Undergraduate Symposium on Research, Scholarship and Creative Activity

"The opportunity to do research has enriched my undergraduate experience and solidified my career goals."

- Ashley Ferguson, Senior, Speech Pathology and Audiology Major

TUESDAY, MARCH 21, 1-5 P.M.
Kent Student Center Ballroom, Kent Campus

Sponsored by the Office of the Provost, Research and Sponsored Programs and University College
Welcome From the President

Congratulations on your participation in Kent State University’s fourth annual Undergraduate Symposium on Research, Scholarship and Creative Activity. Your involvement reflects a commitment of time and energy and a contribution to knowledge for which you should have a tremendous sense of accomplishment. Likewise, I take great pride in the creative, enterprising research activities of our faculty and undergraduates and look forward to further promoting student and faculty involvement in undergraduate research, annually showcased in this dynamic symposium.

Whether you are a student researcher or faculty mentor, thank you for expanding Kent State University’s mission of scientific discovery and engagement in diverse approaches to learning. Participating in research as an undergraduate student has the added benefit of clarifying career goals and improving critical thinking and communication skills – precisely the attributes that top graduate schools and employers are seeking.

I look forward to seeing you at today’s event.

With best regards,

Beverly Warren
President

Welcome From the Office of Academic Affairs

It is my great pleasure to welcome you to Kent State University’s fourth universitywide Undergraduate Symposium on Research, Scholarship and Creative Activity.

Upon graduation, you will go on to attend graduate or professional school, take a job in the private sector or in government, or volunteer in the community or abroad. No matter your choice, you will all face one challenge in common – how to use what you have learned here at Kent State in order to solve real-world problems.

By deciding to undertake a research project, a scholarly activity or a creative endeavor during your Kent State experience – an activity that has led you here to this afternoon’s symposium – you have chosen not to wait for the challenges to come to you after graduation. Instead, you have taken on these real-world challenges now!

Your research, scholarly and creative work throughout the past months or years speaks volumes about your drive, energy and enthusiasm for big challenges. I know that with this experience, you will go on to great things beyond Kent State. I congratulate you on your effort and I urge you to take pride in the accomplishments you are presenting today.

Sincerely,

Todd A. Diacon, Ph.D.
Senior Vice President for Academic Affairs and Provost
Welcome From the Vice President for Research and Sponsored Programs

Welcome to all the undergraduates involved in the fourth annual Undergraduate Symposium on Research, Scholarship and Creative Activity!

This symposium is a testament to Kent State’s investment in research and its commitment to provide meaningful research experiences and creative scholarship opportunities for undergraduate students. Participation in the symposium has grown steadily over the past four years, and it is our goal that the number of presenters will double in the next few years.

As you have learned by now, hands-on involvement in research and creative activities not only prepares you for your next step — whether it be graduate studies or launching your career — but also can be one of the most memorable learning experiences of your undergraduate years.

Congratulations on your posters/presentations and the culmination of all your hard work.

Sincerely,

Paul E. DiCorleto, Ph.D.
Vice President for Research and Sponsored Programs

Message From Symposium Planning Committee Co-Chairs

As co-chairs of the planning committee for Kent State University’s fourth annual Undergraduate Symposium on Research, Scholarship and Creative Activity, we congratulate you for submitting your work and for being a part of this exciting event. If you were to take the time to review the more than 180 abstracts — as select members of our committee have done and symposium judges will do today — we are confident that you, too, would marvel at the range, depth and general excellence of the work being done by your fellow Kent State students, in collaboration with experienced and engaged faculty mentors.

Whether your individual project involves scientific research, an artistic work, a performance or an oral presentation, you are to be commended for your effort. You should likewise feel a sense of pride for the unique and valued contribution you are making to undergraduate research, scholarship and creative activity at Kent State University!

On behalf of this year’s planning committee, we extend our best wishes for your continued academic success!

Sincerely,

Douglas L. Delahanty, Ph.D.
Professor, Psychological Sciences, Associate Vice President, Research Faculty Development

Ann Gosky
Director, Office of Student Research

About the Symposium

Hosting a symposium is a significant achievement, and the planning committee would like to thank all the departments and individuals who assisted in making this a successful event.

We would especially like to thank the chairs and directors, mentors, Sheila Pratt, Kevin Brosien and the University Communications and Marketing team, Rose Tran, Doug Nehrez and the IT team, Liz Richardson and all of our faculty, staff, judges and volunteers.

Again, thank you for your hard work, dedication and expertise. We are very appreciative of your assistance and look forward to future collaborations.
Do Research!

“My undergraduate research has enabled me to expand my horizons, apply concepts and techniques I’ve learned in class and gain valuable experience.”

— Brandon Whitecotton, Senior, Biology Major
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ARCHITECTURE – POSTER

Michelle Barrett, Senior, Architecture
Mentor: Brett Tippey, Ph.D.
Ildefons Cerda and l’Eixample: A Model for Urban Planning in the 20th Century

In the past, the walls of Barcelona were intended for protection. In 1850, the walls more so constrained Barcelona. The Eixample is the resultant solution to expand the city. Launched in 1859, the plan conceptualized a network-oriented approach far ahead of Cerda’s time. It re-imagined the city’s preoccupation with hygiene, traffic, and equality to which Cerda coined the term “urbanism.”

Abigail Dummermuth, Senior, Interior Design
Mentors: Pamela Evans, Ph.D., and Ji Young Cho, Ph.D.
How the Route Angularity Effect Influences Customer Behavior

Numerous studies have been conducted on the route angularity effect to explain and understand the relationship between the navigational behavior of customers and layout of department stores to increase sales. The question then arises, “In what specific ways does the route angularity effect influence the navigational behavior of customers and their buying habits within a department store?” Research was conducted over the course of four days over a one-hour period. Results identified that customers felt the space was congested and way-finding patterns were difficult to discern. Overall, even though the data supported the implications the route angularity effect had within the Universo Sport Duomo department store, further research is necessary to develop a better understanding of the relationship between the customer and the department store layout.

Jonathon Davis, Senior, Technology
Mentor: Roberto M. Uribe-Rendon, Ph.D.
A 3-D Printer Arc Reactor Design

The project to be presented will be a 3-D printed design of an arc reactor with a usable tool set behind it. An arc reactor is a fictional device used as a sustainable, safe energy source used as a means of study for fusion. The project will be used as a symbol stating that to make a brighter future, all it takes is an idea, ingenuity and creativity.

Katelyn Hannigan, Senior, Architecture
Mentor: Peter Marks, M. Arch.
Climate Analysis Procedure

An architect or engineer’s priority within the design process of a building begins with the climate analysis. In this study, a standardized procedure was produced to ensure an effective and efficient process. Current methods of climate analysis can be arbitrary with vague standards, which could lead to redundant information. Among the resources, climate consultant was the main factor in completing the climate analysis in this study. Many of the graphs produced by the system break down the information into time specific graphs. By minimizing the findings to annual graphs when available, it reduces the decoding process of multiple repetitive graphs; therefore, speeding up time while ending with the same desired results.

Caitlyn M. McCausland, Senior, Architecture
Mentor: Brett Tippey, Ph.D.
Modernisme in Urbanized Catalonia

The economic prosperity that resulted from rapid urbanization during the late 19th-century provided the Catalonians with the awareness, resources and wealth needed to find an identity. Modernisme was the artistic and architectural response to this prosperity. This paper will discuss how the works of Modernista Josep Puig i Cadafalch solidified the Catalanian character during the critical days of the early 20th century.

Mary Myers, Senior, Architecture
Mentor: Brett Tippey, Ph.D.
Jewish and Moorish Influence on Mid-Twentieth-Century Spanish Architecture

Modernisme and celebrated the optimism of the current day by honoring the properties of materials, acknowledging function with aesthetics, and creating asymmetrical forms. I will conduct this investigation by cross-referencing the architect’s personal writings, drawings and sketches with secondary historical accounts of the political and cultural, and architectural atmosphere.
Aaron Penn, Senior, Applied Engineering  
Mentor: Roberto Uribe, Ph.D.  
Design of A Self-Sustainable, Low-Cost Home

A design of a low-cost home that is completely self-sustainable is presented. This home will be capable of producing its own food and energy, in addition to harvesting rainwater to be filtered, and tailored to fit the modern urban lifestyle. The home will be constructed of sustainable materials and will feature large windows and glass sliding doors. Its flat roof design will be able to capture rainwater and harvest energy from the sun. To produce food, the home will also have a greenhouse and a separate area for free range chickens. The agricultural design of the home may also qualify it for tax breaks for the property owner.

Jessica Schultz, Senior, Architecture  
Mentor: Brett Tippey, Ph.D.  
Miguel Fisac’s Direct Influence in Modern Spanish Architecture Through Concrete Innovation

During the late 1900s, Spain encountered a new spirit and sense of optimism, one phase of which was ushered in by Franco’s dictablanda. This new leniency allowed for more freedom in not only politics or social constructs, but also architecture. One very obvious example of this optimism in architecture is illustrated through Miguel Fisac’s bone architecture, which is known to have heavily influenced the modernization of Spanish Architecture. This paper will argue that his work has done so by influencing work of architects to follow him such as MVRDV and Ensamble Studio. Primary and secondary sources will be used to support this claim.

Faris Turkistani, Senior, Architecture  
Mentor: Brett Tippey, Ph.D.  
The Modern Elements Inside Moorish Spatial Design

For 700 years, Muslims ruled the Iberian Peninsula. In that period, a unique architectural vernacular was established combining the traditional Islamic architecture with the locals with familiarity of the land. This architectural combination resulted in innovative methods of designing the spatial qualities that was a vast improvement over the architecture of Visigoth. Buildings such as Alhambra and the Great Mosque of Cordoba show excellent spatial qualities that improve the experience and provide aesthetic and functional properties. The architecture of Spain from the 19th and 20th centuries has been perceived as an imitation of regional styles. However, the adaptation of Andalusian architecture resulted in a rational architecture with modern sensibilities. The research aims to analyze the reasons for these successful designs in and their relation to Moorish architecture.

Felipe J. Valadez, Senior, Architecture  
Mentor: Brett Tippey, Ph.D.  
The Exiled Spanish Architects and Their Influence Now in Mexican Architecture and Culture

As exiled Spanish architects lived in Mexico, they continued to practice and develop their ideas of modernity, eventually creating a new hybrid Mexican-Spanish form that redefined the Mexican form. With the Spanish Civil war at a conclusion and the Republic of Spain in exile, Spanish architects were among those exiled, leaving Spain with what seemed as small setback in finally realizing a Spanish architecture. With some of these influential architects flowing into Mexico, the Mexican architecture was changed and greatly influenced by these new Spanish revolutionaries and, even to this day, we can see a great deal of Spanish architecture in Mexican architecture. Sources will include drawings, personal journals, published works, etc. written by architects including works by Juan Ignacio, Felix Candela, Fernandez Balbuena, and Giner de Los Rios and others like them along with architects who studied under them. Looking at the next-generation architects will also be evaluated and considered.

Rebecca Alonis, Senior, Architecture  
Mentor: Rui Liu, Ph.D.  
Beneficial Use of Plastic Bottles in Sustainable Building Construction

Yearly, 14 billion pounds of trash are compiled and much of it is plastic. More than 4.8 million tons of plastic are dumped into the ocean every year, thus, contaminating our waters and shores with garbage and endangering sea life. In an attempt to recycle plastic bottles and keep less waste accumulating, there have been building projects that incorporated plastic bottles in building construction. From Oscar Mendez’s projects, to the plastic bottle village created by Robert Bezeau, or from communities in Nigeria using plastic bottles to create a building that is both bullet and fire proof, all prove that this material can be integrated with our construction methods. This study investigates how plastic bottles form structurally sound buildings through different construction methods.

Devin Heinlein, Senior, Architecture  
Mentor: Brett Tippey, Ph.D.  
Eduardo Torroja and the Introduction of Reinforced Concrete to 20th-Century Spain

During the early 20th century, Spanish architecture largely ignored global technological and stylistic advancements in favor of creating a national style. They looked back to past works, mostly for their aesthetics. However, engineer Eduardo Torroja began to experiment with reinforced concrete in both the common Historist style and the building Rationalist style. His work introduced Spain to a new way of designing buildings by Robert Bezeau, or from communities in Nigeria using plastic bottles to create a building that is both bullet and fire proof, all prove that this material can be integrated with our construction methods. This study investigates how plastic bottles form structurally sound buildings through different construction methods.

Previous focus on Torroja’s work has been on his advancements in rationalism. By examining Torroja’s writings, critical reviews of his work and his original drawings, this paper will look at his early usage of reinforced concrete. This paper will show how this new material influenced Torroja and his contemporaries to reconsider reinforced concrete as a primary material.
ART/FASHION - POSTER

Stewart Blackwood, Junior, Theatre Studies, in collaboration with Ross Downing, Junior, Music Education/Music Technology

Mentor: Nicholas Drashner, M.A., M.F.A.
Sound Design and Composition Studio Collaboration

This project is a collaboration between theatrical sound design and music composition departments. Our goals for the project are professional grade recordings of experimental compositional pieces for the underscore of this spring’s main stage production: Shakespeare’s Macbeth. Working together, we can experiment with different ways of crafting and experimenting with sounds. Through this process, we hope to expand the way all parts of the team think about creating feeling within an audience. We can raise the level of sound design for productions at Kent State University, and increase both the exposure of composers’ works as well as their levels of experimentation.

Madison Booth, Senior, Fashion Design

Mentor: Linda Ohrn-McDaniel, M.F.A.
Who’s The Fairest: A Study on Gender in Fashion

“Who’s the Fairest?” is a gender-neutral collection inspired by the gender roles instilled on us as children through mediums like fairytales. In the classic stories, the prince is always strong and brave, and the princess meek and quiet. After researching various online pleas and talking to members of the LGBTQIA community, I’ve noticed several concerns related to design and functionality. I also looked at gender-neutral fashion companies and noticed a disheartening trend: most of these “progressive” lines were manufacturing shapeless, muted garments that closely resembled oversized menswear. Therefore, I used historic details and a soft color palette to design a collection for bodies that are masculine, feminine and anywhere in between.

Jack Bowers, Senior, Fashion Merchandising

Mentor: Catherine Amoroso Leslie, Ph.D.
“American” Cowboy Style: Global and Historical Origins of Clothing of the American West

Clothing fashions have evolved through institutions that existed for the purposes of trading goods coupled with the effects of cultural melding. “Inventions” of the American West are often seen as completely original or wholly American. This research explored the idea that, from their conception, aspects of cowboy apparel and garments of the American West can be traced to more than one or two continents, including influences from Europe, Asia and the indigenous inhabitants of both North and South America. The findings of this study can develop recognition of the cultural connectivity and global nature that have always been defining features of fashion and costume. This will encourage a positive outlook of ways in which fashion reflects differing cultures and human interactions.

Rachel Broas, Senior, Fashion Design

Mentor: Kendra Lapolla, M.F.A.
The Growth of a Full-Time Fashion/Lifestyle Blogger

Blogs and social channels have the ability to connect readers and the content creator/website owner in a way that normal company marketing cannot. This study investigates what methods are used to grow blogger platforms, along with which methods are used in order to monetize their creative content. Upon IRB approval, online surveys will be administered to full-time fashion and lifestyle bloggers to study further in depth the steps bloggers take in order to run a full-time career of their websites and social media channels. Preliminary research and findings suggest through brand partnerships, blogger relationships, SEO optimization and the utilization of social media, bloggers have the ability to go full-time.

Ashley Buersmeyer, Senior, Dance; Brittany Kloes, Senior, Chemistry; Madison DeLong, Senior, Dance; and Abigail Schneider, Senior, Dance

Mentor: Jeffrey Marc Rockland, M.F.A.
East Meets West: A Tribute to King Bhumibol Adulyadej

In January 2017, nine Kent State University students traveled to Bangkok and Hua Hin, Thailand, to collaborate with six graduate students from Suan Sunandha Rajabhat University. While in Thailand, the students were curious to observe whether a group of American students could effectively ally with Thai students and guest faculty to co-create a work of choreography honoring the passing of the late King of Thailand. The participants shared their artistic cultures and exchanged their styles through student-teacher relationships, tuition and improvisation classes. They brought this newfound knowledge into rehearsals to successfully create an eight-minute piece that utilized pointe, jazz and Thai Classical dance styles. This collaboration supported the research and development of new forms of artistic expression that represent diversity and promote global understanding.

