson

Time/Location:

4:00pm - 5:30pm

College Union Ballroom

This poster will detail my abroad experience and my experience in the Global Leaders of Gettysburg College. Coming back from abroad can be a very trying time, a time where students have to make sense of their experiences abroad and how those global experiences and understandings can continue to shape them on Gettysburg College campus and in the outside world. The GLGC really helped me to apply my time abroad to my academics here at Gettysburg. Additionally, the GLGC helped me share my experiences with others who are choosing to go abroad through their mentorship program.

My Experience with the GLGC

Student(s):

Alice Mitnick

Mentor(s):

Daniel Albertson

Time/Location:

4:00pm - 5:30pm

College Union Ballroom

This is a culmination of my experience with GLGC and will showcase how I have connected my global experience with the campus community.

Globalization Studies

Abstracts
Globalization Studies/
Health Sciences

“Literature Review of Child Food Insecurity for Local Research Projects”

<u>Student(s):</u>	<u>Mentor(s):</u>	<u>Time/Location:</u>
Erin Brennan	Amy Dailey	4:00pm - 5:30pm College Union Ballroom

Located in South Eastern Pennsylvania, Adam ' s County has a population of 101,546 citizens (United States Census Bureau, 2014). In the town of Gettysburg, 23.9% of the population are below the poverty level compared to 16.4% statewide (Advameg, 2009). Research has been conducted to observe the effects that poverty has had on childhood health. Low income youth are less likely to have frequent fruit and vegetable intake (Di Noia, 2014). Although parents wish to be able to offer their children healthier food options, they are unable to afford healthy food all the time (Yousefian, 2011). A systematic review of the scientific literature on socioeconomic, rural and racial/ethnic disparities in food access was conducted by Erin Brennan and Dr. Amy Dailey. These findings were compiled for a National Institute on Minority Health and Health Disparities Grant (principal investigator, Dr. Amy Dailey). Additionally, this research was applied to manuscript writing for local projects.

Health Sciences

In Vitro Incubations of mouse skeletal muscle with AICAR

<u>Student(s):</u>	<u>Mentor(s):</u>	<u>Time/Location:</u>
Daniel Moorhead	Josef Brandauer	4:00pm - 5:30pm College Union Ballroom

Physiological investigation of mammalian tissues is often complicated by the interplay of various systems within an organism. This is particularly true in skeletal muscle, which not only is affected by hormones such as insulin, but also acts as an endocrine organ itself. ‘ In vitro ’ incubations of whole skeletal muscles can be used to eliminate these confounding variables, but incubators for skeletal muscles are either cost prohibitive or difficult to acquire. Using readily available dry bath incubators and a 3D printer, we were able to successfully build and test an incubator.

In a proof of concept experiment, we incubated mouse skeletal muscles with 5-Aminoimidazole-4-carboxamide ribonucleotide (AICAR), a pharmacological activator of AMP-activated protein kinase (AMPK). AMPK is an intracellular fuel gauge that is readily phosphorylated following AICAR exposure. In our experiments, we observed significantly increased levels of phosphorylated AMPK following incubation with AICAR, thus validating our experimental series.

**Tissue-specific abundance of NAMPT, CLOCK, and BMAL1 proteins in murine tissues;
Effects of glucose intolerance on BMAL1 and SIRT3 expression**

Student(s):

Alex Lupolt

Mentor(s):

Josef Brandauer

Time/Location:

4:00pm - 5:30pm

College Union Ballroom

Circadian Locomotor Output Cycles Kaput (CLOCK) and Brain and Muscle Arnt-like protein-1 (BMAL1) are transcription factors that regulate protein expression oscillations in peripheral tissues. CLOCK and BMAL1 form a complex that initiates the transcription of circadian-regulated genes like nicotinamide phosphoribosyl transferase; NAMPT), the rate-limiting enzyme in NAD biosynthesis. The abundance of clock proteins likely varies in a tissue-specific manner. We investigated protein abundance of CLOCK, BMAL1, and NAMPT in mammalian tissues. Mitochondrial function and clock machinery are likely involved in the etiology of metabolic disease. We studied a glucose intolerant phenotype to determine its effect on SIRT3, a histone deacetylase that modulates mitochondrial functions, and BMAL1 abundance in liver and skeletal muscle.

Various skeletal muscles (quadriceps (Q), gastrocnemius (G), extensor digitorum longus (EDL), soleus (S)), heart (H), liver (L), brown adipose tissue (BAT), visceral adipose tissue (VAT), and subcutaneous adipose tissue (SAT) were removed and immunoblots for NAMPT, BMAL1, and CLOCK were performed.

Relative CLOCK protein abundance was high in liver tissue, while BMAL1 expression was most highly expressed in mouse SAT, VAT, and heart. We detected significant elevations in NAMPT protein concentrations in mitochondria-dense tissues, which suggests that circadian variations are especially pronounced in these tissues. Relative CLOCK and BMAL 1 protein abundances are not clearly correlated within tissues, even though their dimerization initiates transcription of genes. These data could indicate that these proteins have additional functions within the cell that do not require their interaction.

History

Constructing a History for Poverty: Museum Interpretations of Poverty & Welfare in the United States and England

Student(s):

Rebecca Duffy

Mentor(s):

Jill Oglie Titus

Time/Location:

4:00pm - 5:30pm

College Union Ballroom

This project investigates how the Lower East Side Tenement Museum in New York City and The Workhouse in Southwell, England explore and interpret the controversial history of social class, poverty and welfare between 1870 and 1930 for school groups and school aged children. The project provides important insight into the ways in which modern political and cultural contexts as well as changing school curriculum shape these interpretations and discussions in two countries with similar cultures and some shared history. It not only explores the history of poverty and the beginning of welfare systems, but more importantly, the way museums, public historians and curators construct interactive programs and exhibitions to engage modern visitors with this particular past while molding it into something usable by encouraging empathy and consideration of connections between historical issues and contemporary realities.