Evan Costello, Senior, Fashion Design

Mentor: Vincent Quevedo, M.S., M.F.A.
“Cruising” Senior Collection

“Cruising” is my graduating collection as a senior fashion design student. I was originally inspired to create this collection by the legendary 1969 Stonewall Riots in an attempt to both fully accept and celebrate my culture and its history. During the design process and the resulting final collection, I have attempted to explore the modern male experience. Some of the styling and fit of garments in the collection is overtly feminine, which illustrates a cyclical relation between masculinity and femininity; overcompensating with manliness often leads to the reverse. Other garments are faithful recreations of athletic uniforms, which act to mock the expectation of all men to be athletic. Through the final collection, I have attempted to illustrate society’s specific expectations for what a straight man should be, and what he can’t be. I believe these expectations are often a factor in the troubling and hateful actions of man.
Kendall de Perrier-Lewis, Junior, Fashion Design  
**Mentor:** Catherine Amoroso Leslie, Ph.D.  
**Oppression: A Creative Exploration Based on Stigmatization of Clothing Throughout History**

This research explored the concept of stigma in dress history and used it as creative inspiration. Clothing can make us identify as individuals or with groups, yet also can serve as vehicles for isolation and discrimination. These include religious oppression, constrained garments, sumptuary laws, along with language and nomenclature. Through primary and secondary research sources, instances of stigmatization through dress were identified. These served as a foundation for creative exploration, producing five contemporary fashion looks and one example garment. This study expands our understanding of oppression within society and how we can learn to harness stigmas and use them as a tool for empowerment.

Gabriela Discopoli, Senior, Fashion Design and Kendra Lapolla, M.F.A.  
**VIAJIYU Collaboration – An Experiment in Co-Creation and Design**

The purpose of this study is to explore collaborative design opportunities in the footwear industry, specifically for VIAJIYU, a small made-to-measure women’s shoe company based out of Florence, Italy. After completing a market research survey, design ideas were created based on customer preferences and further evaluated by lead customers from the survey. This research study helped to build on an understanding of the opportunities of co-creation among custom shoe design and development, with a focus on the impact of current VIAJIYU customers.

Miriam Ennin, Senior, Fashion Design  
**Unveiling Perceptions**

Unveiling Perceptions is a high-end bridal collection that utilizes the silhouette and layering lines of an onion as a symbolic representation of the idea that perception is a matter of what is seen rather than what is a matter of fact. While the flaws that we may see in ourselves may be our definition of weakness, they are seen as treasures in the eyes of those who cherish us the most.

Emily Gambone, Senior, Fashion Merchandising; Tara Kickert, Senior, Fashion Design; Kayla Hamilton, Senior, Fashion Design; and Adriana Young, Junior, Merchandising  
**Development of Product Line for New Market Segment for Coastal Pet Products, Inc.**

For our product development capsule project, we were challenged to design and promote a new product line for Coastal Pet Products, Inc., to increase visibility and market share while targeting millennials. We focused on millennials who travel and move often, and our research into their lifestyles led us to create "NOMAD"—multifunctional and aesthetically pleasing travel-oriented products. Our project was one of seven chosen to present to Coastal Pet Products, Inc., who determined that ours was superior in terms of market research, product design, marketing strategy, and potential saleability. We sold our intellectual property to Coastal Pet Products, Inc. officials who are looking to incorporate our ideas into their future lines.

Victoria Haworth, Senior, Fashion Merchandising  
**Mentor:** Jihyun Kim, Ph.D.  
**Vive la Révolution: An Examination of the Fourth Industrial Revolution and its Impact on Various Industries, with a Specific Focus on the Fashion Industry**

The Fourth Industrial Revolution is the latest installment in a series of major technological and manufacturing developments; however, it is proving itself vastly different from its predecessors, due to its speed and widespread effect. The revolution stands to impact all industries across the globe, leaving no business or person untouched, including the fashion industry. This study, therefore, aims to deepen our understanding of the current and future impacts of the Fourth Industrial Revolution on the fashion industry and explore plausible solutions to champion fashion’s embrace of the Revolution. If the industry is to survive, it is vital that it incorporate technological advancements, including artificial intelligence, robotics, and 3-D printing, with developments in materials science, in order to find new and sustainable ways of satisfying consumer desires.

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Haviet Huong, Junior, Fashion Design  
**Mentor:** Catherine Amoroso Leslie, Ph.D.  
**The Maker: An Innovative Artisan Apparel Brand and Retail Partnership**

The millennial generation is driving changes in many aspects of the retail industry. These consumers crave authenticity, limited availability and quality products, along with sustainability and social responsibility. This study investigated opportunities presented by a partnership between Etsy and Macy’s, with research guiding development of a new clothing line and marketing strategy that addressed millennials’ unique demands while presenting a partnership model that can be successful for all stakeholders. The Maker is an innovative apparel brand that connects the designer with the artisan, the artisan with the end-user customer, and traditional handicraft with modern technology. The shopping experience features customer-interactive technology, demonstrating that by harnessing individual strengths, firms can work collaboratively to flourish in a rapidly changing retail landscape.
Sarah E. Johnson, Senior, Fashion Design  
Mentor: Linda Ohrn-McDaniel, M.F.A.  
Woman Holding a Balance

This thesis focuses on empowering feminine design through the application of historic reference to the Dutch Golden Age in order to assert fashion design as a form of engineering. The process of an engineer and a designer are one and the same: conceiving, innovating and creating to artfully bring something about. I propose to present the elements of this research so as to reconcile design as a form of engineering in a way that reflects my own analytical approach to fashion design. There will be particular emphasis on advanced patternmaking, tailoring and construction techniques that emphasize the calculation and craftsmanship involved in translating conceptual design into a wearable form.

Jaanai Jones, Senior, Fashion Design  
Mentor: Linda Ohrn-McDaniel, M.F.A.  
Equipped

This senior collection examines the idea behind firefighter uniforms. The sole purpose of the uniform is about protection and equipping the firefighter in multiple environments. The purpose of this collection is to equip the wearer with modern, fashionable pieces that are comfortable and functional in multiple conditions.

Sarah Kauffman, Senior, Fashion Design  
Mentor: Linda Ohrn-McDaniel, M.F.A.  
Intergalactic Space Princess: A Study in Volume and Line

The BFA collection “Intergalactic Space Princess” examines stripes and their relationship to volume using surreal or trompe l’oeil effect printing and beading. Beyond the basic concept of line and volumes, the collection also follows a comic book narrative of a space princess in her travels through a wormhole, landing in 1970s New York. After much dancing and exploring, she decides to stay on Earth and enjoy life in the city. This collection is directed towards a high-end luxury and couture market. Especially in the world of couture, fashion is an escape from reality, telling creative and well-marketed stories. This collection serves as a light-hearted narrative of a space princess while still challenging the design of each garment with the principles of line and volume.

Arianna Likouris, Senior, Fashion Design  
Mentor: Linda Ohrn-McDaniel, M.F.A.  
Aphosiosi

Aphosiosi means “loyalty” in Greek. This is a non-traditional eveningwear collection illustrating the idea of loyalty to one’s culture, community and upbringing. Research included looking at symbolism and motifs, collaging to form shapes and silhouettes, print development, sketching, and reading about cultural loyalty and the psychology behind it. First and second muslins were sewn and critiqued throughout the semester, which helped to refine the collection and lead to its final stages. The goal of this collection is to get the viewer to understand and think about how one can obtain a sense of identity through their heritage. As a result, Aphosiosi symbolizes the passion one has for their culture and the identity that is kept throughout their life.

Grace Lilly, Senior, Fashion Merchandising  
Mentor: Jewon Lyu, Ph.D.  
3-D Printing and the Millennial Generation

The following research depicts the attitudes of millennials towards technology, and more specifically 3-D printing. Millennials will be the first generation to acclimate themselves to the changing technological landscape largely because of their fluidity and ease with using various methods of technology in their everyday lives. 3-D printing will begin to be a common practice for apparel production and will one day make the shift into consumer’s homes. 3-D printing will fulfill the desire of millennials to incorporate mass customization into their everyday lives. This research is designed to explore the millennial generation’s attitudes towards 3-D printing. It is expected millennials with prior experience with 3-D printing will be open to pay a fee as well as exhibit positive perceptions towards 3-D printing.

Gina Lytz, Senior, Fashion Design  
Mentor: JaYoung Hwang, Ph.D.  
Ruthie

What is the most effective way to embed a story into a collection? I used this opportunity of designing a thesis collection to pay homage to an important person in my life. Earth tones, minimalist silhouettes and the manipulation of toile wallpaper are used to tell her story. This particular wallpaper is the one I remember covering the walls of her house when I was a little kid. I want it to be apparent there is a deeper story behind this collection.

Emily McCullough, Sophomore, Fashion Merchandising  
Mentors: Catherine Amoroso Leslie, Ph.D. and Harriet McLeod, Ph.D.  
Product Safety Recalls in Children’s Wear: What Does the Consumer Know?

Media coverage of safety recalls in children’s products often includes hard goods such as child seats and furniture. Soft goods, such as children’s wear may also contain potential hazards that can lead to choking, scratching or other injuries. Current safety guidelines recommend that snaps, buttons, etc. be used instead of drawstrings in children’s wear because of the potential for strangling. Using a content analysis approach, the researchers will explore the product safety laws and violations that have occurred in children’s soft goods such as apparel, footwear and accessories over the past three years and how these violations have been communicated to the fashion industry professionals and consumers.
Marissa Mally, Senior, Fashion Merchandising
Mentor: Jowen Lyu, Ph.D.
Wearable Technology - More than a FitBit

The latest innovations in technology are changing every day. One such issue is the generation of textile waste during production. In the traditional pattern making and fabric cutting approach, up to 15 percent of fabric is wasted, which, if not recycled ends up in landfills. Zero-waste cutting is a design approach focused on sustainability where no fabric is wasted during production. My challenge was to design a wearable and practical athletic apparel, suitable for running, but utilizing zero-waste methods. The result was a three-piece athletic outfit comprised of a T-shirt, sports bra and leggings combining aesthetic appeal, functionality and sustainability. This project is unique as not much research has been conducted combining zero-waste cutting with active sportswear.

Morgan Manuel, Junior, Fashion Design
Mentor: Archana Mehta, M.A.
Minimal Waste Athletic Wear

The fashion industry has long been guilty of having a negative impact on the environment. One such issue is the generation of textile waste during production. In order to increase diversity this study uncovered a website that incorporated this research in an exciting and cohesive way. This research demonstrated that a website that incorporated this research in an exciting and cohesive way. This included interactivity to maintain viewer interest. We constructed a website that incorporated this research in an exciting and cohesive way. This research demonstrated that an appealing web format that reflected a social media presence designed to engage digital natives. This included interactivity to maintain viewer interest. We constructed a website that incorporated this research in an exciting and cohesive way. This research demonstrated that an appealing web format that reflected a social media presence designed to engage digital natives. This included interactivity to maintain viewer interest. We constructed a website that incorporated this research in an exciting and cohesive way. This research demonstrated that an appealing web format that reflected a social media presence designed to engage digital natives. This included interactivity to maintain viewer interest. We constructed a website that incorporated this research in an exciting and cohesive way. This research demonstrated that
**Paula Oyedele-Caleb, Senior, Fashion Design**  
**Mentor:** Ja Young Hwang, Ph.D.  
**Pawada: Distinguishing the Lines Between Appropriation and Appreciation of West African Culture in the Western World**

This study is primarily concerned with the possibility of redirecting cultural appropriation into appreciation in a way that is respectful to that culture, but with an innovative approach, so as to promote unity in a society that is so ethnically diverse. How can we protect the traditional parts of a culture in a way that can be appreciated by the mass society? The word “Pawada” is a Yoruba word, it means “to change.” More specifically, it translates roughly to “one that has changed his ways.” This will be accomplished by utilizing aspects of fashion technology, such as digitalized prints and incorporating traditional elements from West African cultures; specifically, the Masai tribe of Kenya and Tanzania, Adire from Nigeria and color inspiration from the Kente cloth of Ghana.

**Katryn Seeburger, Senior, Fashion Design**  
**Mentor:** Linda Ohrn-McDaniel, M.F.A.  
**Lieblingspulli: Favorite Sweater**

How can artisan- and mass-produced goods be approached to form a collection that is sustainable, affordable and adaptable by the consumer? By considering how both production cycles have a place within sustainability, this collection proves that the current industry can be altered to be more mindful to benefit both consumer and retailer. Using personalized goods to supplement wardrobe staples, this collection created knitwear that allows the consumer to be eased into choosing well-made goods to create a sustainable closet. This collection found that a wardrobe does not have to lose its individual identity in order to be sustainable; it just has to be more mindful of where and how each piece was created.

**Delaney Sullivan, Senior, Fashion Design**  
**Mentor:** Linda Ohrn-McDaniel, M.F.A.  
**S.ave O.ur S.eas**

Save Our Seas encompasses both the beauty and ugliness within our oceans. As human consumption continues and our oceans are polluted and dying, phenomena such as the bleaching of the coral reefs occur, creating brilliant white corals and a foreboding message. Sustainable solutions to consumption must now begin to be employed in our industries.

**Austin Coats, Senior, Dance**  
**Mentor:** Kim Karpanty, M.A., M.F.A.  
**“Caged Bird”: An Exploration and Poetic Demonstration of the External and Internal Mindset**

“Caged Bird” is inspired by the poem of the same title by Maya Angelou. The purpose of the piece is to show the contrast between a caged bird and a free bird, like Angelou speaks of in the poem. “Caged Bird” is also inspired by the choreographer’s journey in this new world of “dance.” After the choreographer was exposed to this unfamiliar world, the choreographer felt like a “caged bird” and would always escape to an introspective state. Yet on stage or other places, the choreographer felt free. Questions as to “why was this happening” and “how can this be expressed” were explored. Through multiple trial and error investigations, showings, and various types of documentation, “Caged Bird” was created.

**Madison Kalsom, Senior, Fashion Design**  
**Mentor:** Linda Ohrn-McDaniel, M.F.A.  
**Patterned Infringement**

Patterned Infringement explores the way copyright law affects the art and the fashion industry. Fashion collections often take inspiration from art or prints that are updated, reimagined, or changed. But there is a fine line between inspiration and copyright infringement. Taking indirect inspiration from the work of Yayoi Kusama and Nellie Row Mae I created prints. I further manipulated those prints by combining them, laying other fabric over them and altering the print itself. Additionally, I played with the concept of a print by creating a pattern through embroidery. By doing this I show how to successfully use inspiration without infringing artists.

**Dennis J. Meacham, Junior, Music**  
**Mentor:** Keith Heinlein, M.M.  
**Low Register Studies**

This project was created to develop a method book written for tubists to develop their low register as an extension of their mid-register. The low register for the tuba is the most widely recognized aspect of orchestral tuba playing, such as in Wagner’s Ride of the Valkyries and Respighi’s Pines of Rome. There is, however, a deficit in method books for tuba players to develop their low register. The few books targeting low register, unfortunately, were originally for other instruments and/or written by non-tubists.
Ricki Robinson, Senior, Fashion Design  
Mentor: Linda Ohrn-McDaniel, M.F.A.  
Altered  
Altered is my response to the materialism facing the fashion industry. Designing this collection proves fashion is so much more than materials and fads. My inspiration is how the improper care of clothes can influence the design process. To emphasize the disposal of clothes, I experimented with different manipulations. Wrinkle pleating makes the garments appear as if they were just balled up and now it is ready to wear. The majority of my garments in my collection are knitwear. I experimented with different techniques to resemble certain distressing properties. I have incorporated a smoking-like technique with the knits to resemble wrinkles, and to further stress asymmetry. This is a collection where consciousness and fashion meet.

Allison Beckwith, Junior, Biotechnology  
Mentors: Laura Leff, Ph.D. and Paul Ayayee, Ph.D.  
Effects of Stream Quality on Insect-Gut Associated Denitrifying Bacteria Abundance  
Gut bacteria in macroinvertebrates in streams and rivers contribute to nitrous oxide (N2O) emissions from these systems through partial denitrification. Denitrification is an anaerobic microbial process which converts nitrates (NO3−) to dinitrogen (N2), removing excess nitrogen from these ecosystems. Poor stream quality negatively impacts the diversity and abundance of certain macroinvertebrate taxa, such as stoneflies, mayflies and caddisflies. Stream quality impacted macroinvertebrate taxa, with more sensitive insect taxa present in WB relative to TC. Bacterial 16S rDNA gene, and the denitrification genes nirK and nosZ were detected in all samples. The quantification of bacterial genes in all samples, however, remains to be investigated.