Interdisciplinary Studies

Powers of Place: The Influence of Teacher Experiential Education on Student Learning Experiences

<u>Student(s):</u>	<u>Mentor(s):</u>	<u>Time/Location:</u>
Katherine Burke	David Powell	4:00pm - 5:30pm College Union Ballroom

Experiential education has been a field of study for almost a century, largely based on the theories of John Dewey, Kurt Lewin, and Jean Piaget. Powers of Place examines the experience of participants in On Hallowed Ground: Gettysburg in History and Memory, an NEH Landmarks program, through the lens of existing experiential education theory and seeks to find practical applications for the relationship between a teacher's experiential learning in a physical location and the altered learning experience of students that results in his or her classroom.

The Need to Belong: School Counselors Impact School Climate and Students' Success

<u>Student(s):</u>	<u>Mentor(s):</u>	<u>Time/Location:</u>
Erin O'Connor	David Powell	4:00pm - 5:30pm College Union Ballroom

School belonging is the perception of students that they are accepted, respected, and liked within school settings. When students feel more connected to school and believe that adults in the school care about their learning and about themselves as individuals, students are more likely to succeed. School counselors play a critical role in helping students feel a sense of belonging in school, so I set out this semester to design a research project that would help me understand how feelings of school belonging and academic achievement differ for bilingual students transitioning from the dual-immersion school. Unfortunately, I found that measuring school belonging is very difficult in today's schools, where standardized testing and limited resources pull students and school counselors in multiple directions. In this presentation, I'll discuss my experiences in the school this semester, as well as the idea behind school belonging and the important role research on school belonging can play in making schools more welcoming places for all students.

Mathematics

For When Life Isn't Fair: Methods in Fair Division

Student(s):

Alice Mitnick

Mentor(s):

Beth Campbell Hetrick

Time/Location:

4:00pm - 5:30pm

College Union Ballroom

Fair division has many applications in the real world: from divorces and inheritance, to dividing up a cake or a stash of Halloween candy. This topic has inspired many methods dating back to the 1940's. In our research, we explore these methods, specifically looking at divisions of goods that are finite, continuous, and divisible such as division of a cake. We define a method as fair if it creates partitions that are Proportional, Envy-Free, and Pareto-Optimal. Using this definition, we aim to determine what method is the best depending on the amount of participants. Come listen to find out which method is the fairest of them all.

p-Adic Analysis and the Maximum Modulus Principle

Student(s):

Tyler Reckner

Mentor(s):

Keir Lockridge

Time/Location:

4:00pm - 5:30pm

College Union Ballroom

First introduced by Kurt Hensel in 1897, the p-adic number system was originally formalized as a means of extending power series into the field of number theory. Nowadays, however, the p-adics have far-reaching applications throughout mathematics, including in algebra, analysis, and classical number theory. In this talk, we will introduce the p-adic number system and explore the field of p-adic analysis. We will also compare p-adic analysis to classical analysis by offering a p-adic result analogous to the Maximum Modulus Principle - a fundamental result in classical complex analysis

The Use of Smith Normal Form Matrices to Solve Chip Firing Games

Student(s):

Erin Brady

Mentor(s):

Darren Glass

Time/Location:

4:00pm - 5:30pm

College Union Ballroom

A normal matrix associated to any non-zero $m \times n$ matrix A , and showed that we can write N as the product of matrices $N = PAQ$. N is the normal $m \times n$ matrix, P is the $m \times m$ matrix obtained by keeping track of your row operations, and Q is the $n \times n$ matrix found by keeping track of your column operations. The Smith normal form is a normal form that can be defined for any matrix (not necessarily square) with entries in a principal ideal domain (PID). A principal ideal domain is an integral domain in which every proper ideal can be generated by a single element. The Smith normal form of a matrix is diagonal, and can be obtained from the original matrix by multiplying on the left and right by invertible square matrices. In particular, the integers are a PID, so one can always calculate the Smith normal form of an integral matrix. Chip firing games are mathematical games in which a set of points, called nodes, each has some number of chips. Firing a node sends one chip to all nodes which share an edge with the firing node. Through the course of my capstone I made use of the Euclidean Algorithm in order to find the greatest common divisor (GCD) of elements in a given row, or column, of a matrix. Using the GCD it was possible to discover which integral combinations of the columns of the matrix are possible to achieve. Working with the integral combinations it was possible to discover all possible states of a chip firing game based on the configuration of the nodes, edges, and the initial state. The nodes and edges provided me with the columns of the matrix. My work with integral combinations of vectors provided the basis for finding all possible states. I was able to make use of my knowledge of Java to help with the computations that were needed.

Physics

An Unbinned Correlation Method for Tracking Polar Mesospheric Clouds

Student(s):

Franz Utermohlen

Mentor(s):

Peter Pella

Time/Location:

4:00pm - 5:30pm

College Union Ballroom

We developed a correlation method that allows us to correlate images that have geolocated pixels without having to bin the pixels and therefore lose resolution. In addition to allowing us to preserving resolution, this correlation method also allows us to correlate images having different resolutions and spatial orientations, thus making it quite flexible. We developed this correlation method in order to use cross-correlations to track polar mesospheric clouds (PMCs) using the data from the Cloud Imaging and Particle Size (CIPS) instrument on the Aeronomy of Ice in the Mesosphere (AIM) satellite.

Detector calibrations for fragmentation reactions with relativistic heavy ions at the NSCL

<u>Student(s):</u>	<u>Mentor(s):</u>	<u>Time/Location:</u>
Heather Garland	Sharon Stephenson	4:00pm - 5:30pm College Union Ballroom

Prefragmentation dynamics, when neutron-rich beam nuclei interact with reaction target nuclei, has not been the subject of much experimental study. Recent data taken at the National Superconducting Cyclotron Laboratory (NSCL) in an experiment to further understand prefragmentation processes is currently being analyzed. To experimentally determine the momentum distributions of the charged fragments made after the prefragmentation interaction between a ^{32}Mg beam and a ^9Be reaction target requires knowledge of the charged fragments' velocity vectors. Four detectors give us position information, and two others give us energy. I worked on calibrating the four position detectors for this experiment.