Paige Bidinotto, Senior, Biochemistry; Gemma Casadesus, Ph.D.; Jeff Blair, Graduate Student, Biomedical Sciences; and Sabina Bhatta, Graduate Student, Biomedical Sciences  
Mentors: Gemma Casadesus, Ph.D.; Jeffrey Blair, Graduate Student, Biomedical Sciences; and Sabina Bhatta, Graduate Student, Biomedical Sciences  
Neuroanatomical and Cellular Localization of Luteinizing Hormone in the Mouse Brain  
Previous work in our laboratory demonstrates the importance of luteinizing hormone (LH) signaling in learning and memory and AD, yet the neuroanatomical and cellular localization of LH has not been determined. Immunofluorescence was used to determine in which brain regions and cellular types LH are located. Immunoreactivity of LH is observed in areas associated with emotion as well as learning and memory, with high expression of LH visualized in areas of critical importance in AD. Furthermore, we have also identified the expression of LH and GAD67 to be neuronally co-localized and the expression of LH to be localized to inhibitory neurons. Our findings demonstrate that LH localization and the co-localization of LH and GAD67 further support a direct role of this hormone in cognition.

Jennie Branco, Senior, Biology  
Mentor: David Costello, Ph.D.  
Review of Regulatory Policies for Copper and Silver Water Quality Criteria  
To combat climate change and urbanization, water management policies must be updated with the most current scientific information. We compared two metals, a well-studied pollutant (copper [Cu]) and emerging contaminant (silver [Ag]). We assessed water quality criteria for each from the United States, Australia and New Zealand, South Africa, Canada, and European Union for intent and implementation. Additionally, we conducted standard chronic toxicity tests for silver and copper on the freshwater snail Lymnaea stagnalis to assess effectiveness of each regulation in protecting ecological integrity. L. stagnalis were individually placed in test solution (0–32 µg/L for Cu and Ag) for 28 days to measure mortality and growth. Preliminary results suggest greater Ag toxicity; however, Ag water quality criteria may not offer protection in some jurisdictions.
Chuck Campana, Senior, Nursing
Mentors: Robert Clements, Ph.D. and Joshua Pollock, Ph.D.
Evaluating Stereoscopic Effects with EEG of Memory Formation and Regional Brain Activity

Previous studies have indicated that students have trouble learning concepts that have a spatial component to them. Recent research has suggested that stereoscopic presentation of these objects may promote better learning. To understand the processes which contribute to spatial learning a neurophysiological approach is necessary. Therefore, in order to investigate the effectiveness of stereoscopic presentation and the neural correlates of it, an Electroencephalograph (EEG) was used. Participants were presented with images in both 3-D and 2-D of an organic molecule. During the tasks, the molecule rotated across three different planes, changed colors, and changed focal distance. The data collected were then analyzed using EEGLAB for MATLAB. The brainwave activity in these components was recorded and the components were correlated with one another.

Emily Creque, Senior, Biology; Priya Putta, Graduate Student, Biological Sciences; and Edgar E. Kooijman, Ph.D.
Mentors: Priya Putta, Graduate Student, Biological Sciences, and Edgar E. Kooijman, Ph.D.
The Effect of Lipids on the Binding of Proteins Expressed under Stress in Plants

Diacetylgllyceroliprophosphate (DGPP) is phosphorylated phosphatidic acid (PA). Under stress conditions, plants respond via signaling cascades, some involving regulating lipid metabolism. DGPP is a lipid that is elevated under stress, following a stress-induced rise in PA levels. We examined the lipid-protein interactions between DGPP and proteins that bind to PA to analyze a possible correlation between these two lipids based on the proteins that they bind.

Richard M. Cukelj, Senior, Biology; Elda Hegmann, Ph.D.; Ernest Freeman, Ph.D.; Jennifer McDonough, Ph.D.; and Robert Clements, Ph.D.
Mentors: Elda Hegmann, Ph.D.; Ernest Freeman, Ph.D.; Jennifer McDonough, Ph.D.; and Robert Clements, Ph.D.
Use of Porous Elastomer Foams to Support Long-Term Three-Dimensional Neuronal Cultures

In order to effectively study the interactions that occur between neurons after an extended period of time and spatially in the brain, it is necessary to have reliable, repeatable studies. This is difficult with two-dimensional cell culture techniques. Here, we present a platform to study neuronal networks for extended periods in vitro using three-dimensional (3D) elastomer foams. Elastomer foams were constructed with pore sizes ranging from 150μm to 400μm with 40μm secondary pores which allowed human neuroblastoma cells (SH-SY5Y) to adhere and interact with the foam and be sustained for long-term studies, more than 60 days. Being able to sustain neurons for this long in 3-D arrangements allows for a better representation of 3-D tissues, making this method applicable for studying neurodegenerative disease states.

Melanie Darrah, Sophomore, Zoology, and Joseph Fischer, Graduate Student, Biological Sciences
Mentor: David Ward, Ph.D.
Summertime Foraging Behavior of South African Vervet Monkeys

We set up a giving-up density experiment with Vervet monkeys at the Wits Rural Facility in South Africa. We placed seven lidded buckets containing peanuts and wood blocks at different heights within, and distances away from, three marula trees. The blocks served as obstacles, mimicking the time and effort spent in natural foraging. The amount of peanuts eaten from each bucket after a foraging period indicates more favorable feeding patches. We realized the peanuts were not favorable due to high summer food availability. Instead, we observed the monkeys, recording behaviors such as vigilance, foraging, and interacting with peers and offspring. These ethogram samples suggest the troop’s comfort level in their environment, their apparent stress towards food availability, and their perception of nearby predation risk.

Sydney Gilmer, Junior, Biology, and Daniel Krieger, Senior, Biology
Mentor: David Ward, Ph.D.
Effects of Elephants on Vegetation Along a Fenceline Contrast in South Africa

We assessed the degree of damage of two common plant species, marula Sclerocarya birrea and the mountain aloe or flat-flowered aloe Aloe marlothii in two neighboring game reserves along a fenceline with respect to the presence of African elephants Loxodonta africana. One of these reserves, Thornybush, had 40-50 elephants while the other reserve, the Wits Rural facility, contained no elephants, although elephants had broken into a select region briefly during a recent drought. We measured the browse height of S. birrea relative to overall tree height and trunk circumference to establish the differences among the three different areas. We also measured the presence/absence of A. marlothii in these game reserves. We found no A. marlothii in the reserve with elephants, while this plant species was quite common where there were no elephants, despite the absence of soil differences. In the section of the Wits Rural facility where the elephants had broken in, there were considerably more damaged A. marlothii than in the section of this reserve without elephants. We also established the association between the size of the aloe and elephant consumption.

Heather Greier, Senior, Biology
Mentor: Gregory Smith, Ph.D.
Population Dynamics of Feral and Free-ranging Domestic Cat Colonies with Implications for Management

As the population of feral cats increases in the U.S., the repercussions have both become apparent to scientists and caretakers and has sparked an increase in interest about this issue. While debates continue about the most effective control methods for these non-native predators, basic ecological data are lacking; for example, estimates of immigration and emigration rates into and out of feral cat colonies. In a previous pilot study an attempt was made to add this important empirical data to the debate. Although results of the previous study were inconclusive, it became clear that these data were important and further investigation was warranted. Education of the public is also critical; without it, we cannot create a collaborative effort in enforcing these programs and reducing cat overpopulation.
Kayla Hamdan, Junior, Biology; Spencer R. Andrei, Graduate Student, Biological Sciences; and Derek S. Damron, Ph.D.

Mentors: Spencer R. Andrei, Graduate Student, Biological Sciences, and Derek S. Damron, Ph.D.

Nitric Oxide Bioavailability in Diabetic Cardiomyocytes: The Role of Propofol in Superoxide Scavenging

A pathological mechanism underlying diabetic cardiomyopathy involves the reaction of nitric oxide (NO) with superoxide to form peroxynitrite. We hypothesized that the intravenous anesthetic, propofol, would act as a superoxide scavenger, thereby increasing NO bioavailability and returning superoxide and peroxynitrite levels to near baseline values. Our results indicate that NO levels are decreased in diabetic CMs due to its reaction with elevated superoxide levels, producing excessive amounts of peroxynitrite. Propofol treatment restored pathologic NO, superoxide and peroxynitrite accumulation to near healthy levels.

Meghan Hollis, Senior, Zoology, and Abigail Soeder, Senior, Zoology

Mentor: Megan Griffiths, Ph.D.

Dung Beetle Diversity and Species Richness Across Three Habitats in South African Savannah

We examined dung beetle diversity and richness at the Wilfs Rural Facility in Limpopo Province, South Africa. The dung beetle community was assessed in three separate habitats: grassland, woodland, and ecotone. Diversity was measured by collecting one individual of each morphotype at each site the same day the dung was put out, and 24 hours after. Species richness over time was measured by going out to the dung pile locations different times throughout the day.

Janarthanan Ilangovan, Junior, Biology; Abdulaziz Aloliqi, Graduate Student, Biomedical Sciences; and Gail C. Fraizer, Ph.D.

Mentor: Gail C. Fraizer, Ph.D.

Does Cx43 Modulate the Motility of Prostate Cancer Cells

Prostate cancer (PC) is one of the most common male cancers in the United States. PC lethality is due to its ability to metastasize, which is where the cancer cells move from the primary tumor site to a secondary site. We looked at a protein called Connexin 43 (Cx43) which is known to be produced at a higher rate in some prostate cancer cells. Our experiment involved first silencing the production of Cx43 in metastasizing prostate cancer cells then measuring whether the cells’ ability to migrate was affected. We found that inhibiting Cx43 production did reduce migration. The next step is measuring whether increasing Cx43 in non-migratory cells increases their motility. We hope that this will lead to new targeting strategies for PC treatment.

Savannah R. Justus, Senior, Zoology; Oscar Rocha, Ph.D.; Ferenc DeSzalay, Ph.D.; and Emma Given, Graduate Student, Biomedical Sciences

Mentor: Oscar Rocha, Ph.D.

Agricultural Impacts on Aquatic Invertebrate Diversity and Abundance in Costa Rica

Freshwater ecosystems are highly threatened by agricultural practices, which can have an impact on aquatic invertebrate communities. This experiment, conducted at the Alberto Manuel Brenes Biological Reserve in Costa Rica, sampled streams within the reserve, as well as streams within agricultural fields outside of the reserve. Biodiversity and abundance, and indicator score were recorded. Both indicator score (p=0.004) and indicator category (p=0.002) were significantly different between agricultural and non-agricultural streams, indicating that agriculture has a negative impact on water quality. While the diversity was significantly higher in non-agricultural streams (p=0.026), the abundance between treatments was not significant (p=0.321). This suggests that agriculture does influence invertebrate communities by decreasing sensitive or rare taxa, but tolerant taxa that may perform the same function could increase from this.

Shelby Kelemen, Senior, Biology, and Taylor Bumbledare, Junior, Medical Technology

Mentors: Kristy Welshhans, Ph.D. and Leah Kershner, Graduate Student, Biomedical Sciences

Expression of RACK1 and APP is Increased in Human Down Syndrome Fibroblasts

Down syndrome results from the trisomy of human chromosome 21 and is the most prevalent genetic cause of intellectual disability. Because receptor for activated C kinase 1 (RACK1) and amyloid precursor protein (APP) have both been implicated in the pathogenesis of Down syndrome, we hypothesized that their expression may vary in Down syndrome. Fibroblasts were obtained, and RACK1 and APP expression in these fibroblasts were labeled using quantitative immunocytochemistry. Preliminary results demonstrate that both RACK1 and APP are overexpressed in Down syndrome fibroblasts, which may contribute to the pathogenesis of this disorder. In future experiments, we will examine how RACK1 mRNA localization may be dysregulated and the expression in neurons, to further study brain connectivity. These experiments will further advance the understanding of Down syndrome.

Hannah Kennedy, Senior, Biology; Matthew Russ, Sophomore, Biology; and Brett Lowden, Pre-College

Mentors: John Johnson, Ph.D., and Adam Kulp, Graduate Student, Biomedical Sciences

The DREADDs Technique Utilized to Control the Hypothalamus-Pituitary-Adrenal Axis of Rodents

This current work is a mechanistic study to determine whether we are able to activate the paraventricular nucleus (PVN) and ultimately increase rat corticosterone (CORT) levels though designer receptor exclusively activated by designer drugs (DREADD) technology. DREADDs have been used to control cellular activity in both a spatial and temporal manner to successfully analyze neural circuitry previously, and are used in this experiment to induce transcription of cellular receptors to mediate the cell response, allowing control over circulating CORT levels (American College of Neuropsychopharmacology, 2012). It is hypothesized that once the CNO ligand has been injected and binds with the DREADDs, the PVN will be activated and result in an increase of CORT.
Kirsten T. Maricic, Senior, Biology; Amanda C. Klein, Graduate Student, Biomedical Sciences; Ashutosh Rastogi, Ph.D.; and Eric M. Mintz, Ph.D.

Mentor: Ashutosh Rastogi, Ph.D., and Eric Mintz, Ph.D.

Altered Circadian Phenotype in Cannabinoid Receptor 1 Knockout Mice

The suprachiasmatic nucleus of the hypothalamus drives daily rhythms of physiology and behavior. We investigated the role of endocannabinoids in regulating circadian rhythms. Using mice lacking the cannabinoid type 1 receptor (CB1), mice showed a number of behavioral differences from unaltered mice, including circadian disorganization, shorter free-running periods, and increased phase shifts in response to light pulses. After phase advances and delays CB1−/− mice display faster reentrainment rates compared to wild type mice. Mice show normal or increased food anticipatory activity to timed restricted feeding, but no increase in neuronal activation after nocturnal light pulses. These data suggest that cannabinoids play an important role in regulating circadian rhythms.

Nathan Mudrak, Junior, Pre-Medicine/Pre-Osteopathy; Priyanka S. Rana, Graduate Student, Biological Sciences; and Michael A. Model, Ph.D.

Mentor: Michael Model, Ph.D.

Calibrated Brightfield-Based Imaging for Measuring Intracellular Protein Concentration

Intracellular protein concentration is an essential cell characteristic that manifests itself through the refractive index. The latter can be measured from two mutually defocused brightfield images analyzed using the TIE (transport-of-intensity equation). To improve the accuracy of TIE, we have developed a calibration procedure that allows one to directly relate the output of TIE (T) to intracellular protein concentration C (g/l). The resultant relationship has a simple form: C = 1.0(T/V), where V is the cell volume (um^3) and 1.0 is an empirical coefficient. We used calibrated TIE to characterize variations of C during the cell cycle and its recovery in HeLa cells placed in a hyperosmotic solution. We found that C remains elevated during the first 30-60 minutes but fully recovers after 20 hours.

Carlyn Mitchell, Senior, Biology

Mentors: Gavin Svenson, Ph.D., and Nicole Gunter, Ph.D.

Curating and Digitizing the Cleveland Museum of Natural History’s Bumblebee Collection

Purpose: 
Throughout history, museums have curated specimens to document biological heritage. Research using curated specimens has been hindered due to inaccessibility to this resource, though. Because of the demand for data provided through properly curated specimens, this research aimed to identify the Cleveland Museum of Natural History’s bumblebee species, then to digitize this data.

Methods: 
Identification proceeded using dichotomous keys and voucher specimens. Bumblebees that were previously misidentified were also corrected and reorganized. Once identification was completed, digital transcription commenced.

Results: 
Thirty bumblebees that were previously identified were incorrect, necessitating re-identification. 103 undetermined specimens has been hindered due to inaccessibility to this resource, though. Because of the demand for data provided through properly curated specimens, this research aimed to identify the Cleveland Museum of Natural History’s bumblebee species, then to digitize this data.

Implications: 
Identity corroboration produced higher species diversity amongst the museum collection of Bombus. Results also indicate the necessity for identity corroboration to species level.

Nathan Mudrak, Junior, Pre-Medicine/Pre-Osteopathy; Priyanka S. Rana, Graduate Student, Biological Sciences; and Michael A. Model, Ph.D.

Mentor: Michael Model, Ph.D.

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Kati O’Keefe, Senior, Biology; Nirmala Ghimirey, Graduate Student, Biomedical Sciences; Shorog Al Omair, M.S.; and Gail Fraizer, Ph.D.

Mentor: Gail Fraizer, Ph.D.

Mechanisms of Alternative Splicing of Vascular Endothelial Growth Factor in Hypoxia

Serine-arginine-rich (SR) splicing factors are found in the splicesome that carries out the splicing of exons. Kinases including serine arginine rich protein kinases (SRPKs) activate SR splicing factors. SRPK1 functions in splicing vascular endothelial growth factor (VEGF). The aim of this study was to determine if hypoxic conditions could activate SRPK1/SRPK2 in leukemia cells that splice VEGF isoforms. The results have indicated that hypoxia does not change SRPK1/SRPK2 mRNA levels but protein levels need to be examined. Another possible explanation is that other splicing kinases may be responsible for altering the VEGF 121 levels in leukemia cells. A better understanding of the mechanism of splicing of VEGF could lead to new therapy targeting specific isoforms.

Carey Ousley, Junior, Biology, and Matthew Wuensch, Senior, Biology

Mentor: David Ward, Ph.D.