Simulated Stratospheric Aerosol Effects on Earth's Solar Radiation Budget

<u>Student(s):</u>	<u>Mentor(s):</u>	<u>Time/Location:</u>
Ryan McCabe	Jacquelynne Milingo	4:00pm - 5:30pm College Union Ballroom

This research investigated how the perturbation of the stratospheric aerosol bi-modal size distribution (e.g. the individual coarse and fine modes of aerosol concentration, radius, and standard deviation of particle size) affects the total phase function of the atmosphere at an altitude of 25 km and its associated top of atmosphere flux with a solar zenith angle of 0 degrees. Data were generated with a Radiative Transfer Model provided courtesy of Dr. Robert Loughman. In the model, the size distribution's properties are perturbed in +5% intervals up to +25% perturbation. It was found that coarse mode width contributed the greatest change to the phase function while the fine mode radius contributed the greatest positive change to top of atmosphere flux. Also included was learning and utilization of FORTRAN 90 (model/analysis), Octave (plotting/analysis), LaTeX, and Linux.

Psychology

Age differences in the value of modesty: Implications for cross-generational studies of narcissism

Student(s):

Rachel Clasing

Mentor(s):

Kathy Berenson

Time/Location:

4:00pm - 5:30pm

College Union Ballroom

Generational increases in narcissism have received much attention in the personality literature and popular press in recent years. Though evidence does suggest an increase in scores on the Narcissistic Personality Inventory in the past three decades, opinions differ on how to interpret such an increase. One possibility that has not been addressed in previous research concerns the influence of changes in attitudes about narcissistic characteristics. In a series of two internet-based studies, we found that relative to older people, younger people interpret boastful statements more positively, and humble statements more negatively, even when their own level of narcissism is statistically controlled. Such evidence for cultural shifts in the desirability of the answer choices on the NPI raises questions about the validity of its use for cross-generational comparisons.

Aggression in gender role-play

Student(s):

Danielle Hernandez, Kurt Mathisen

Mentor(s):

Kathleen Cain

Time/Location:

4:00pm - 5:30pm

College Union Ballroom

There has been a long line of research studying gender as it relates to aggression (Hanish, Sallquist, DiDonato, Fabes & Martin 2012; Jones & Glenn 1991; Lever 1976). It remains unclear whether aggression differences are implicit in a person's gender, or if they stem from how a person is socialized at an early age as a result of their gender. Given children's inclinations for pretend play (Jones & Glenn 1991; Lever 1976), the present study seeks to examine how socialization of gender effects aggression. A sample of preschool children aged 36 to 60 months from two classrooms in a semi-rural town role-played in either same-gender or other-gender play and then responded to a subsequent story that raises a potential conflict for the child to react to constructively or destructively. We hypothesize that when primed with play-acting as a male character, both male and female children will exhibit more aggression than if they were play-acting as a female character.

Keywords: early childhood, gender roles, pretend play, aggression, social expectations

An embodied metaphor's effect on deliberate thought processes and perseverance.

Student(s):

Colleen Boyle, Lindsay Westberg, Theresa Houtz

Mentor(s):

Rebecca Fincher-Kiefer

Time/Location:

4:00pm - 5:30pm
College Union Ballroom

Metaphors are used frequently, in many languages, to represent abstract concepts. Previous research has shown that acting out a metaphor, for example one that applies to creativity, such as thinking “outside of the box”, affects behavior in a way consistent with the metaphor’s meaning (Leung, Kim, Polman, Ong, Qiu, Goncalo, & Sanchez-Burks, 2011). The purpose of the current study was to explore a popular metaphor that indicates thinking very carefully, or to “chew something over”. The participants were either in a metaphor group, where they chewed a piece of gum, or a control group, where they sucked on a hard candy, and were asked to complete both a perseverance task and an attention task. We hypothesized that participants acting out the metaphor “chewing something over” would perform better than the control group on the perseverance task, but the two groups would perform similarly on an attention task. The results did not support these hypotheses, showing no significant difference between groups. Experiment 2 seeks to further explore this unexpected outcome using the more interactive metaphor “dig deeper”.

Are mindful eaters influenced by bowl size in the consumption of chocolate?

Student(s):

Kyra McFadden, Rebecca Utzinger

Mentor(s):

Daniel McCall

Time/Location:

4:00pm - 5:30pm
College Union Ballroom

There are countless factors that increase food intake and consumption. For example, previous research has shown that individuals are likely to consume more food when eating from a large bowl compared to a smaller bowl (Wansink, 2010). Additionally, studies have shown that mindless eating causes individuals to ignore internal cues of satiety and therefore consume more (Wansink, 2004). The current study will examine whether the bowl size effect can be reduced if participants are mindful while eating. Participants were randomly assigned to a mindful condition or control condition. In the mindful condition, participants completed a task to induce mindfulness. After completing the task, participants in both conditions were given bowls of chocolate chips and were asked to complete an evaluation of the chocolate. Half of the participants in each group received the chocolate in a small bowl, while the other half had a large bowl. We predicted that participants in the mindful condition would consume less chocolate than those in the control condition. We also predicted that there would be a difference between bowl size, with participants consuming less chocolate when presented in a small bowl compared to when presented in a large bowl. Finally, we hypothesized an interaction in that the effect of the bowl size would be smaller for participants in the mindful condition than those in the control condition.

Behavioral Effects of FG7142 on Isolation Rearing in Wistar and Sprague-Dawley Rats

<u>Student(s):</u>	<u>Mentor(s):</u>	<u>Time/Location:</u>
Monica Doring	Stephen Siviyy	4:00pm - 5:30pm College Union Ballroom

In the current study, we examined the effects of early social deprivation on the sensitivity of GABA A receptors in Wistar and Sprague-Dawley rats in both the Open Field Test (OFT) and the Elevated Plus Maze (EPM). We examined the behavioral effects associated with the benzodiazepine inverse agonist N-methyl- β -carboline-3-carboxamide (FG7142). Results. OFT The effects of isolation were comparable between the 2 strains although Wistar rats were more active than SD rats overall and spent more time in the center. After treatment with FG7142, rats housed in isolation continued to be more active and reared more than those housed socially although this was only apparent in Wistar rats. This suggests that rats housed in isolation for 2 weeks may be particularly sensitive to the effects of FG7142. EPM Rats who were treated with FG7142 spent less time in the open arms than those treated with a vehicle. Wistar rats spent more time in the open arms than the Sprague-Dawley rats. This suggests that rats treated with FG7142 are more anxious and Wistar rats seem to be less anxious. Similarly, rats treated with FG7142 were less active than the vehicle and Wistar rats were more active than Sprague-Dawley rats. Conclusions. The results show tentative support for the hypothesis. The open field test data support the idea that GABAA receptors are stress-sensitive; however, the results of the elevated plus maze are not as clear. The results of both tests show that there are strain differences and drug effects, but the role of chronic stress on these effects is not clear.

Chronic and acute cocaine administration: Cocaine and anxiety in adolescent female Wistar rats

<u>Student(s):</u>	<u>Mentor(s):</u>	<u>Time/Location:</u>
Alicia Castro, Danielle Hernandez, Samantha Eck	Stephen Siviyy	4:00pm - 5:30pm College Union Ballroom

Adolescents seem to be particularly susceptible to the behavior-altering properties of cocaine. Past research has shown that cocaine has an anxiolytic effect in acute doses, but an anxiogenic effect in chronic doses. Chronic drug administration has also been linked to long-term changes in anxiety-like behavior. In this study, we investigated the effects of chronic and acute cocaine administration on anxiety in adolescent female Wistar rats. Anxiety levels were tested in the elevated-plus maze (EPM) after both chronic and acute drug administration and 10 days after cessation of chronic drug treatment. Regardless of chronic drug administration, rats that received acute doses of cocaine spent more time in the open arms of the EPM, indicating lower anxiety levels. Acute cocaine administration was also associated with increased locomotion. Rats that had received chronic cocaine administration spent less time in the open arms after cessation of chronic drug treatment, independent of acute drug administration. This suggests that that there are long-term anxiogenic effects of cocaine.

Critical approaches to General Psychology: Implications for social justice

<u>Student(s):</u>	<u>Mentor(s):</u>	<u>Time/Location:</u>
Amy Violante, Gwen Houck	Sahana Mukherjee	4:00pm - 5:30pm College Union Ballroom

Many college courses have a central theme of diversity and specifically aim to increase students' awareness of privileges and disadvantages. Previous research indicated that diversity courses (e.g., courses on stereotyping and prejudice in psychology, courses on women, gender, and sexuality) can be effective in increasing awareness of White privilege and decreasing racial prejudice among college students (Case, 2007). The present study examines whether a course can have a similar effect on students' attitudes towards privilege and disadvantage, even if it is not specifically focused on diversity. Students were asked to complete a survey at the beginning and end of an introductory psychology course. Their responses were examined to see whether or not the introductory psychology course increased students' critical consciousness and impacted their attitudes towards social justice issues (e.g., perception of privilege and disadvantage, civic and global engagement). Discussion focuses on use of critical pedagogical approaches to promote goals associated with social justice outcomes.

Discrimination Type and Flag Presence on Perceptions of Discrimination toward the LGBTQ Community and Support of Pro-LGBTQ Legislation

<u>Student(s):</u>	<u>Mentor(s):</u>	<u>Time/Location:</u>
Samantha Lee, Sarah Boulton	Sahana Mukherjee	4:00pm - 5:30pm College Union Ballroom

Research suggests that exposure to stereotypes via primes can activate cognitive schemas and produce attitude and behavior changes that align with relevant stereotype information (Chen & Bargh, 1997; Kawakami, Dovidio, & Dijksterhuis, 2003; Kawakami et al., 2011). In the present study, we examine how exposure to (i) the American flag representative of Republican ideals (Carter, Ferguson, & Hassin, 2011) and (ii) type of discrimination influences perception of discrimination concerning the LGBTQ community and support for pro-LGBTQ legislation. Based on prior literature regarding flag priming and dominant group denial of unjust acts (Nelson, Adams, & Salter, 2012), we predict that participants exposed to the individual discrimination condition versus systemic discrimination condition will perceive fewer acts of injustice, especially in the presence versus absence of the American flag. Based on our recent research, we also predict that the more people perceive injustice, the more likely they are to support pro-LGBTQ legislation.

Participants received a link to an online survey, where they were randomly assigned to view or not view the American flag and to read a story reflecting individual or systemic discrimination. Next, they completed measures on perceptions of discrimination in various situations concerning the LGBTQ community and their level of support for pro-LGBTQ legislation. They then completed a demographics questionnaire, were thanked, and debriefed.

Our discussion focuses on the implications of these results on educating Americans about the LGBTQ community. Particularly, we plan to discuss the extent to which systemic portrayals of discrimination can promote positive outcomes.

Effects of Caffeine on Anxiety in Adolescent Rats

<u>Student(s):</u>	<u>Mentor(s):</u>	<u>Time/Location:</u>
Benjamin Rodgers, Kurt Mathisen, Michelle Fox	Stephen Siviyy	4:00pm - 5:30pm College Union Ballroom

Caffeine is a drug that can have both positive and negative implications to the physiological and psychological systems of a body. Past research conducted examined the effects of caffeine administration and the anxiogenic effects that it induces on rats. In the current study, researchers were interested in viewing the anxiogenic effects of caffeine when administered to rats at a chronic and acute rate and presented with an elevated plus maze (EPM) for assessment of anxiety. There was no significance found for anxiety effects between chronic and acute administrations of caffeine but there was significance between groups for distance traveled

Effects of Country of Origin and English Language Fluency on Perceptions of Immigrants

<u>Student(s):</u>	<u>Mentor(s):</u>	<u>Time/Location:</u>
Alicia Castro, Claire Alexander, Samantha Eck	Sahana Mukherjee	4:00pm - 5:30pm College Union Ballroom

We aimed to illuminate some of the ways in which immigrant groups are perceived differently in the United States. Specifically, we investigated how culturally embedded stereotypes of immigrants from different countries of origin (i.e. Mexico or Germany) and conceptions of English and foreign language fluency affected the perceived competence and warmth, the predicted school placement, and the predicted future success of those immigrants.