The Impacts of Age and Sex on Behavior in a Territorial Herb of Impalas (Aepyceros melampus)

We analyzed the behavior of two separate impala (Aepyceros melampus) herds in South Africa. We hypothesized that fawns would spend less time being vigilant than the adults and would spend more time in social interactions and foraging. We also hypothesized that the alpha male would spend a greater portion of his time vigilant than the adult females. The two herds were separated by roughly 2 km, and each herd consisted entirely of mothers and fawns with a single alpha male. Random individuals within the herds were selected and their behaviors were recorded from a distance every 15 seconds. Observations on individuals varied in duration from 5-30 minutes. Date, time of day and habitat were also recorded during each observance. Eleven standard behaviors were observed.

Claire Thiele, Senior, Zoology

Mentors: Sean Veney, Ph.D., and Charles Austin Leeds, Graduate Student, Case Western Reserve University

Comparison of Self-Directed and Social Behaviors Amongst a Captive Group of Mandrills (Mandrillus sphinx)

Mandrills (Mandrillus sphinx) utilize self-directed and social behavior, but the function of these behaviors in this species is poorly understood. In this project, the mandrills of the Cleveland Metroparks Zoo were observed to refine comprehension of the social hierarchies amongst a given captive group. Each self-directed and social behavior of the four individuals on exhibit was identified and compared. Hypotheses formed were: (1) males will exhibit more self-directed behaviors than the females; (2) individuals with higher social rank will exhibit less self-directed behaviors; and (3) there will be a higher rate of self-directed behavior post-conflict. Results found that none of these hypotheses could be supported either due to small population size or misconceptions on complex social animal behaviors.
Amber Titus, Senior, Biology; Hailee J.Zendlo, Senior, Biology; Hannah M. Bielski, Senior, Chemistry; Lydia A. Heemstra, Graduate Student, Biological Sciences; Chaitanya K. Gavini, Ph.D.; and Colleen M. Novak, Ph.D.

Examining the Effects of Road Salt Usage on Pond Snails

Mentors: Lydia A. Heemstra, Graduate Student, Biological Sciences; Chaitanya K. Gavini, Ph.D.; and Colleen M. Novak, Ph.D.

The use of salt to increase safety on roads and sidewalks has been shown to negatively affect aquatic macroinvertebrates when dissociated chloride ions enter waterways as run-off. This can have serious consequences for freshwater ecosystems, as macroinvertebrate communities are responsible for critical ecosystem processes. This study identified how road salting affected the salinity of five freshwater ecosystems at Kent State University as well as how pond snail growth and survival were affected by the chloride concentrations of these systems. Ion chromatography and a conductivity meter were used to measure ion concentrations in each ecosystem. Individual snails were introduced to the water samples, and growth and survivorship were monitored for several weeks. Preliminary data indicate that road salting is correlated to increased chloride concentrations within Kent waterways.

Allison Zahorec, Senior, Zoology

Mentor: David Costello, Ph.D.

Obesity is a major health risk that can lead to numerous complications like heart disease and type 2 diabetes. In order to promote weight loss, thermogenic mechanisms were examined to burn caloric energy as heat in skeletal muscle, a novel approach. We investigated the expression of the muscle protein, sarcolipin, to determine its potential as a modulator of centrally-induced thermogenesis within skeletal muscle. Quantitative PCR was used to compare gastrocnemius muscle sarcolipin expression between control rats and rats with centrally induced thermogenesis (using melanotan II). There was significantly higher muscle sarcolipin mRNA expression in rats that received melanotan II, implicating muscle sarcolipin as a driver of brain-melancortin-induced thermogenesis. Activating this thermogenic mechanism in skeletal muscle may be effective in combating obesity.

Chanelle D. Waligura, Sophomore, Biology

Mentors: Olencia Piontkivska, Ph.D., and Mary Saha Halpin, Graduate Student, Biological Sciences

Gastrocnemius muscle sarcolipin expression between eccentric and concentric resistance exercise. Subjects completed a concentric and eccentric full-body resistance workout. Mean arterial pressure, pulse wave velocity, heart rate and blood lactate were assessed at six different timepoints (pre through 120 minutes of recovery). The data indicates that metabolically demanding concentric exercises result in greater post exercise hypotension and reduced vessel stiffness. These results have exercise prescription implications for those with hypertension or autonomic dysfunction.

Samantha A. Bailey, Senior, Biology

Mentors: Kristy Welshhans, Ph.D.; Shruti Jain, Ph.D.; and Leah Kershner, Graduate Student, Biological Sciences

Generating Induced Neurons from Human Down Syndrome Fibroblasts by Direct Reprogramming

Down syndrome is a complex developmental disorder that results from the triplication of human chromosome 21. Here, we used direct reprogramming to convert human fibroblasts into induced neurons and create a human model of this disorder. We introduced four transcription factors into human Down syndrome fibroblasts and a healthy control via lentiviral mediated gene transfer. We found that Down syndrome fibroblasts can be converted into induced neurons and are in the process of confirming this using neuronal-specific markers. This is a novel discovery, as it was not previously known if Down syndrome fibroblasts could successfully be converted to neurons using direct reprogramming. We will now use this model to gain a better understanding into Down syndrome, as well as insight into treatments for this disorder.
Bert Crawford, Senior, Biology  
Mentor: P. Bagavandoss, Ph.D.  
Effect of Phytocannabinoids and Endocannabinoids on Ovarian Cancer Cell Proliferation  

The phytocannabinoids tetrahydrocannabinol (THC) and cannabidiol (CBD) and the endocannabinoids anandamide (AEA) and 2-arachidonoylglyceryl (2-AG) exhibit antiproliferative effects on cancer cells derived from multiple organs, including thyroid, brain, prostate and breast. Therefore, I hypothesized that ovarian cancer cell proliferation will be also inhibited by these cannabinoids. Subconfluent SKOV3 ovarian cancer cells were incubated with the above cannabinoids in serum-free medium for two days. Subsequently, both qualitative and quantitative methods were used to determine the effects of these compounds on the cells. THC and CBD and R-1 methylamandamide (MEA), a metabolically stable analog of anandamide, inhibited cell proliferation and induced rounding and detachment of the cells. 2-AG, however, exhibited no antiproliferative effect. The differential effects of cannabinoids on SKOV3 cell proliferation partly support my hypothesis.

Richard M. Cukelj, Senior, Biology; Elda Hegmann, Ph.D.; Ernest Freeman, Ph.D.; Jennifer McDonough, Ph.D.; and Robert Clements, Ph.D.  
Mentors: Elda Hegmann, Ph.D.; Ernest Freeman, Ph.D.; Jennifer McDonough, Ph.D.; and Robert Clements, Ph.D.  
Use of Porous Elastomer Foams to Support Long-Term Three Dimensional Neuronal Cultures  

In order to effectively study the interactions that occur between neurons over an extended period of time and spatially in the brain, it is necessary to have reliable, repeatable studies. This is difficult with two-dimensional cell culture techniques. Here we present a platform to study neuronal networks for extended periods in vitro using three-dimensional (3D) elastomer foams. Elastomer foams were constructed with pore sizes ranging from 150μm to 400μm with 40μm secondary pores which allowed human neuroblastoma cells (SH-SY5Y) to adhere and interact with the foam and be sustained for long term studies, over 60 days. Being able to sustain neurons for this long in 3D arrangements allows for a better representation of 3D tissues, making this method applicable for studying neurodegenerative disease states.

Mitchell Anthony Filka, Senior, Biotechnology  
Mentor: Min-Ho Kim, Ph.D.  
Antimicrobial Susceptibility Patterns of S. Aureus Biofilms  

Staphylococcus Aureus is currently one of the leading causes of infections in diabetic patients and a major cause of chronic wounds. Staphylococcus Aureus is also a common nosocomial infection as it is an opportunistic pathogen that can live in wounds. Staphylococcus Aureus is also a common nosocomial infection as it is an opportunistic pathogen that can live in wounds. Staphylococcus Aureus is currently one of the leading causes of infections in diabetic patients and a major cause of chronic wounds. Staphylococcus Aureus is also a common nosocomial infection as it is an opportunistic pathogen that can live in wounds. Staphylococcus Aureus is currently one of the leading causes of infections in diabetic patients and a major cause of chronic wounds. Staphylococcus Aureus is also a common nosocomial infection as it is an opportunistic pathogen that can live in wounds. Staphylococcus Aureus is currently one of the leading causes of infections in diabetic patients and a major cause of chronic wounds. Staphylococcus Aureus is also a common nosocomial infection as it is an opportunistic pathogen that can live in wounds. Staphylococcus Aureus is currently one of the leading causes of infections in diabetic patients and a major cause of chronic wounds. Staphylococcus Aureus is also a common nosocomial infection as it is an opportunistic pathogen that can live in wounds. Staphylococcus Aureus is currently one of the leading causes of infections in diabetic patients and a major cause of chronic wounds. Staphylococcus Aureus is also a common nosocomial infection as it is an opportunistic pathogen that can live in wounds.

Olivia Gilmour, Senior, Exercise Science; Yu Lun Tai, Graduate Student, Exercise Physiology; Erica Marshall, Graduate Student, Exercise Physiology; Alaina Glasgow, Senior, Exercise Science; and J. Derek Kingsley, Ph.D.  
Mentor: J. Derek Kingsley, Ph.D.  
Autonomic Modulation After an Acute Bout of Bench Press With and Without Blood Flow Restriction  

The purpose of the present study was to evaluate autonomic modulation after bench press with and without blood flow restriction (BFR). Sixteen men had their autonomic modulation assessed at rest, 15 (Rec1), and 25 (Rec2) minutes after three different conditions: low-intensity exercise with BFR (LI-BFR), high-intensity exercise (HI), and a control (CON). Autonomic modulation consisted of vagal tone, sympathetic modulation and sympathovagal balance. There was a significant condition by time interaction for vagal tone such that it was reduced at Rec1 and Rec2 compared to Rest and CON. There was a main effect of time for sympathovagal balance such that it was increased at Rec1 and Rec2 compared to Rest. These data suggest that LI-BFR and HI similarly alter autonomic modulation.

Alaina Glasgow, Senior, Exercise Science; Erica Marshall, Graduate Student, Exercise Physiology; Yu Lun Tai, Graduate Student, Exercise Physiology; and J. Derek Kingsley, Ph.D.  
Mentor: J. Derek Kingsley, Ph.D.  
Acute Resistance Exercise Effects on Autonomic Modulation in Resistance-Trained Men and Women  

The purpose of the present study was to evaluate sex-specific responses to an acute bout of resistance exercise (RE) on autonomic modulation. Twenty-three resistance-trained men (n=13) and women (n=10) volunteered for the study. Autonomic modulation was assessed at rest, as well as 15-20 minutes (Rec1) and 25-30 minutes (Rec2) after acute RE. Assessment of autonomic modulation included measures of vagal tone and sympathetic modulation, as well as sympathovagal balance. The sexes were similar at rest. Compared with rest, sympathetic modulation and sympathovagal balance were augmented at Rec1 and Rec2. Vagal tone was decreased at Rec1 and Rec2 compared to Rest after the acute RE. Our data suggest that acute RE using free weights has a profound impact on autonomic modulation that is similar between the sexes.

Sierra Glass, Junior, Chemistry; Lori Showalter, Ph.D.; and Gary Koski, Ph.D.  
Mentors: Gary Koski, Ph.D., and Lori Showalter, Ph.D.  
A New Immunological Treatment of Prostate Cancer Using an Apoptotic Enhancement Therapy Drug, Alisertib  

Early breast cancer vaccine therapy may be mediated, in part, through the action of T cell-secreted cytokines Interferon-gamma (IFN-) and Tumor necrosis factor alpha (TNF-) We then sought to determine if three types of prostate cancers (LnCap, PC3, and DU145) showed similar susceptibility to these cytokines and if the addition of the apoptosis-enhancing agent, Alisertib, would further enhance these effects. There was impaired metabolic activity, fewer viable cells and apoptotic cell death induced by cytokines with Alisertib, as compared to cytokines alone. These studies indicate that vaccines stimulating production of cytokines may be effective for prostate cancer, and are enhanced by Alisertib.

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Kristen Harris, Senior, Biology, and Takhar Kasumov, Ph.D.
Mentor: Takhar Kasumov, Ph.D.

**HDl Protein Turnover as a Link Between Cardiac Disease and Diabetes**

The vascular complications following hyperglycemia and hyperlipidemia are detrimental to individuals that suffer from diabetes mellitus as it accelerates atherosclerosis of the coronary arteries, and the fibrosis of the myocardium. Hyperglycemia causes abnormalities in insulin action and secretion as well as has an effect on biochemical pathways. This leads to alterations of signal transduction pathways and protein function. Changes in the function of lipoprotein metabolism due to glycation, is one of the main issues increasing the risk for developing atherosclerosis. The purpose of this study is to understand why diabetes contributes to cardiac disease. This study helps to prove the hypothesis that the stability of HDL-proteins is smaller and their synthesis rates much faster in hyperglycemic conditions.

**Erik Hopkins, Junior, Biology; Spencer R. Andrei, Graduate Student, Biomedical Sciences; Manasi A. Agrawal, Graduate Student, Biomedical Sciences; Monica Ghosh, Graduate Student, Biomedical Sciences; and Derek Damron, Ph.D.**

**Intermittent Fasting Induces Weight Loss Preferentially in Obesity-Prone Rats**

**Methods:** Body weight was measured (high-capacity runners) and obesity (low-capacity runners) following a model of leanness of limited food access are alternated with days of normal food availability. We employed a rat model of leanness to fight obesity is intermittent fasting, where days without food (10 minutes) are separated by days of normal eating. In contrast, days of fasting and obesity (low-capacity runners) are separated by days of normal eating. This alternating pattern was continued for 4 weeks. We found that intermittent fasting led to weight loss in both males and females. The loss of weight was statistically significant in the high-capacity runners compared to the low-capacity runners. These results suggest that intermittent fasting is an effective method to fight obesity.

**Alex Mervar, Sophomore, Exercise Science; Alaina Glasgow, Senior, Exercise Science; Erica Marshall, Graduate Student, Exercise Science; Yu Lun Tai, Graduate Student, Exercise Science; and J. Derek Kingsley, Ph. D.**

**Sex-Specific Differences in Pulse Wave Reflection and Arterial Stiffness After Resistance Exercise**

**Problem:** No studies have evaluated sex-specific vascular responses to an acute bout of resistance exercise (RE).

**Methods:** Vascular function was assessed at rest and 10 minutes after an acute bout of RE in resistance-trained men (n=14) and women (n=12). A mixed ANOVA was used to analyze the effects of sex (men, women) across condition (acute exercise resistance, control) and time (rest, recovery).

**Results:** The sexes had similar values across time and condition. There was no effect of the RE on blood pressures. There were significant condition x time interactions for pulse wave reflection and aortic arterial stiffness such that they were increased post-exercise. CONCLUSIONS: These data suggest that an acute bout of RE significantly alters vascular function similarity for both sexes without altering aortic hemodynamics.

**Cyrus Mirhaidari, Junior, Pre-Medicine/Pre-Osteopathy; Min-Ho Kim, Ph.D.; and Andrew Bayes, Senior, Chemistry**

**Mentor: Min-Ho Kim, Ph.D.**

**In Vitro Model of Polymicrobial Biofilm Consisting of Both S. Aureus and P. Aeruginosa**

**Pseudomonas aeruginosa and Staphylococcus aureus are the two most common causes of chronic wound infections and are frequently found together. Studies suggest that P. aeruginosa and S. aureus infect simultaneously, resulting in worse outcomes than infection by single species bacteria alone. P. aeruginosa has shown to quickly kill S. aureus when the two are grown together in planktonic co-cultures in vitro, making it difficult to develop an appropriate model closely reflecting polymicrobial infection in human chronic wound. The objective of this study is to establish an in vitro model for polymicrobial biofilms consisting of both S. aureus and P. aeruginosa. This was achieved by inoculating them at different ratios and determining the optimal condition that results in growth of both bacteria.**

**Andrew Paliobeis, Senior, Chemistry; John Grizzanti, Graduate Student, Biomedical Sciences; Sara Patrick, Graduate Student, Biomedical Sciences; and Gemma Casadesus, Ph.D.**

**Mentor: Gemma Casadesus, Ph.D.**

**Peptide Hormone Amylin Reduces Oxidative Stress Through Improved Mitochondrial Dynamics**

**Oxidative stress has been shown to be a key pathological feature of neurodegenerative diseases including Alzheimer’s disease (AD). Previous work in our laboratory has demonstrated that administration of the peptide hormone amylin can reduce levels of oxidative stress in mouse and neuronal cell models of AD (APP/PS1 and Neuroscreen-1 cultures). Although it is apparent that amylin has antioxidant activity, its mechanism of action remains unclear. Because mitochondria are the main contributors to oxidative stress in a cell, they have been a target of our investigation. We have found that amylin treatment regulates mitochondrial dynamics-associated proteins as well as proteins associated with mitochondrial biogenesis. Taken together, our data suggest that some of the effects of amylin on oxidative stress regulation may stem from improving mitochondrial function.**
Austin D. Parker, Senior, Biology; David F. Barnard, Graduate Student, Biological Sciences; and John D. Johnson, Ph.D.