Embodied Cognition and Racial Stereotyping: Preschoolers' Explicit Associations as a Function of Fluid versus Rigid Movement

<u>Student(s):</u>	<u>Mentor(s):</u>	<u>Time/Location:</u>
Isabella Schiro, Kelly Westerman	Kathleen Cain	4:00pm - 5:30pm College Union Ballroom

Prior studies have investigated the relationship between young children's explicit attitudes toward racial groups (Clark & Clark, 1939, 1947). However, there is a lack of research examining the manner in which racial attitudes can be counteracted on a psychological level in young children. The current study explores how embodied cognition, specifically fluidity and rigidity of movement, influences preschoolers' explicit racial attitudes. Thus, children, ages 3 to 5, participated, with parental consent, in a manipulation of movement, either fluid or rigid, prior to completing a racial preference measure. Analyses will address the impact of movement type and age on racial preferences. Findings will be discussed in terms of the contribution of understanding children's early formation of stereotyping and developing a means to create possible intervention and education programs to reduce such thought patterns.

Emotion Recognition in Children as a Function of Vocal Cues

Student(s):

Kellyann Walley, Lindsay Gonnella

Mentor(s):

Kathleen Cain

Time/Location:

4:00pm - 5:30pm

College Union Ballroom

The present study was designed to analyze children ' s ability to recognize emotions through presentation of brief vocal cues. Preschool children, ages 3-5, were asked to recognize four basic emotions based on three categories of vocal cues: semantic, numeric, or a sound effect. Analyses were conducted to determine children ' s ability to recognize emotions when exposed to recordings of brief vocalizations. It was hypothesized that since children start developing vocal recognition at the early age of 2 years old, correct emotion recognition would be found at a level that is greater than chance.

Excuses, Excuses: The Interaction between Excuse and Provocation Strengths on Subsequent Aggressive Behavior

Student(s):

Colin Mancini

Mentor(s):

Christopher Barlett

Time/Location:

4:00pm - 5:30pm

College Union Ballroom

We tested if the strength of an excuse has to match the strength of the provocation to reduce aggressive behavior. Participants were either given a weak or strong excuse and provocation before aggressing. Results showed differences between excuse quality for the strong, but not the weak provocation.

Glucose and Priming Effects on Internal State Hostility, Arousal and Aggression

Student(s):

Benjamin Rodgers, Grace Groover, Kira Mason

Mentor(s):

Christopher Barlett

Time/Location:

4:00pm - 5:30pm

College Union Ballroom

The present study investigated whether or not the "hangry" effect could be reversed, using increased glucose to moderate the effects of aggressive primes. If the theory of a three-part present internal state holds, as suggested by the research, then the physical change of increased glucose levels should have some effect on the influence of priming on cognitions, and in turn, present internal state. If a participant is primed to be more aggressive and subsequently administered an adequate glucose dose, then perhaps there will be a change in the aggression and " hangry " that is observed and measured. We hypothesized that participants who receive the aggressive prime and glucose should score lower on the aggression measures than participants who receive the aggressive prime with the placebo, and closer to the scores of the participants who received the neutral prime and no glucose.

Glucose and Priming Effects on Internal State Hostility, Arousal and Aggression

<u>Student(s):</u>	<u>Mentor(s):</u>	<u>Time/Location:</u>
Benjamin Rodgers, Grace Groover, Kira Mason	Christopher Barlett	4:00pm - 5:30pm College Union Ballroom

The present study investigated whether or not the "hangry" effect could be reversed, using increased glucose to moderate the effects of aggressive primes. If the theory of a three-part present internal state holds, as suggested by the research, then the physical change of increased glucose levels should have some effect on the influence of priming on cognitions, and in turn, present internal state. If a participant is primed to be more aggressive and subsequently administered an adequate glucose dose, then perhaps there will be a change in the aggression and "hangry" that is observed and measured. We hypothesized that participants who receive the aggressive prime and glucose should score lower on the aggression measures than participants who receive the aggressive prime with the placebo, and closer to the scores of the participants who received the neutral prime and no glucose.

Interpersonal Skills and Agreeableness: The Effects of Group Inclusion and Cohesion on Aggression

<u>Student(s):</u>	<u>Mentor(s):</u>	<u>Time/Location:</u>
Genevieve Herdegen, Grace Van Scoyk, Kayla McQuillan	Christopher Barlett	4:00pm - 5:30pm College Union Ballroom

The present study aimed to examine differences between women who belong to an inclusive group and women who do with regards to levels of relational aggression. In particular, this study aimed to identify factors that mediate relational aggression in women who belong to an inclusive group. We define an inclusive group as five or more members of an all-female, college-recognized organization that meets at least once a week. The proposed mediators between group members and relational aggression that were examined in this study were agreeableness, interpersonal skills, and group cohesion. It is hypothesized that agreeableness and interpersonal skills will inhibit relational aggression in both group and no-group conditions, with in-group participants ranking higher in both variables than no-group participants. In addition, we proposed that members of a cohesive group would be more relationally aggressive towards individuals outside of their group, but that they will be less relationally aggressive towards those inside their group. Participants were asked to give demographic data, which will also be used to determine which condition they will be separated into. The two conditions in the present study are "belonging to an inclusive group" or "not belonging to an inclusive group." Participants will then be primed by a writing task that will ask them to describe their group (or a less established group of people if they are in the no group condition). Then, the survey will ask participants questions relating to interpersonal skills, agreeableness, and the cohesion of their groups. Lastly, the survey will prompt participations to complete a relational aggression questionnaire. The "belonging" group will complete two questionnaires; one will assess their relational aggression towards members of their group, and one which will assess their relational aggression towards individuals outside their group. The "not belonging group" will fill this questionnaire out about their

Poster Title: Thinking Through a Situation: Need for Cognition as a Moderator between Provocation and Aggressive Behavior

<u>Student(s):</u>	<u>Mentor(s):</u>	<u>Time/Location:</u>
Dorian Jones, Hannah Oliphant	Christopher Barlett	4:00pm - 5:30pm College Union Ballroom

We tested if need for cognition (NFC) can increase or decrease aggression after a strong or weak provocation. Results showed that when the provocation was weak, NFC was negatively related to aggression. However, when the provocation was strong, NFC was positively related to aggression.