Mentors: David F. Barnard, Graduate Student, Biological Sciences; and John D. Johnson, Ph.D.

The Effect of Repeated Stress Exposure on Microglial Phagocytosis

Our lab has previously shown that exposure to chronic stress induces anhedonic behavioral responses in Fischer 344 rats after a four-day chronic mild stress paradigm (Camp et al). To examine the activation state of microglia after this chronic mild stress protocol, microglia were isolated from the hippocampus and placed in culture to measure pro-inflammatory cytokines and phagocytic capacity. Following 4h in culture basal IL-1, TNF-alpha, and IL-6 protein production were not altered in microglia collected from stressed or control group animals. After LPS stimulation, IL-1 production was attenuated in microglia collected from stressed animals while no changes were observed in the production of TNF-alpha or IL-6. Further studies are required to uncover the effects of stress on microglial phagocytosis.

Ryan Pasquino, Senior, Biology; Spencer Andrei, Graduate Student, Biomedical Sciences; Manasi Agrawal, Graduate Student, Biomedical Sciences; and Derek Damron, Ph.D.

Mentor: Derek Damron, Ph.D.

TRPA1 Activation Elicits Post-Translational Modifications of Akt and eNOS in Cardiomyocytes

The extent to which TRPA1 mediates signaling events in cardiac tissue has yet to be fully determined. Based upon investigations completed in other tissue types in the body, we hypothesized that TRPA1 activation will lead to Akt and eNOS activation in CMs. Wild-type CMs treated with TRPA1 agonist, AITC, demonstrated a significant increase in phosphorylated Akt and eNOS compared to the untreated control. These effects were absent in CMs obtained from TRPA1 null mice. Furthermore, CMs pretreated with LY294002 before AITC addition demonstrated a significant lowering of pNOS-S1177; whereas pretreatment of CMs with L-NAME had no effect on the AITC-induced increase in p Akt-S473 levels. We identify a novel signaling cascade in adult mouse cardiomyocytes whereby TRPA1 stimulation elicits Akt phosphorylation followed by eNOS phosphorylation.

Madison Shindorf, Senior, Pre-Medicine/Pre Osteopathy; Spencer Andrei, Graduate Student, Biomedical Sciences; Derek Damron, Ph.D.; Manasi Agrawal, Graduate Student, Biomedical Sciences; and Monica Ghosh, Graduate Student, Biomedical Sciences

Mentors: Derek Damron, Ph.D.; Spencer Andrei, Graduate Student, Biomedical Sciences; Monica Ghosh, Graduate Student, Biomedical Sciences; and Manasi Agrawal, Biomedical Sciences

Analyzing Essential Oils Extracted From Ferula iliensis – Novel TRP Channel Modulators?

We investigated seven different essential oils (EO) extracted from Ferula iliensis that stimulate calcium influx through transient receptor potential channel of the vanilloid subtype 1 (TRPV1)-transfected human embryonic kidney (HEK) cells. The current data show several EO’s stimulating calcium influx; however, two compounds, trans-2-nonenal and geranylacetone acted directly through TRPV1. Calcium assay measurements demonstrated that the two EO’s induced calcium influxes into TRPV1-transfected HEK cells. Real-time calcium measurement results were observed where transient increases in intracellular-free calcium concentrations in TRPV1-transfected HEK cells occurred. These effects were diminished in the presence of TRPV1 inhibitor peptide, SB366791, suggesting that trans-2-nonenal and geranylacetone are selective activators of TRPV1. Future investigations will be required to elucidate the intracellular signaling cascades elicited via this TRPV1 stimulation in the heart.

Katya Sracic, Senior, Biology; Jeffrey A. Blair, Graduate Student, Biomedical Sciences; Sabina Bhatta, Graduate Student, Biomedical Sciences; and Gemma Casadesus, Ph.D.

Mentor: Gemma Casadesus, Ph.D.

Luteinizing Hormone and Markers of Neural Plasticity During the Mouse Estrous Cycle

Luteinizing hormone (LH) plays an important role in learning and memory. Previously, our laboratory demonstrated an inverse relationship between blood and brain levels of LH and when normalized post-ovariectomy, both cognition and spine density losses are reversed. To address this reproductive status dependent change, we determined whether normal cyclic fluctuations in LH during the estrous cycle correlate with neuronal markers of neuroplasticity, synaptophysin and spinothin, in cognition-associated brain regions. As expected, preliminary data suggest that LH levels fluctuate during the estrous cycle and may correlate with synaptic markers associated with cognitive function. Given that others have found that cognition function fluctuates during the estrous cycle, our data demonstrate that these fluctuations may be at least, in part, dependent on changes in serum and brain LH.
Cocaine use creates a long-term lengthening of circadian period (tau), possibly underlying health issues of addiction. Additionally, rewarding effects of paternal cocaine are transgenerational. We hypothesize that cocaine's tau lengthening effect may also be inherited. Male mice exposed to forced cocaine-water or water were harem-mated with cocaine naïve females. Offspring were phenotyped for drug preference and circadian behaviors. Striatum RNA was isolated from F1 males and analysed with HiSeq RNA analysis. Lengthening of tau was evident in cocaine sires. Circadian behaviors were not altered in the F1’s, but CocSire Males had a decreased preference for cocaine. RNAseq analysis revealed a correlation between genes upregulated in CocSire Males and in the expression CREB and short-term ΔFosB. These data reveal a paternal effect on cocaine reward mechanisms.

**Transgenerational Epigenetic Effect of Cocaine on Circadian Behavior and Cocaine Reward**

**Robert W. Woodruff III, Senior, Biology; Leann Ray, Sophomore, Biology; John David Glass, Ph.D.; and AlexandraYaw, Graduate Student, Biomedical Sciences**

**Mentors:** John David Glass, Ph.D., and Alexandra Yaw, Graduate Student, Biomedical Sciences

**Exercise Science; Samantha M. Anderson, Senior, Exercise Science; Jonathon Stavres, Graduate Student, Exercise Physiology; Amber Finnin, Senior, Exercise Science; Kelly Taylor, Senior, Exercise Science; and John McDaniel, Ph.D.**

**Mentors:** John McDaniel, Ph.D., and Stephen Fischer, Graduate Student, Exercise Physiology

**Metabolic and Cardiovascular Differences Between an Eccentric, Concentric, and Traditional Resistance Exercise Training Session**

The reduced metabolic cost of isolated eccentric contractions compared to concentric contractions is well-established. However, the net impact of this difference across an entire session of resistance exercise has not been determined. Thus, the purpose of this investigation was to determine the extent to which metabolic and cardiovascular stress varied between training sessions comprised only of eccentric, concentric or traditional resistance exercises. Subjects completed a traditional, concentric and eccentric full-body resistance workout. Oxygen consumption, respiratory exchange ratio, heart rate, mean arterial pressure, and blood lactate were recorded throughout the exercise sessions. These results indicated that, despite similar mechanical work, the metabolic and cardiovascular demand across resistance training is greater when that session is comprised of only traditional or concentric exercise compared to eccentric exercises.

**Metabolic and Cardiovascular Differences Between an Eccentric, Concentric, and Traditional Resistance Exercise Training Session**

**Robert W. Woodruff III, Senior, Biology; Leann Ray, Sophomore, Biology; John David Glass, Ph.D.; and Alexandra Yaw, Graduate Student, Biomedical Sciences**

**Mentors:** John David Glass, Ph.D., and Alexandra Yaw, Graduate Student, Biomedical Sciences

**Transgenerational Epigenetic Effect of Cocaine on Circadian Behavior and Cocaine Reward**

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**Transgenerational Epigenetic Effect of Cocaine on Circadian Behavior and Cocaine Reward**

**Robert W. Woodruff III, Senior, Biology; Leann Ray, Sophomore, Biology; John David Glass, Ph.D.; and Alexandra Yaw, Graduate Student, Biomedical Sciences**

**Mentors:** John David Glass, Ph.D., and Alexandra Yaw, Graduate Student, Biomedical Sciences

**Design, Fabrication and Demonstration of a Computer Numerically Controlled Rapid Prototyping Machine for Additive Manufacturing, CNC Machining and Laser Cutting**

CNC can be applied to a variety of manufacturing processes, including chip forming cutting operations - also called subtractive manufacturing such as milling, turning or drilling, 3D printing - also called additive manufacturing (a form of rapid prototyping), or laser cutting. The common operating feature of all CNC applications is the automated control of the tool (cutter, extruder, laser, etc.) movement relative to the workpiece that is fabricated.

As a consequence, most CNC machines share similar features that include a stage (table) supporting the workpiece that can move along two or three piggybacked axes using drive trains and a tool support that can move along one or more axes. The motion of the tool and workpiece are controlled by stepper motors or servomotors connected to the leadscrews or pulleys through coupling mechanisms.

**COMPUTER SCIENCE/MATHEMATICS – POSTER**

**Design, Fabrication and Demonstration of a Computer Numerically Controlled Rapid Prototyping Machine for Additive Manufacturing, CNC Machining and Laser Cutting**

**Mentor:** Vladimir Gurau, Ph.D., P.E.

**Mentor:** Fayez F. Safadi, Ph.D.

**The Therapeutic Effect of GPNMB/Osteoactivin in a Traumatically Induced Osteoarthritic Mouse Model**

Osteoarthritis is a severe joint disease that affects millions of people. At this time, the current treatment for osteoarthritis is total joint reconstruction surgery. GPNMB/Osteoactivin plays a key role in bone remodeling and bone growth. Data from our lab suggested that GPNMB/Osteoactivin is a positive regulator of osteoblastogenesis and a negative regulator of osteoclastogenesis. Furthermore, the role of GPNMB/Osteoactivin in cartilage has not been investigated before. Based on preliminary studies performed in our lab, we expect cartilage degeneration to be dramatically decreased in response to the therapeutic effects of GPNMB/Osteoactivin. A protective factor against osteoarthritis progression, osteoactivin injected mice should have remarkably better articular cartilage in comparison to the control group, proving GPNMB/Osteoactivin a promising therapy in lieu of total joint reconstruction.

**ORAL**

**The Therapeutic Effect of GPNMB/Osteoactivin in a Traumatically Induced Osteoarthritic Mouse Model**

**Mentor:** Fayez F. Safadi, Ph.D.

**Bryson P. Cook, Senior, Integrated Life Sciences; Asaad Al-Adlaan, Graduate Student, Biomedical Sciences; and Fayez F. Safadi, Ph.D.**

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**The Therapeutic Effect of GPNMB/Osteoactivin in a Traumatically Induced Osteoarthritic Mouse Model**

**Mentor:** Fayez F. Safadi, Ph.D.
Derek Ellinger, Sophomore, Engineering Technology; James Keyser, Senior, Electrical Engineering Technology; Cody Langenfeld, Junior, Engineering Technology; and Robert Menarcheck, Sophomore, Electrical Engineering Technology
Mentor: Vladimir Gurau, Ph.D., P.E.
Hybrid Unmanned Aircraft System

In the first two phases of the project, the HT-PEMFC and the methanol reformer, the octocopter, the gimbal for video acquisition system and the FPV system have been designed and built. In the current phase, we will integrate the flight control system, will calibrate the sensors for stabilized and automated flight control (sensor for global navigation satellite system, electronic compass, altimeter/range finder and accelerometer / gyroscope), will program flight modes, will integrate the video acquisition and FPV system and will test the system in various flight modes. In a future phase, the HT-PEMFC and the methanol reformer will be integrated to the UAS to secure increased flight autonomy.

Donald W. Fincher Jr., Senior, Mathematics
Mentor: Mahmoud Najafi, Ph.D.

In this research, we are pursuing the robustness of a self-excited vibrational system with negative damping. In practice, this is manifested as conductor galloping of overhead power lines, which is an oscillation of the lines caused by strong winds. Improved transmission tower designs are needed which are capable of combating excessive stresses exerted on the tower by the galloping power lines. Our model of this self-excited system shows that the oscillations can be controlled by adding a boundary velocity feedback controller at the transmission tower. Using a decomposition method, we show there is a closed form analytical solution which predicts the system can be stabilized under certain conditions. Through this research, power transmission systems that are more reliable and resistant to galloping can be engineered.

Paul J. Leyden, Junior, Computer Science
Mentor: Jonathan Maletic, Ph.D.
Translation of a Text-Based UML Class Diagram Representation Into a Graphical Rendering Language

The goal of the research is to discover and create a means to convert a text representation of UML diagrams (yUML) to the dot language used by Graphviz. Programmers can then easily create and display the design of the software system in an easy-to-follow UML class diagram to enhance the understanding. The research is realized as a software tool that takes yUML as input and generates the dot representation. The results of this research allow the ability to recover a visual UML class diagram for any given software system. The resulting tool will be an effective and useful addition to the srcML library of tools for programmers to use in understanding large code systems.
Ray Thompson, Junior, Engineering Technology  
**Mentor:** Vladimir Gurau, Ph.D., P.E.  
**Title:** Autonomous Robotic Lawn Mower Guided by Global Navigation Satellite System

The objective of the proposed research is to investigate, design and demonstrate a robotic lawn mower that uses GNSS and electronic compass as sensors for autopilot. The autopilot will allow the mower to navigate along a predetermined trajectory between waypoints, replacing thus the uneconomical random motion of the prior-art robotic mowers. The autopilot / controller will be based on ArduPilot platform. The software upload, the configuration of the controller, the calibration of the sensors and the definition of the autopilot trajectory will be achieved using the freeware graphical user interface (GUI) Mission Planner. The trajectory of the mower will be defined in Mission Planner using waypoints on a satellite map of the lawn.

Alyssa Flower, Senior, Speech Pathology and Audiology  
**Mentor:** Anna Schmidt, Ph.D.  
**Title:** Insertion of Glottal Stops Before Word-Final Voiceless Stops in English

Limited research has been conducted on the occurrence of glottal stops, a vocal phenomenon that creates a “creaky voice quality,” in American English (Pierrehumbert, 1995, p. 39). The current study focuses on finding the most facilitative contexts for the insertion of glottal stops for final voiceless stops /p t k/ in English in Northeast Ohio. Data was collected by recording participants reading 24 different sentences containing /p t k/. The targets were analyzed acoustically and auditorily to determine whether a glottal stop or a different realization was produced. The results suggested that word-final /t/ preceding a fricative or preceding a stressed syllable were the most facilitative contexts for glottal stop insertion. No facilitative contexts were found for /p k/.

Vlas Zyrianov, Freshman, Computer Science  
**Mentor:** Jonathan I. Maletic, Ph.D., and Christian Newman, Graduate Student, Computer Science  
**Title:** A Scalable Approach for Lightweight Pointer Analysis

A lightweight, flow-insensitive pointer analysis tool called srcPtr is presented. The research investigates various methods for pointer analysis to determine which are scalable to large-scale software systems. Pointers are variables that indirectly reference other variables within a source code program. Pointer analysis is a non-trivial activity for determining which variables are being pointed by which pointer and how these indirect references can alter program behavior. A prototype tool is being constructed. The research involves the implementation of various published algorithmic aspects of pointer analysis and determine, via experimentation, which can be accomplished within the parameters of scalability. Once completed, the approach will be one of the only stand-alone, open-source pointer-analysis tool available.
Elizabeth Garlinger, Senior, Communication Studies/Applied Communication  
Mentor: Nichole L. Egbert, Ph.D.  
Crossing Divides: Health, Communication and End of Life

This literature review explores a series of palliative and hospice care-related studies, which highlight effective practices and potential barriers within cross-cultural communication among patients, families and medical staff. Translating from “medical world” to “real world” is often a major barrier in successful caregiving; however, this complexity is substantially increased due to insufficient cultural competencies. The specialized analysis will be conducted in regard to the context of cancer or oncology patient care. Theoretical frameworks, evidence-based training, and thematic insights will be the foundation of proposed future research initiatives.

Samuel Hersh, Junior, English  
Mentor: Kevin Floyd, Ph.D.  
Manhood and War Making: The Literary Response to the Radicalization of Masculinity for the Purposes of WWI Propaganda

In the years leading up to WWI, masculinity underwent large cultural changes in Western Europe and America. Victorian standards of masculinity fell by 1895 from social control, enabling the new century’s code of manhood to rise— one based on heartiness and physical power. This new sense of manhood was later radicalized by countries for use in their propaganda, luring young men into enlisting. Subsequently, manhood was later radicalized by countries for use in their propaganda, luring young men into enlisting. Subsequently, a group of antiwar literature arose to deal with the betrayal of men who fell after the war. Through the use of historicism, critical theory, and literary analysis, I argue that America’s Johnny Got His Gun, Germany’s All Quiet on the Western Front, and the war poetry of Britain’s Wilfred Owen and Siegfried are all literary pieces of social dissent against martial hypermasculinity.

Abbey Matye, Senior, Theatre Studies and Joe Pine, Senior, American Sign Language  
Mentor: Larry Nehring, M.S. Ed.  
Signs of Love

Last semester when I started learning American Sign Language, I realized that my school infrequently provides opportunities for D/deaf students on campus to experience or be involved in our productions. After investigating, I learned that the lack of participation stems from a lack of access. The project I have put together as a first step in solving this is Signs of Love: A Cabaret, a concert performed in ASL while simultaneously being sung in English. This project functions as a means of outreach to the Deaf community with the purpose of laying the groundwork for creating an interactive space where D/deaf individuals can voice their issues and tell their stories. Signs of Love will be performed in such a way that individuals who are D/deaf or Hard of Hearing will be able to experience the production in the same way. Signs of Love will bring students, faculty, and the community together in a way that has not been done before, and will serve as a stepping stone to our art not only being more accessible to a wider audience, but more inclusive to those who want to be involved.

ORAL

Lesley Teater, Senior, Video Communication and Design  
Mentor: Gretchen Rinnert, MGD  
Cursive Camp

Cursive handwriting is no longer a required course in school curricula. For a child’s quickly developing mind, cursive handwriting aids in expanding reading and writing comprehension while also improving cognitive thinking, focus, motor skills and creativity. Cursive Camp is a two-part learning app. The “practice” section allows children to learn how to form each letter and word at their own pace. The “play” section incorporates a curriculum to create a more competitive and engaging atmosphere. It is designed to improve children’s memory, recall and letter recognition. While developing and designing Cursive Camp, I integrated kinesthetic learning techniques to keep the user engaged. I put emphasis on interaction instead of instruction, and created illustrative, animated features to immerse the user in a fun-filled learning experience.

Michael Burkey, Senior, Geology  
Mentor: David Singer, Ph.D.  
XRD and SEM Analysis of the Thermal Transformation of Iron Oxides

Abandoned coalmines around America are still impacting the environment as they discharge contaminated waters into local environments. This is referred to as acid mine drainage (AMD), and it results in highly acidified and heavy metal contaminated waters. Along the beds of the streams running through these areas impacted by coalmining, is a bright orange sediment composed of poorly crystalline iron oxides. These sediments can be filtered, dried, and baked to form a color agent with varying shades of pigments. Through the analysis of the mineral transformations of these AMD sediments with X-ray powder diffraction and scanning electron microscopy, we can better understand the mineralogical and geochemical transformation of the iron oxides in AMD sediments.

Konstantinos Kasamias, Junior, Geology  
Mentor, Chris Rowan, Ph.D.  
Recreation of Newly Discovered Massive Landslide in Utah Using an Analogue Sandbox Model

Recent mapping in SW Utah frontier has revealed one of the largest landslides ever found, extending over 3,400 km2. Although this slide appears to be related uplift associated with volcanic activity in the region 21-22 million years ago, the low angle of slope at which the large mass movement was triggered is difficult to explain. The leading hypothesis is that it is related to low-friction on the slip surface, due to plate collision, which is in a weak, clay unit. For the purpose of this experiment, an analogue landslide model was created, consisting of a thin 1 inch sand layer on a slowly tilting board, with acetate representing the low-friction slip surface. Further experiments are required to understand the factors that best reproduce Markagunt gravity slide.

VIDEO

GEOGRAPHY/GEOLoGY – POSTER

Accessibility options

45
In the black community, a dollar leaves every six hours. In comparison to other ethnic groups, the circulation of revenue in the black community is the shortest. The ability to retain money within the community will give blacks the power to enhance their living conditions, without outside help. Nowadays, you see vacant buildings, roads filled with crater size potholes, businesses outsourced to non-blacks, and unity avoided. This research will evaluate the factors hindering another successful community like Black Wall Street from resurrecting.

Matthew Stiller, Senior, Geography, and V. Kelly Turner, Ph.D.
Mentor: V. Kelly Turner, Ph.D.
Homeowner’s Associations Increasingly Regulate Residential Landscape Ecology in Phoenix, Arizona

This study identifies the location of HOAs and examines content of landscaping regulation documents to determine how HOAs influence residential ecology. We found that, HOAs constituted approximately 40 percent of the subdivisions in our sample and frequently regulated pets, landscape structure, water resources and albedos.

Octavious Singleton, Senior, Business; Christina McVay; and Alene Barnes, Ph.D.
Mentor: Christina McVay
Can the Success of Black Wall Street Be Recreated and Sustained in Black Communities Today?

Helen Clark, Senior, Fashion Merchandising, and Gargi Bhaduri, Ph.D.
Mentor: Gargi Bhaduri, Ph.D.
A Call for Responsible Labor Practices in the Apparel Industry Through Improved Standardized Labor Policies

Knowledge of product origin is an essential element of consumer social responsibility, as the apparel industry is often condemned for unfair labor practices. This study investigates labor laws affecting apparel workers during the manufacturing of US imported apparel. The research question is: What are differences and similarities between U.S. labor laws, and those of its major exporter countries as well as related international laws? A content analysis investigates laws and regulations, indicating labor laws vary significantly across the countries and international platforms, affecting labor workers differently. A consistent labor standard should be further established on a national and global scale.

Nicole Hamischer, Junior, English
Mentor: M. Karen Powers, Ph.D.
Colossus, Raise Your Lamp: Reclaiming Our Diversity Through Immigration

Each American is part of a unique tradition that invites people from all parts of the globe to come here, seek their fortune, find happiness and give their families a fresh start: essentially, embody the American Dream. Those who dare to come here today through legal channels face an overcomplicated, expensive process that takes years to navigate. Many take the only option they have: entering the country illegally.

As immigration takes center stage, the political climate surrounding it has become outright hostile with the election of President Trump. We need to find a solution that allows those here to become part of the culture they help build and support. Finding a solution that provides opportunities for those seeking them, while maintaining possibilities for the current citizenry is imperative to our country’s future.

Kathleen Moorman, Senior, Political Science
Mentor: Julie Mazzei, Ph.D.
"Draw a President": An Analysis of Children’s Images of the Presidency and How They Affect Women in Politics

The lack of female representation in the political sphere is an undeniable issue of concern in America, and may be partially traced to established stereotypes about American politicians. In this study, 73 children in second grade were asked to “draw a picture of the president in 20 years,” and the respondent’s race and gender were noted. Using the data from these images, we are able to create an image of the stereotypical American president, and establish what differences exist between male and female perceptions of the presidency. The differences and overarching stereotypes found by this study could provide insight into why girls are so much less likely to go into politics, and hopefully give us a way to remedy that wrong.
Reduction of Graphene Oxide Via Electron Beam Irradiation Characterized by Structural and Resistivity Changes
Mentor: Roberto Uribe-Rendon, Ph.D.

Graphene is a material that promises much technological advancement, from more efficient solar cells to higher capacity batteries. The difficulty of synthesizing graphene currently limits its use. Graphene oxide, similar to graphene except oxygen-containing functional groups are attached to the carbon lattice. Graphene oxide is easier to synthesize than graphene; however, the functional groups reduce the electrical conductivity of the material. This process of removing oxygen groups is known as reduction and its elaboration to the final target.

The final product of their removal from graphene oxide is aptly called reduced graphene oxide. We aim at investigating if radiation from an electron beam accelerator could reduce graphene oxide. The amount of reduction is characterized with infrared spectroscopy and four-point probe resistivity measurements.

Do voters truly understand the types of property taxes that appear on the ballot in local elections, and are they fully aware of the effects of such taxes in order to vote in their own self-interest? This question is fundamentally important to local elections and the improvement of our local school districts, as much of the income acquired from property taxes goes towards the funding of school districts. Thus far, initial regression analyses have been completed using SAS that have allowed us to come to the preliminary conclusion that people are unaware of types of levies and the general setup of the property tax collection and distribution system. These conclusions have formed a solid foundation for future research that delves deeper into this topic.

Liquid crystals (LC) are often oversimplified as requiring a “hard” ring/core component and a “soft” acyclic/tail. The technical goal of this project is to design, prepare and characterize simple aromatic molecules with no tails that display discotic/columnar behavior. Such materials are potentially important as organic semiconductor materials. We have prepared triphenylene compounds with careful control of fluorination and ether substitution. These molecules were prepared using organometallic C-C bond forming reactions and a photochemical photocyclodehydrofluorination reaction; developed specifically for the controlled preparation of selectively fluorinated polynuclear aromatics. This approach has led to the discovery of a growing class of tail-free triphenylene discotic materials. We are in the process of systematically modifying the structure of the triphenylenes in order to understand the requirements for discotic behavior.

Airfoil Three-Six-Zero: Wind Tunnel Experimentation at Low Reynolds Numbers for Vertical Axis Wind Turbine Applications
Mentor: D. Blake Stringer, Ph.D.

In today’s energy market, vertical-axis wind turbines have limited use when compared to horizontal-axis turbines. However, new designs are emerging that might provide significant power generation for lower-wind applications. One configuration is of spherical design, in which the type of airfoil used is important. This research chronicles the wind tunnel experimentation of the s1210 airfoil. The objectives were to formalize a methodology to quantify the performance of the s1210 through 360 degrees’ angle-of-attack, and characterize any effects of wind-tunnel interference. Aerodynamic performance data were collected for full rotation of the airfoil. Wind tunnel interference was accounted for using correction methods. Using coordinate transformations, the driving force magnitude was determined and shows the s1210 produces a driving force in three of four quadrants of rotation.

Synthesis of New Photoactivatable (3-Hydroxy-2-naphthyl)methyl (HNM)-Based Nitroxyl (HNO) Donors
Mentors: Paul Sampson, Ph.D., and Alex Seed, Ph.D.

Nitroxyl (HNO) is a biologically relevant molecule with considerable clinical promise for the treatment of heart failure. To aid in biochemical and chemical studies, various nitroxyl donors (molecules that degrade to release HNO) have been synthesized. Our group’s focus is on the synthesis of nitroxyl donors that rapidly release HNO under physiological conditions through photoactivation. First generation donors released HNO but also experienced a side reaction. In this study, we are probing the impact of a methyl substituent at C* (2) on these competing processes. Difficulty in the synthesis of alkoxylamine intermediate 3 has led to studies of variant Mitsunobu reactions. This poster will present progress made to date on the Mitsunobu step leading to 3 and its elaboration to the final target 2.
I have developed an assay to monitor binding of RsmG to proteins binding to 16S ribosomal RNA. To achieve this goal, how RNA modification enzyme RsmG influences ribosomal ribosomal proteins. My project in Abey lab is to investigate of three different ribosomal RNAs and more than 50 biosynthesis in all living organisms. They are composed of ribosomal RNA, which will allow us to determine the binding affinity of RsmG to RNA and thus calculate thermodynamic cooperativity between RsmG enzyme and ribosomal proteins. Our findings give us more insight to how modification enzymes modulate the hierarchy of protein addition during ribosome biogenesis.

Caitlin Hawkins, Senior, Biochemistry
Mentor: Sanjaya Abeysirigunawardena, Ph.D.
Development of FRET-Based Assay to Observe Binding of RNA Modification Enzyme RsmG to 16S Ribosomal RNA

Ribosomes are the molecular machines that carry out protein biosynthesis in all living organisms. They are composed of three different ribosomal RNAs and more than 50 ribosomal proteins. My project in Abey lab is to investigate how RNA modification enzyme RsmG influences ribosomal proteins binding to 16S ribosomal RNA. To achieve this goal, I have developed an assay to monitor binding of RsmG to ribosomal RNA, which will allow us to determine the binding affinity of RsmG to RNA and thus calculate thermodynamic cooperativity between RsmG enzyme and ribosomal proteins. Our findings give us more insight to how modification enzymes modulate the hierarchy of protein addition during ribosome biogenesis.

Katherine Marie Greskovich, Sophomore, Biochemistry, and Vincent Serapiglia, Junior, Integrated Life Sciences
Mentor: Songping D. Huang, Ph.D.
Investigation of Novel Application of Gallium Cysteinate Nanoparticles in Antibiotic-Resistant Bacterial Therapies

Infections caused by antibiotic-resistant strains of bacteria have been on the rise in recent years due to overuse of conventional antibiotic drugs. Development of novel ways to combat these bacteria is essential to ensure the continuing health of the world population. We will test a gallium cysteinate nanoparticle for its ability to kill these antibiotic-resistant strains of bacteria, utilizing gallium's already-studied antibiotic properties due to its similarities to the essential metal iron. We will also investigate the possibility of utilizing a copper-bound gallium cysteinate nanoparticle in these applications.

Seth Miller, Sophomore, Engineering Technology
Mentor: Vladimir Gurau, Ph.D.
Hybrid Unmanned Aircraft System With Long-Flight Autonomy

Unmanned Aircraft Systems (UASs) are systems comprising of an unmanned aircraft vehicle (UAV), its payloads, the control station, its support subsystem and its communication subsystem [1]. UASs can be used for cargo / package delivery or as sensor platforms for data acquisition [2] such as aerial mapping, aerial surveying, precision agriculture (crop health or crop damage assessment), natural resource management (wildlife census, impact of human activities on wildlife), inspection of industrial and civil infrastructure, aerial filming and photography, news reporting or intelligence, surveillance, reconnaissance and emergency response.

Brandon T. Whitecotton, Senior, Biological Sciences; Keshav GC, Graduate Student, Chemistry; and Sanjaya Abeysirigunawardena, Ph.D.
Mentors: Keshav GC, Graduate Student, Chemistry and Sanjaya Abeysirigunawardena, Ph.D.
RsmC Stabilizes the Formation of Helix 34 of 16S Ribosomal RNA

Accurate biogenesis of the ribosome is critical for cell survival. Previous studies on ribosomal assembly suggest that post-transcriptional modification steps are important for accurate biogenesis of ribosome. Protein RsmC is an enzyme that post-transcriptionally methylates G1207 of 16S ribosomal RNA. Previous studies suggest that RsmC may assist in annealing of two RNA strands. To test this hypothesis, I carried out fluorescence-based native gel electrophoresis experiments to determine RNA annealing thermodynamics in the presence and absence of protein RsmC under various magnesium ion concentrations. My data suggest that RsmC stabilize RNA duplex at 4 mM magnesium ion concentration. This result shows that RsmC enzyme will prevent misfolding of ribosomal RNA during ribosome biogenesis.

Destiny A. Kaznoch, Senior, Chemistry, and Sanjaya Abeysirigunawardena, Ph.D.
Mentor: Sanjaya Abeysirigunawardena, Ph.D.
Investigation of the Dynamics of the Helix 18 Pseudoknot in 16S RNA

Nucleotide modifications are present in various RNAs including functionally important regions of ribosomal RNA. A pseudouridine (Ψ) and 7-methyl guanine (m7G) modified nucleotides are present in 16S rRNA. This research focuses on understanding the structural and thermodynamic effects of these two modifications and the pseudoknot as observed in the Helix 18 region of 16S rRNA and how these modified nucleotides influence folding dynamics. Conformational changes were detected using Foster Resonance Energy Transfer (FRET) experiments. The Helix 18 model RNA was constructed using two synthetic, fluorescently labeled RNA oligonucleotides. The electromobility gel shift assay showed the equilibrium dissociation constant between the two oligos was 50nM and the FRET signal increased with an increase in Mg2+ concentration.
Kaitlyn Kauppila, Sophomore, Nursing; Mara N. Deiwert, Sophomore, Nursing; and Lauren Fassnacht, Sophomore, Nursing

Mentor: Pam Stephenson, Ph.D.

An Atheistic Perspective of End-of-Life Uncertainty: A Case Study Approach

Problem and Significance:
Facing death brings about many unique questions, concerns and uncertainties; many of which are spiritual in nature. Nurses are expected to provide spiritual care to all patients, including those with nonreligious or atheistic beliefs but research is limited.

Method:
This research used existing qualitative data about end-of-life uncertainties during which one participant described having atheistic beliefs. This analysis will utilize case study methods to conduct an in-depth analysis of one atheistic account of end-of-life uncertainties. Data will be triangulated with other research and popular culture.

Results:
Findings will describe how one participant with an atheistic viewpoint experienced uncertainty related to his approaching death.

Conclusion:
This analysis helps to explain atheistic beliefs so nurses can provide spiritual care to a broader patient population.

Matthew Mysliwiec, Senior, Nursing, and Timothy Meyers, Ph.D.

Mentor: Timothy Meyers, Ph.D.