Predicting Cyberbullying Behavior

<u>Student(s):</u>	<u>Mentor(s):</u>	<u>Time/Location:</u>
Kristina Chamberlin	Christopher Barlett	4:00pm - 5:30pm College Union Ballroom

The current research evaluated a variety of factors (i.e., anonymity, strength differential, media usage, etc.) thought to longitudinally predict changes in cyberbullying behavior. College students completed three waves of the study over the course of an academic year to evaluate those changes. The purpose of this study was to build upon a theoretical basis for predicting cyberbullying behavior based on the General Learning Model (GLM). Data from Waves I and II have been collected, while Wave III is still in progress. Results from Waves I and II will be analyzed and available for discussion.

Race, Obesity, and Aggression

<u>Student(s):</u>	<u>Mentor(s):</u>	<u>Time/Location:</u>
Alexis Palladino, Kimberly Houston, Zachary Witkower	Christopher Barlett	4:00pm - 5:30pm College Union Ballroom

The present study analyzes how two overt indicators of status, weight and race, influence aggressive intent and aggressive behavior. Participants were exposed to four target stimuli that varied in race (Black or Caucasian) and weight (obese or skinny), and asked questions to gauge their aggressive responding. While there is research indicating that race and weight are individual indicators of status, and other research to link status to aggression, there is a paucity of research manipulating both of these variables simultaneously to measure aggressive responding. It was predicted that for thin targets, black targets will be aggressed towards significantly more than white targets and, additionally, obese targets that are black will be aggressed towards significantly more than obese targets that are white, but the magnitude of this effect will be greater. A speculative competing hypothesis is that an individual is less likely to aggress towards an overweight and/or black target due to conscientious reduction of aggressive responses occurring as a function of prejudice and status.

Shaping odors: Visual priming effects on olfaction

Student(s):

Jessica Johnson, Selah Kwak

Mentor(s):

Daniel McCall

Time/Location:

4:00pm - 5:30pm

College Union Ballroom

When humans perceive the world, we usually do so using more than one sensory modality. This multisensory experience creates cross-modal associations. Flavor perception, for example, integrates the senses of taste and olfaction with vision. Prior research has demonstrated that odors are associated with abstract visual shapes. Odors such as menthol and cinnamon that stimulate the trigeminal system are associated with “ sharp ” shapes, while non-trigeminal (olfactory) odors like vanilla and coconut are associated with “ round ” shapes. We report two experiments that examined whether exposure to shapes in a priming task influence odor perception. In experiment 1, we primed participants with either round or sharp shapes and asked them to evaluate trigeminal and olfactory odors. Results were inconclusive. In experiment 2, we altered the priming procedure in an attempt to strengthen the effects of the prime.

Stickerland: How does the possibility of concealment effect children's desire to cheat

Student(s):

Alexandra Kelly, Madeline Ruble, Mariah Sprague

Mentor(s):

Kathleen Cain

Time/Location:

4:00pm - 5:30pm

College Union Ballroom

The present study was designed to examine children ’ s cheating behaviors and regard for honesty and fairness, in a game play situation. Shaw et al. (2014) examined how throughout the course of development, children develop increasing concerns about fairness. Current research is interested in children ’ s concern with appearing fair versus actually being fair and the effects these factors may have on cheating behaviors. Current research will also explore whether or not there are any gender differences in cheating or concerns for fairness, where boys are predicted to cheat more often than girls. Observations of preschoolers will be made during the course of playing an experimentally designed Candyland-type game (Stickerland), where manipulations will involve whether or not a child believes you can see if their responses in the game correspond with the true card they have drawn (concealed vs unconcealed). Discussion will focus on the implications of these findings for parents in the home and teachers in the classroom.

The Effect of Black and White versus Color Images on Neuroscientific Articles' Credibility

Student(s):

Kimberly Vivas, Ryan Gallagher

Mentor(s):

Kevin Wilson

Time/Location:

4:00pm - 5:30pm
College Union Ballroom

Previous research has shown that the use of brain images makes people consider neuroscientific articles more credible when compared to articles without an image or with a chart (McCabe et al., 2008). Other research has indicated that the use of color in images can affect the way people both process and attend to it, with people paying more attention to color images (Lee et al., 2014; Dooley & Harkins, 1970). Therefore, we hypothesized that neuroscientific articles accompanied by color brain images would be considered more credible as opposed to neuroscientific articles accompanied by black and white images.

The Effect of Embarrassment and Pride Stories on Children's use of their Least Preferred and Most Preferred Colors in a Subsequent Drawing Task

Student(s):

Kelly McGrath, Paige Ruland

Mentor(s):

Kathleen Cain

Time/Location:

4:00pm - 5:30pm
College Union Ballroom

Children ' s color preference in a coloring task will be measured as function of gender and story type, pride and embarrassment. Researchers hypothesize that children will use their most preferred colors, measured using the smiley-face Likert scale, to color in the outline of a person following the pride story and their least preferred colors to color in the outline of a person following the embarrassed story. Furthermore, researchers hypothesize that children will rate the individual in the pride condition as feeling more positive emotions and will rate the individual in the embarrassed condition as feeling more negative emotions. Lastly, researchers hypothesize that the children will be more confident in their color choices following the pride story than the embarrassed story. Children ages 3-5 will be tested in a separate testing room within their preschool. Children will be trained with a smiley-face Likert scale and will then be read 2 stories where an individual will be described as experiencing pride and where an individual will be described as experiencing embarrassment. Following the story children will be asked to choose one of ten colors to color in an outline of the individual described in the story. Children will then be asked to use the Likert scale to indicate how they thought the person described in the story felt, how confident they were in their color choice and lastly the affect rating for each individual color.