Organ Donation Simulation Education for Undergraduate Baccalaureate Nursing Students

With a well-documented organ donor shortage, organ donation has become a major public health issue. It was discovered that nursing students demonstrated a knowledge deficit related to organ donation. It is hypothesized that utilizing teaching modalities (i.e., simulation experience) will increase knowledge, skills, and attitudes related to organ donation in baccalaureate nursing students. Participants will complete the Nursing Student Organ Donation Questionnaire 2016 before and after being randomly assigned to one of two groups: 1) simulation, and 2) no intervention. The survey will be administered in the Spring 2017 semester. The goal of the simulation experience is to increase overall knowledge to better prepare nurses when they experience organ donation in their nursing career.

Melissa E. North, Senior, Nursing, and Timothy Meyers, Ph.D.

Mentor: Timothy Meyers, Ph.D.

Increasing Education on Organ Donation for Baccalaureate Nursing Students: A QSEN Approach

There is currently a lack of information available on organ donation that is relevant to nursing students. The focus of this descriptive study is to test the hypothesis that including additional material through a blackboard course will increase knowledge, skills, and attitudes of nursing students to better prepare the students for the delicacy of organ donation. As organ donation is becoming an ever-increasing healthcare priority, education that begins in nursing school is crucial. By exposing students to the delicate situations related to organ donation, the students will be more comfortable when facing this process in their nursing career.
Jessica Paul, Junior, Nursing, and Kelli Janus, Junior, Nursing
Mentor: Patricia E. Vermeersch, Ph.D.
Perceived Barriers to Electronic Medical Record Use in Post-Acute, Long-term Care

Electronic medical record (EMR), although well-used and documented in acute care settings, has moved into long-term settings such as post-acute care. A local facility has several years of experience with its EMR, but there have been difficulties in the full implementation and utilization of the EMR by its staff. The EMR is used to record patient information; therefore, it is an integral part of nursing care. The literature has identified several barriers to the utilization and implementation with EMR in the hospital or acute-care setting, but is less well studied in post-acute care. The purpose of this research was to identify barriers in the post-acute, long-term care use of EMR, and was then used to develop a tool.

Micah Ward, Junior, Nursing
Mentor: Yvonne Smith, Ph.D.
Nurses on Boards Research

Nurses are extremely underrepresented on decision-making boards both in and out of hospitals. This project examined research on Nurses on Boards to determine more information as to why nurses are not present on these boards and how nurses can be more active when seeking opportunities to serve on boards. Details were synthesized into a research matrix that is organized by the usefulness of each article. Based on this process, findings from the literature support that nurses need to advocate for themselves and seek opportunities to serve on boards, since they already have the decision-making and compassionate skills that make them well-suited for these positions.

PSYCHOLOGY – POSTER

Peyton Adams, Junior, Human Development and Family Studies; Alexa Bruderly, Junior, Psychological Sciences; Cody Geer, Senior, Psychological Sciences; Tawnia Jenkins, Senior, Human Services Technologies; Mackenzie Kiko, Senior, Psychological Services; Marcus Mick, Senior, Criminal Justice; Katherine Seidner, Senior, Human Development and Family Studies; Autumn Van Fossan, Senior, Human Development and Family Studies
Mentor: Rachael Blasiman, Ph.D.
The Role of Executive Functions in Spoken Word

Executive functions are basic processes that underlie thought and behavior. Three executive functions - updating, shifting and task switching - have been identified. Past research has examined these functions in relationship to reading comprehension, mathematical understanding, intelligence and learning disability. The current study aims to extend this research to spoken word. Participants completed measures of executive function, recited a poem and provided a short speech. Audio recordings were analyzed for irregularities such as pauses, errors and filler words. The results are discussed in terms of spontaneous dialogue, prepared speech, and the role of individual executive functions in spoken language.

Nabria Beasley, Senior, Psychological Sciences
Mentor: Kelly Cichy, Ph.D.
Gender Differences Between Mothers and Fathers in Exposure and Reactivity to Parenting Stressors

This study examined gender differences between mothers and fathers in exposure to parenting stressors. This study also examines reactivity to parenting stressors by examining associations between parents’ parenting stressors and their health and wellbeing. Participants included 1,138 individuals who identified as parents (N=113 from the Midlife in the United States Survey (MIDUS II) and the National Study of Daily Experiences (NSDE II)). Participants’ ages ranged from 33 to 84 years. Respondents self-reported their physical health, mental/emotional health, marital status and number of children. For a series of eight days, respondents also reported on the stressors they experienced that involved their children (i.e., parenting stressors), as well as their negative effect and physical health symptoms.

Emily Berndt, Senior, Psychological Sciences
Mentor: Rachael Blasiman, Ph.D.
The Effect of Stress on Physical Health, Emotional Well-Being, and Cognition

This study aims to examine the physiological, emotional, and psychological effects of stress on the human body. The goal I have for this study is to find how stress affects people, particularly college students, in order to gain a better understanding of how to help people better manage their stress. The study is a quantitative, quasi-experimental, correlational design and will focus on students within a university setting. I am using a variety of surveys to see how stress affects participants’ lives and if there are any correlations between stress and wellbeing. I hypothesize that stress will show a negative correlation with emotional health and cognitive wellbeing, and a positive correlation to physiological symptom reporting. This study has been approved and I am currently collecting data.

Brittany Blier, Senior, Psychological Sciences; Logan Kochendorfer, Graduate Student, Experimental Psychology; Jennifer R. Wagner, B.S.; and Kathryn Kerns, Ph.D.
Mentor: Kathryn Kerns, Ph.D.
Parental Emotion Socialization in Late Childhood and Early Adolescence

The way parents socialize, or respond to, their children’s negative emotional expressions provide an important context for the development of adequate coping skills in childhood. Six traditional approaches have been highlighted as response strategies used by parents. However, these strategies have only been examined with closed-response questionnaires filled out by parents of young children. The present study, which used an open-ended approach, expands on previous research by testing the six traditional approaches in parents with older children (ages 9-14 years), and by exploring whether parents use new emotion socialization strategies in different situations. Results suggest that parents continue to use the six traditional approaches with older children, while also using three new approaches, and the use of different strategies depended on context.
Marie Childers, Junior, Psychological Sciences; Michael A. Eskenazi, Ph.D.; Angela C. Jones, Ph.D.; Ashley N. Abraham, Graduate Student, Psychological Sciences; and Jocelyn R. Folk, Ph.D.

Mentor: Jocelyn Folk, Ph.D.

Spelling Ability Affects Homophone Processing During Reading; Frog and Towed Are Friends

Individual differences in spelling ability may lead to differential orthographic processing during reading (Andrews & Low, 2013), and may contribute to null effects when individual differences are not considered (Andrews & Hersch, 2010). We hypothesized that differences in spelling ability may contribute to phonological processing during reading. Participants made lexical decisions on words (e.g., FROG) that were briefly primed by a semantic associate (e.g., TOAD) or a homophone of the associate (e.g., TOWED).

Importantly, individual difference results indicated that spelling ability influenced priming. Low spelling ability, regardless of reading ability, led to priming from both prime types. High spelling ability, regardless of reading ability, only led to priming from the semantic associate. Thus, spelling ability contributes to differences in phonologically mediated, semantic activation during reading.

Courtney Costanzo, Junior, Psychological Sciences; Maeson S. Latsko, Graduate Student, Experiential Psychology

Corticosterone Ameliorates the Adult Social Behavior Deficits Caused by Peripubertal Social Defeat

Our lab exposes peripubertal (P30) mice to repeated aggressive social defeats, followed by tests for social interaction. When mice are tested 24 hours after defeat, all defeated mice display interaction. When the same mice are tested in adulthood (P62), some display social avoidance, whereas others display normal social interaction. Corticosterone over night prior to social interaction testing at P32 ameliorates the deficits in adult social behavior caused by peripubertal social defeat. Pharmacologically blocking glucocorticoid receptors blocks enhanced social behavior produced by corticosterone administration. Mice administered corticosterone, but not subjected to a social interaction test at P32, do not display increased social behavior as adults. These data suggest that corticosterone interacts with re-exposure to ameliorate the social behavior deficits caused by peripubertal social defeat.

Ya’el Courtney, Junior, Biochemistry

Mentors: Todd Braver, Ph.D., and Debbie Yee, Graduate Student

Reward vs. Punishment: An fMRI Analysis Approach to Identifying the Neural Substrates of Motivation and Cognitive Control

Every day, humans face the complex cost-benefit analysis of integrating different incentives to pursue behavioral goals. Impairments in cognitive control (and particularly an abnormal response to motivation) underlie disorders such as schizophrenia, anxiety, depression and addictions. As such, it is important to illustrate how differing motivational cues are processed in healthy humans. Specifically, whether rewards and punishments utilize the same neural substrates to yield motivational effects was studied. In the current study, participants performed a cuing-task-switching paradigm during two fMRI scanning sessions. Reward and punishment incentives resulted in comparable behavioral task performance, but our analysis revealed several regions of interest that appear to be distinct between the conditions. This suggests the exciting result that reward and punishment motivations are processed via different neural substrates.

Catelyn Dorsey, Junior Psychological Sciences; Benjamin Siglow, Senior, Psychological Sciences; Delilah Elizey, Graduate Student, Clinical Psychology; Kallie Petitti, Graduate Student, School Psychology; Martale Davis, Graduate Student, Psychological Sciences; Elizabeth Jean, Graduate Student, Psychological Sciences; Robert Stadulis, Ph.D.; and Angela Neal-Barnett, Ph.D.

Mentors: Delilah Elizey, Graduate Student, Clinical Psychology; Benjamin Siglow, Senior, Psychology; Kallie Petitti, Graduate Student, School Psychology; Angela Neal-Barnett, Ph.D.; and Elizabeth Jean, Graduate Student, Psychological Sciences

Feasibility and Effectiveness of a Musical Cognitive Restructuring App for Black Middle School Girls

Mobile applications have become useful tools in behavioral health interventions. While several applications have been developed for adults, apps for youth and minority populations are sorely lacking. This study examined the feasibility and effectiveness of a musical cognitive restructuring app for managing negative thoughts. We hypothesized that youth would like the idea of an app, find it helpful to reduce anxiety and use it daily. Eighty-eight girls were enrolled in the Sisters United Now (S.U.N) anxiety intervention. During the intervention, girls were introduced and taught to use the SUN app. Quantitative data indicated girls were excited to use the app, enjoyed recording their song, and believed the app would help with anxiety. Both quantitative and qualitative results indicated the initial app was feasible.

Julia Fouty, Senior, Psychological Sciences; Samantha Ortiz, Graduate Student, Psychological Sciences; Maeson S. Latsko, Graduate Student, Experiential Psychology; and Aaron Jasnow, Ph.D.

Mentor: Aaron Jasnow, Ph.D.

A Neural Circuit Controlling Fear Generalization

A characteristic of anxiety disorders is the generalization of fear to neutral stimuli. Immediately after context fear-conditioning, mice display higher levels of freezing in the training context compared to a novel context; over time, mice generalize their fear to novel contexts. Using chemogenetics, we investigated the fear generalization circuit by disrupting projections from either the ventral hippocampus (vHPC) or the anterior cingulate cortex (ACC) to the basolateral amygdala (BLA). Inhibiting projections from the vHPC to the BLA reduced freezing in the novel context; whereas, inhibiting projections from the ACC to the BLA completely eliminated freezing in the novel context. These results suggest a fear generalization circuit and are helpful in understanding the neural processes involved in generalized anxiety disorders.
Women are more likely than men to suffer from anxiety disorders. A characteristic of many anxiety disorders is generalization of fear responses, resulting in expression of fear to neutral stimuli. We’ve shown that estradiol induces fear generalization in female rats, but reduces it in males. Here, we examined the role of glutamate receptors in estradiol induced generalization in female rats and uncovered potential brain regions associated with reduced generalization in males. We found that glutamate receptors are necessary for estradiol induced fear generalization, and that the dorsal CA1 region of the hippocampus, but not the bed nucleus stria terminals play a role in reduced generalization in males. Understanding the sex-dependent influences of estradiol on generalization will allow for improved, sex-specific, treatments for many anxiety disorders.

Rats learned a rule-based serial pattern that consisted of seven chunks (123-234-345-456-567-678-781). After learning to a high criterion on all elements of the pattern, rats were given injections of scopolamine 30 minutes before testing on a transfer pattern consisting of the training pattern with an added eighth chunk that was either consistent with pattern structure (chunk “812”) or contained an element that violated pattern structure (chunk “818”). Under scopolamine, rats in both groups extrapolated a terminal element that violated pattern structure (chunk consistent with pattern structure (chunk “812”) or contained pattern with an added eighth chunk that was either testing on a transfer pattern consisting of the training pattern, 123-234-345-456-567-678-781-818, where the final “violation element” is inconsistent with pattern structure. Rats were trained twice to an 85 percent correct criterion on the violation element prior to retention for a single pattern element that violated pattern structure. Violation elements were targeted because they are typically unusually difficult to learn, contrasting with rule-learning in the structured pattern. Rats learned to nose-poke in the pattern, 123-234-345-456-567-678-781-818, for reinforcement after a one-day, 10-pattern retention test on the same pattern. Results indicated that rats had approximately 57 percent retention after two weeks and 28 percent retention after four weeks. The results indicate that serial pattern memory can be assessed by characterizing forgetting curves.

Students learn declarative concepts (e.g., positive reinforcement) in many courses. Previous research shows that providing students with examples enhances concept comprehension. However, a common goal is for students to be able to apply concepts in novel contexts. The current research investigated if provided examples can benefit novel application. All participants read a text containing definitions and one example for 10 psychology concepts. Participants either practiced retrieving concept definitions or provided examples. On each trial, participants were given the concept term and were asked to recall and re-study the target information until correctly recalled three times. Two days later, participants completed tests, including example generation. The examples group outperformed the definitions group on the example generation test, showing that provided examples can benefit novel concept application.
Social Support from Adolescent Latina Mothers’ Fathers Is Related to Lower Psychological Distress

Megan Kasperszcyk, Senior, Psychological Sciences; Marissa Gastelle, Graduate Student, Psychological Sciences; Rachel Murray, Junior, Psychological Sciences; and Josefina Grau, Ph.D.

Mentors: Marissa Gastelle, Graduate Student, Psychological Sciences, and Josefina Grau, Ph.D.

Adolescent Latina mothers are at increased risk for developing symptoms of psychological distress. High levels of poverty, acculturative stressors, and less education than other adolescents compound with stressors associated with parenting at a young age. Social support has been shown to reduce the risk of psychological distress, but several factors influence that relation. The current study examines associations between social support from adolescents’ mothers and fathers and psychological distress, and how the associations may be moderated by familism. Results indicated that mother support was not related to lower distress but father support was. Familism did not moderate these relations. Findings expand research on grandfather support, but further research is needed to examine why there were differences in distress between mother and father support.

Working Memory and Perception of Difficulty in Complex Category Learning

Jessica Kotik, Junior, Psychological Sciences, Carly G. Nelson, Senior, Speech Pathology and Audiology

Mentors: Christopher A. Was, Ph.D. and Erin Graham, Graduate Student, Psychological Sciences

Does working memory (WM) capacity predict complex category learning and perception of task difficulty? We hypothesized that adolescents with higher WM capacity would be more accurate when learning categories and that they would perceive the task as easier than individuals with limited WM capacity. In the present study, participants were presented with a complex category learning task, two measures of working memory capacity, a novel transfer task, and a questionnaire asking them about strategy usage and perceived task difficulty. They were assigned to high and low WM groups based on scores from the two working memory capacity measures. Preliminary results indicate that the high WM group was more accurate when learning categories and also rated the task as less difficult than the low WM group.

Effects of Drug of Choice on Memory and Cognition

Marranda Martin, Senior, Psychological Sciences

Mentor: Angela Junglen, Graduate Student, Experimental Psychology

Throughout the literature, it has been shown that drugs and alcohol affect brain. The brain regions and neural processes that underlie addiction overlap with processes and functions including learning, memory and reasoning (NIH). Exactly how much does an individual’s drug of choice impact memory and cognition differently during detox? We recruited participants at Oriana Detox Center voluntarily seeking detoxification from substance dependence. Throughout the study, participants filled out several questionnaires regarding substance use behaviors and completed a cognitive assessment. The aim of this study is to investigate the impacts of different drugs on cognition at the early stages of sobriety. We hypothesize both opioids and alcohol will have negative effects on cognition and memory, but alcohol’s effects will be significantly more damaging.