The Effect of Hand Restriction on Distance Perception for Desirable and Undesirable Objects.

Student(s):

Emily Elwood, Hannah Martin, Hilary White

Mentor(s):

Rebecca Fincher-Kiefer

Time/Location:

4:00pm - 5:30pm
College Union Ballroom

Balcetis and Dunning (2010) found that participants perceive objects as closer when they are desirable. In examining object likeability, Shen and Sengupta (2012) found that when one's dominant hand is restricted, the object is perceived as less desirable than when the dominant hand is free. Shen and Sengupta suggest that this is due to the inability to imagine grasping the object in the restricted hand condition. In the current study, we examined the effect of hand restriction on perceived distance of desirable and undesirable objects. We hypothesized that when a participant's dominant hand was restricted, it would eliminate seeing a desirable object as closer than an undesirable object. Trends in the means of Experiment 1 supported this prediction. Experiment 2 further explored these trends by strengthening the manipulation of desirability.

The effect of neuroscience jargon and images on ratings of scientific credibility

Student(s):

Emily Wakschal, Mary O'Mara

Mentor(s):

Kevin Wilson

Time/Location:

4:00pm - 5:30pm
College Union Ballroom

Prior research on neuroliteracy has identified a phenomenon known as the neuroscience bias, in which articles including neuroscientific jargon and images result in higher ratings of scientific credibility than both non-scientific and non-neuroscientific control articles (e.g., McCabe & Castel, 2008; Weisberg, Keil, Goodstein, Rawson, & Gray, 2008). Research has also shown that neuroscientific evidence has the potential to make abstract concepts seem tangible and/or comprehensible, which is often correlated with higher opinions of the data (Rhodes, 2014). In the current study, we explored one possible way in which these results could be applied to formatting research findings on oppressed minority groups. Specifically, we chose to examine the degree to which neuroscientific evidence impacts the belief that being transgender is involuntary. Since many people question the veracity of transgender individuals' gender identities, we hypothesized that texts with neuroscientific jargon and images would result in higher ratings of the validity of transgender identities than texts with genetic or psychological jargon and images.

The Effects of Common Attention-Deficit/Hyperactivity Disorder (ADHD) Medications on Social Approach and Anxiety in Fischer-344 and Sprague Dawley Rats

Student(s):

Alexandra Turano

Mentor(s):

Stephen Sivi

Time/Location:

4:00pm - 5:30pm

College Union Ballroom

It is known that both methylphenidate (MPH; Ritalin) and atomoxetine (Strattera) are involved in the modulation of noradrenaline/norepinephrine mechanisms mechanisms associated with vigilance and concentration. This relationship contributes to the popularity of these drugs for the treatment of attention-deficit/hyperactivity disorder (ADHD). Still, another component of ADHD that is less often addressed is an increase in comorbid anxiety. The current study aimed to measure the effectiveness of MPH and atomoxetine as social anxiolytics to Sprague Dawley (SD) and Fischer-344 (F-344) rats (a highly anxious strain) using the Social Approach-Avoidance (SAA) test developed by Nicolas and Prinssen (2006). In this test, the amount of time spent within the social and nonsocial compartments of the SAA apparatus was recorded as a measure of social approach or avoidance behavior. As a measure of anxiety outside of a social context, the Elevated Plus Maze (EPM) was used to determine the effects of the both MPH and atomoxetine on normal anxiety in both strains. Interestingly, while F-344 rats were significantly more socially anxious, as shown by time spent in the proximal zone of the SAA test, SD rats were the significantly more anxious strain according to the measure of anxiety outside of a social context EPM. Trends were also observed in which MPH increased both social and non-social anxiety while atomoxetine further decreased social and non-social anxiety in already low-anxiety animals. Further research will be necessary to contribute to the understanding of the pharmacotherapeutic uses of MPH and atomoxetine in the treatment of ADHD and comorbid anxiety.

The Influence of Head Tilt on Aggressive Behavior

Student(s):

Madelaine Trotter, Michelle Fox, Samantha Grom, Zachary Witkower

Mentor(s):

Christopher Barlett

Time/Location:

4:00pm - 5:30pm

College Union Ballroom

The present study manipulated nonverbal posturing of the head and measured resulting aggressive behavior. Nonverbal behavior research indicates the role of head tilt on social perceptions of myriad aggressive-related constructs. Although it is clear that head tilt is perceived as aggressive, the current research seeks to question the validity of this perception by testing whether manipulating head tilt can cause aggressive responding using an ice-bucket paradigm.

The priming versus embodied effects of temperature on social proximity and memory

Student(s):

Elise Sondheim, Gwen Houck, Jenna Swope

Mentor(s):

Rebecca Fincher-Kiefer

Time/Location:

4:00pm - 5:30pm
College Union Ballroom

Previous research has examined the influence of bodily experiences on our cognitions, specifically researching the physical effect of temperature on perceived social proximity (Ijzerman & Semin, 2009). In the current study, we attempted to replicate the effect of temperature on social proximity, and we included a measure of this temperature effect on memory for sentences that represented either warm or cold social interactions. Finally, we also compared embodied effects to priming effects. We hypothesized that participants holding a warm mug would have higher interpersonal closeness and remember more warm sentences than cold, but those participants holding a cold mug would experience less interpersonal closeness and remember more cold sentences. However, for those participants simply primed with the concept of warm or cold, the effects of temperature would be reduced or eliminated. The results of Experiment 1 showed main effects of behavior and temperature as predicted, but failed to demonstrate a reduced effect for the priming conditions. Experiment 2 investigated the effects of simulation compared to bodily effects on memory and social proximity.

The Shape of Smells: How your nose reacts to what your eyes see.

Student(s):

Joshua Rubinstein, Richard Cornish

Mentor(s):

Daniel McCall

Time/Location:

4:00pm - 5:30pm
College Union Ballroom

Spence and Zampini (2006) stated that cross-modal correspondences may have evolved as a strategy for the brain to effectively integrate multisensory phenomena. One such experience is flavor perception which associates the senses of taste and odor, along with visual cues. Hanson-Vaux et al. (2013) found that odors had an association with abstract visual objects or shapes such that intense and less pleasant odors are associated with sharp abstract shapes. Odors that stimulate the trigeminal nerve are considered “sharp” while olfactory odors are considered “round”. We hypothesized that if we primed participants with a sharp or round shape that this may influence their perception of an odor. In experiment 1 participants were primed with either a sharp or round shape and rated the sensory properties of trigeminal or olfactory odorants. Primes had no influence on odor perception, which may have been due to our prime not being strong enough. Therefore in experiment 2 we decided to have participants cut out a shape that was either congruent or not congruent (in sharpness) with the odor they smelled to see if the more intense priming experience would influence olfactory perception.

The Smell of Lies: How Untrustworthy Does Body Odor Make You?

Student(s):

Emily Lunardi, Jubal Horton

Mentor(s):

Daniel McCall

Time/Location:

4:00pm - 5:30pm

College Union Ballroom

Previous research has found that the presence of body odor decreases participants' ratings of trustworthiness when viewing a speaker. Other research has found that labels alter the perception of unpleasant odors. This paper reports an experiment designed to test whether participants were more or less likely to judge a person as truthful depending on odor exposure, and whether the label given to an odor influences their judgment. Participants viewed four videos of people who were telling the truth while the participants were exposed to either isovaleric acid or no odor. The isovaleric acid and the no odor bottles were labeled as either cheese or body odor. Participants' ratings of the speakers' friendliness, sincerity, and trustworthiness were measured. We predicted that isovaleric acid labeled as body odor would result in lower ratings of trustworthiness than the same odor labeled as cheese.

Trigeminal Determinants of the Perception of Odor Sharpness

Student(s):

David Casciola, Gregory Blum

Mentor(s):

Daniel McCall

Time/Location:

4:00pm - 5:30pm

College Union Ballroom

Previous research (Hanson-Vaux, Crisinel, & Spence, 2013) has demonstrated the existence of cross-modal associations between olfactory and visual stimuli. Odors that stimulate the trigeminal (pain) system (cinnamon, menthol, ginger, lemon) are associated with sharp abstract shapes, while odors that are purely olfactory (vanilla, strawberry, coconut, raspberry) are associated with round abstract shapes.

Recent work (Filiou, Lepore, Bryant, Lundström, & Frasnelli, 2015) has shown perception of trigeminal odors to be linked to experiences of four basic characteristics: intensity, warmth, cold, and pain. The current study sought to examine differences between these key factors in driving perception of an odor's "sharpness," in order to gain a greater understanding of how we perceive trigeminal odors. Participants were exposed to a number of trigeminal and olfactory odorants, and rated them across a variety of dimensions, then they attempted to identify them. We conducted a factor analysis to determine which of these aspects most explained variance in sharpness ratings among subjects.

Understanding of Envy and Preschoolers' Prosocial Behaviors

Student(s):

James Lincoln, Kuan Wang

Mentor(s):

Kathleen Cain

Time/Location:

4:00pm - 5:30pm

College Union Ballroom

Previous researches studied children's understanding of emotions such as happiness, anger and guilt. It was found that successful comprehension of those emotions facilitated children to resolve conflicts better in prosocial ways. The present study examines the understanding of a rather complex emotion, envy, and its relationship to preschoolers' subsequent prosocial behaviors. In the study, 24 children (aged 3 to 5) will hear two stories depicting a conflict that a child's lack of a desired toy causes hostile actions. One group of children will be given an explanation of the hostile actions in the first story as a training of envy understanding. At the end of the second story, children's understanding of envy and their proposed prosocial resolving strategies are measured. Expected results will show that children with training are more likely to attribute hostile actions to the lack of desired toy and propose more prosocial strategies than children who do not receive training. Implication to future emotion understanding as a part of preschool education is discussed.

When and Why We Lie: The Role of Darkness on Real and White Lies

Student(s):

Devin Garnick, Lauren Losak, Sarah Kearns

Mentor(s):

Rebecca Fincher-Kiefer

Time/Location:

4:00pm - 5:30pm

College Union Ballroom

Zhong, Bohns, and Gino (2010) found that people demonstrate dishonest behavior in darkness due to the illusion of anonymity. It has also been found that one of the primary reasons for why a person lies is to avoid hurting another's feelings, especially when the comment is not anonymous (Bryant, 2008; Erat & Gneezy, 2012; Gino, Ayal, & Ariely, 2013). In the current study we manipulated the brightness of the testing room to determine when participants were more likely to tell real lies versus white lies. We predicted that in the dark room, participants would be more likely to commit real lies than white lies; however, in the bright room, we expected that participants would be more likely to commit white lies than real lies. Experiment 1 failed to support the above prediction. Experiment 2 examined a different kind of dishonest behavior in judgments of moral acts and punishments.

Will Moral Ambiguity Change the Cleansing Effect?

Student(s):

Hannah Oliphant, Wesley Gregory

Mentor(s):

Rebecca Fincher-Kiefer

Time/Location:

4:00pm - 5:30pm
College Union Ballroom

Past research has found that washing one's hands results in harsher moral judgments of others as well as increased feelings of personal self-righteousness, this phenomenon is known as the cleansing effect (Zhong, Strejcek, & Sivanathan, 2010). The current study examined how the cleansing effect affects judgments of morally ambiguous situations and if priming participants to see both sides of an argument would influence this effect. We predicted that participants who washed their hands, but were not primed, would judge others' actions more harshly than those who had not washed their hands. However, those who had washed their hands but had been primed to think about both sides of an argument would show more neutral judgments, similar to those primed who had not washed their hands. The results of Experiment 1 indicated that those who had cleansed their hands had more extreme judgments of a negative situation than those who had not cleansed their hands. However, contrary to the hypothesis, those who were primed and cleansed their hands were actually more extreme in their judgments of morally ambiguous situations than those who had not washed their hands. Experiment 2 further investigated the effect of priming on the cleansing effect.

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