Acculturation Gap Among Adolescent Latina Mothers in Relation to Psychological Adjustment

Rachel E. Mason, Senior, Psychological Sciences, and Rachel Murray, Junior, Psychological Sciences

Mentors: Josefina Grau, Ph.D., and Aimee Hammer, Graduate Student, Psychological Sciences

Acculturative Gap Among Adolescent Latina Mothers in Relation to Psychological Adjustment

Mentors: Josefina Grau, Ph.D., and Aimee Hammer, Graduate Student, Psychological Sciences

Acculturation Gap Among Adolescent Latina Mothers in Relation to Psychological Adjustment

Mentors: Josefina Grau, Ph.D., and Aimee Hammer, Graduate Student, Psychological Sciences

Adolescent Latina mothers have the highest birth rate among all ethnic groups in the United States and are at higher risk of experiencing depressive symptoms. Maladjustment of the mother can result in other negative outcomes, such as poor parenting, family functioning, and child development. The current study examined the acculturation gap between mothers and grandparents and how it is associated with mothers’ psychological adjustment. Results indicated that mother-grandmother dyads in which the mothers believed that the grandmother viewed them as too Americanized, had mothers who experienced more psychological distress. Findings inform intervention efforts targeting depressive symptoms in this at-risk population. Findings suggest that interventions should focus on overcoming intergenerational and intercultural conflict, promoting mutual understanding and building skills that enhance communication.
Kara M. Shaver, Sophomore, Psychological Sciences; Bradley Davis, Junior, Psychological Sciences; Anna Wise, Graduate Student, Psychological Sciences; and Douglas Delahanty, Ph.D.

Mentors: Anna Wise, Graduate Student, Psychological Sciences, and Douglas Delahanty, Ph.D.

Thy1 Neuron Activation in BLA Promotes Fear Inhibition and Attenuates Fear Reconsolidation

Thy1 neurons are a subset of glutamatergic neurons found throughout the brain, including the basolateral amygdala (BLA), a region important for controlling fear. We used chemogenetics (DREADDS), to selectively activate the Thy1 neurons in the BLA, combined with multiple tests of fear. We found that activating the BLA thy1 neurons following a 10-minute extinction training was effective in reducing fear when tested with passive avoidance paradigm. We also found that activation of the BLA thy1 neurons following a 30s-reactivation period significantly reduced fear when animals were tested 48 hours later. This suggests that thy1 neurons play an important role in attenuating fear under multiple learning conditions and may inhibit fear responses more generally.

Mentors: Sohini Dutta, Graduate Student, Psychological Sciences, and Aaron Jasnow, Ph.D.

Parental and Child Empathetic Relationship Following Pediatric Trauma

Parent-child dyads were recruited from Akron Children's hospital emergency department and completed questionnaires during their time in the emergency department and also at two-week post-injury. We hypothesize that children who are high in empathy and low in emotional distress immediately following the trauma will be associated with parental acute stress symptoms at two-weeks post injury. Data collection is ongoing; however, results will be incorporated into the poster presentation. If we can identify these individuals immediately following the traumatic event, we can intervene with resilience strategies earlier in order to prevent the development of chronic distress, including post traumatic stress symptoms.

Mentor: Jocelyn R. Folk, Ph.D.

Measures Matter: Reading Comprehension May Not Be the Best Measure of Reading Ability

Reading comprehension is often used to assess reading skill. However, recent research suggests that spelling may be a better indicator of reading ability (Andrew & Bond, 2009). The lexical quality hypothesis suggests that this is because high-skill spellers have strong representations of a word's spelling and that the spelling is strongly connected to a word's meaning (Perfetti, 2007). Therefore, high-skill spellers should spend less time processing words than high-skill readers. The current study assessed both reading comprehension and spelling ability. Participants were then asked to read sentences while their eye movements were tracked. Results show that there was a moderate correlation between reading comprehension and spelling ability, r = .30, p < .05. Results also indicate that good spellers spend less time processing words than good readers. The results support previous research and indicate that spelling skill may be a better predictor of reading ability than reading comprehension measures.

Mentor: Jocelyn R. Folk, Ph.D.

Lischele Watkins, Senior, Psychological Sciences

Thy1 Neuron Activation in BLA Promotes Fear Inhibition and Attenuates Fear Reconsolidation

Thy1 neurons are a subset of glutamatergic neurons found throughout the brain, including the basolateral amygdala (BLA), a region important for controlling fear. We used chemogenetics (DREADDS), to selectively activate the Thy1 neurons in the BLA, combined with multiple tests of fear. We found that activating the BLA thy1 neurons following a 10-minute extinction training was effective in reducing fear when tested with passive avoidance paradigm. We also found that activation of the BLA thy1 neurons following a 30s-reactivation period significantly reduced fear when animals were tested 48 hours later. This suggests that thy1 neurons play an important role in attenuating fear under multiple learning conditions and may inhibit fear responses more generally.

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Mentor: Jocelyn R. Folk, Ph.D.
Mentor: Hayley S. Arnold, Ph.D.

Inhibitory Control in Preschool-Age Children Who Stutter

The primary goal of this study was to investigate the relationship between inhibitory control and stuttering in preschool-age children. Participants were 16 children who stutter and 23 children who do not stutter. They were assessed using behavioral responses to three experimental tasks as well as parent responses to a questionnaire. Results indicated that age was significantly correlated to five of the eight inhibitory control measures. However, no significant difference between talker groups was found. The significant association between age and measures of inhibitory control suggests that age may be important. During the preschool-age years, group differences may not be as evident due to high levels of variability. Later in development, differences in inhibitory control may be more evident between groups.

Mentor: Cindy Widuck, M.P.H.

The HateHate Campaign: A Dual Intervention Approach to Combating Stigma Associated With the LGBTQ+ Homeless Community

The HateHate Campaign strives to build a new and accessible guide to connect the LGBTQ+ homeless population to needed resources. Its sister site, HateHateResources (HHR), increases awareness through ally education and inclusion and decreases negative attitudes among the general population. Risks associated with unreliable housing, decreased access to existing resources, and low resource navigation skills within this population has created decreased access to existing resources, and low resource availability. Twenty percent of homeless youth is LGBTQ+, while only 10 percent of the general population identify as part of this community.

Mentor: Kim Nielsen, Ph.D., and Gbenga Ajilore, Ph.D.

The Expected Cost of Housing Discrimination

The aim of this research is to increase the understanding regarding discrimination in the home rental market, especially in a way that is applicable to individuals, by constructing a framework with which its expected cost can be found. After estimating an expected cost, this research seeks to use that cost as a platform to explore conditions surrounding this expected cost. Furthermore, this research makes a case for why this should be an important issue among disability studies scholars and disability rights activists.

Mentor: Hayley S. Arnold, Ph.D.; Perri Waisner, Senior, Speech Pathology and Audiology; and Cydney Woodyard, Senior, Speech Pathology and Audiology

Inhibitory Control in Preschool-Age Children Who Stutter

Quinton Babcock, Junior, Economics, University of Toledo

Mentor: Kim Nielsen, Ph.D., and Gbenga Ajilore, Ph.D.

The Expected Cost of Housing Discrimination

Nina Darden, Junior, Public Health; Nejla Shaheen, Senior, Public Health; Tim Mikes, Senior, Public Health; and Cole Wojdacz, Junior, Public Health

Mentor: Cindy Widuck, M.P.H.

The HateHate Campaign: A Dual Intervention Approach to Combating Stigma Associated With an Increasing Resource Access for the LGBTQ+ Homeless Community

Twenty percent of homeless youth is LGBTQ+, while only 10 percent of the general population identify as part of the community. Risks associated with unreliable housing, decreased access to existing resources, and low resource navigation skills within this population has created significant barriers to ending the cycle of homelessness that disproportionately affects members of this community. The HateHate Campaign works to combat stigma and increase awareness through ally education and inclusion and decrease negative attitudes among the general population. Its sister site, HateHateResources (HHR), strives to build a new and accessible guide to connect the LGBTQ+ homeless population to needed resources.

Mentor: Nina Darden, Senior, Public Health; Nejla Shaheen, Senior, Public Health; Tim Mikes, Senior, Public Health; and Cole Wojdacz, Junior, Public Health

Samuel M. Doerle, Senior, Pre-Medicine/Pre-Osteopathy; Vivek V. Jasti, Senior, Integrated Life Sciences; and Richard E. Adams, Ph.D.

Factors Affecting Adolescent Happiness in the United States

Mentor: Richard E. Adams, Ph.D.

Factors Affecting Adolescent Happiness in the United States

We aim to show how culture may affect how people behave as it relates to nutrition, and how well they can interpret standard nutrition labels and other information that they encounter every day under positive and negative cultural stimuli.

Mentor: Curtis Reynolds, Ph.D.

Sophia Greathouse, Senior, Economics

Integrating Life Sciences; and Richard E. Adams, Ph.D.

Factors Affecting Adolescent Happiness in the United States

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Several key variables have been previously identified as causative factors of teenage happiness: parental relationships, religiosity, and friendship quality. We hypothesize that substance use and deviance mediate the pathways of religiosity and parental relationships on happiness. Data were obtained from the 1994 National Longitudinal Study of Adolescent to Adult Health. The dependent variable, happiness, was formed as an index from the following items: suicidal tendency, depression and life satisfaction. A multivariate analysis was performed with several other independent demographic variables, such as sex and age. Results indicated that both religiosity and parental relationships have a positive association with happiness. This association is reduced when substance use and deviance are added to the analysis; these factors partially mediate the associations with adolescent happiness.

Mentor: David Sharp, Ph.D.

Race relations and perceived stereotype threat is a growing topic in the sciences. The purpose of this study is to assess the relationship between environmental pressures related to cultural identity and nutrition and other health behaviors. We aim to show how culture may affect how people behave as it relates to nutrition, and how well they can interpret standard nutrition labels and other information that they encounter every day under positive and negative cultural stimuli.

Mentor: David Sharp, Ph.D.

Sophia Greathouse, Senior, Economics

Discrimination in the Restaurant Industry in Ohio

This paper explores the size of discrimination in the restaurant industry in Ohio in 1980 and 2010. OLS regressions were used in order to discover the differences in wages between different groups. A set of Oaxaca decompositions were implemented to determine how much of the differences, if any, could be attributed to discrimination. I found that African American workers make 17.8% less than their white counterparts. Discrimination may be even worse than this wage gap allows: when comparing African American workers to a counterfactual treated with white coefficients, the African American workers make 17.8% less than the white coefficient counterfactual. This effect seems nonexistent when comparing Hispanic and white workers. When comparing men and women, women make significantly less in almost every case.

Mentor: Isaac Floyd, Senior, Nutrition

Te’mató Te’mató: How Does Your Cultural Identity Influence Your Health?

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Isaac Floyd, Senior, Nutrition

Mentor: David Sharp, Ph.D.

Teléfono Te’mató: How Does Your Cultural Identity Influence Your Health?

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Mentor: Isaac Floyd, Senior, Nutrition

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Michaela M. Judy, Junior, Business Management
Mentors: Tabitha M. Martin, M.A.; Trevor Watkins, M.S.; and Elizabeth Sinclair, M.A.
The Key Factors of Combat Uniforms that Contribute to Increasing Casualties in Modern Warfare

Combat uniforms are meant to protect our troops from the dangers they face on the battlefield. Gear designed specifically to protect service members from bullets have not been designed with recent combat environments in mind. After conducting several interviews, with veterans and current soldiers, the recommendations were to create a uniform that was more durable and breathable. Breathable uniforms allow for air movement around the body, keeping them cooler in unbearable heat and protecting them from weather-related medical conditions, such as heat stroke. Also, soldiers sometimes will take off parts of their uniforms, such as their vests, because they are extremely hot, which affects the gear’s usefulness.

Aja Labrador, Senior, Economics
Mentor: Lockwood Reynolds, Ph.D.
How Stagnant Wages Affect Housing Affordability

Data indicates average wages have remained stagnant since the 1980s. Research regarding stagnant wages and rising housing costs helps us understand what results from rising housing costs and static wages. Data is collected from counties in the United States between 1980 and 2014 to document that households are spending more income on rent on average. Then, I look for whether there are similar trends throughout all counties that may lead to inability to afford housing. A quantitative analysis is used to conduct research and analyze data collected by each county. A hedonic regression is used to analyze results for replication and a closer look at characteristics affecting the inequality. Results show that nationally, people spend 565 percent more income on rent in 2014 than in 1980.

Claire Marshall, Junior, Sociology
Mentor: Molly Merriman, Ph.D.
Sexual Consent in the Media: From Screen to Silence

Sexual Consent in the Media: From Screen to Silence will talk about the many different definitions of consent, where these definitions come from, and why it is damaging to not have a clear idea of what sexual consent is. I will show images of advertisements with slogans and images clearly indicating sexual violence. These images become what we think of as “normal,” and make sexual violence accepted in our society.

Veronica K. Musser, Junior, Speech Pathology and Audiology
Mentor: Kelly Cichy, Ph.D.
Access to Health Care and Perceived Neighborhood Quality

Prior research suggests that neighborhood context contributes to an individual’s access to health care. This study expands upon prior research by exploring associations between perceived neighborhood quality and healthcare access and utilization. Based on prior studies, I hypothesize that those who perceive their neighborhood more favorably will also report greater access to healthcare. Data are from the second wave of the midlife in United States Survey (MIDUS II). Respondents include 7,105 men and women (Mage =56). Participants responded about perceived neighborhood and a series of items about health care access and utilization. Lastly, participants provided demographic information. All analyses will control for demographics including gender, education and availability of health insurance. To test the hypothesis, I will examine the associations between perceived neighborhood quality and health care utilization.

Veronica K. Musser, Junior, Speech Pathology and Audiology;
Madeline Steward, Junior, Psychological Sciences and Sociology; and Jake Graff, Senior, Psychological Sciences and Sociology
Mentor: Richard Adams, Ph.D.
“Our Kids” An Extension of Robert Putnam’s Study of the Wealth Gap Inequality in America Hudson and Ravenna: Miles Apart Yet Worlds Apart

Over the past 60 years, the gap between social classes in terms of wealth and income has been growing rapidly, and in turn has created a great inequality in life chances between the upper and lower class. The current study is a continuation of Robert Putnam’s scholarly study, “Our Kids,” where we compared two Ohio cities: Hudson and Ravenna. In Hudson, 68.9 percent of individuals obtain a bachelor’s degree or higher compared to Ravenna, where only 13.3 percent of individuals have a bachelor’s degree or higher. We hypothesized that Ravenna, having a lower socioeconomic status, would have more barriers to learning than Hudson, with the higher socioeconomic status. Our study consisted of database searches and in-depth interviews regarding the experience of a typical high school student in that city.

Julie Novario, Junior, Public Health; Jessica M. Lockhart, Senior, Public Health; Abigail E. Day, Senior, Public Health; and Travis J. Wisler, Senior, Public Health
Mentor: Cindy Widuck, M.P.H.
W.H.Y. Campaign – We Hear You: Improving Mental Health in College Freshmen

Depression and anxiety in college freshman has grown from 10-15 percent in the 1980s to 33-40 percent today. Through research on previous interventions and statistics collected from colleges across the United States, we have determined that mental illness on college campuses goes unrecognized. Concern of stigma is the number one reason students do not seek help. From these findings, we have developed an intervention to implement in freshman courses and residence halls. Our campaign, We Hear You (W.H.Y), aims to improve mental health in college freshmen through multimedia using creative mental health educational presentations and connecting students efficiently with on- and off-campus mental health resources. We wish to see reduction in stigma of mental illness by use of surveys before and after the intervention.
Abigail Elaine Recker, Senior, Early Childhood Education; Bridget Mulvey, Ph.D.; and Joseph Ortiz, Ph.D.

Mentors: Bridget Mulvey, Ph.D., and Joseph Ortiz, Ph.D.

Becoming Scientists: Investigating Human Impact on Water

This unit helps students in grades three to five understand how natural resources are impacted by human actions through observation, inference and the use of scientific tools and data. Students act as Dr. Ortiz’s assistants to help find out why the water in Lake Erie is polluted. They examine water samples from local water sources, make observations and inferences, and research their ideas with support. Finally, the students create an action plan to make a difference and share their findings with Dr. Ortiz. This hands-on approach to science content supports high levels of engagement and an intrinsic motivation to learn. Language arts standards are integrated with science standards in this problem-based science unit. Student learning is assessed through work samples and an observational checklist.

Katherine Reynolds, Senior, Speech Pathology and Audiology

Mentor: Jennifer Roche, Ph.D.

Effects of Emotional Contagion on Texting

Face-to-face communication uses multimodal behavioral cues (e.g., tone of voice and facial expression) that are available to facilitate accurate interpretation of intentions. Unfortunately, these cues are limited with involvement in computer-mediated communication (e.g., texting). In recent research, it has been indicated that vocal tone in text, may be expressed through the use of punctuation (Gunraj et al., 2016). It is currently less well known how punctuation impacts a receiver’s emotional experience with a “rude” or “kind” texter. Results indicated that receivers tended to avoid contentious communicative interactions by diverging emotionally, but promote the positive interaction by converging emotionally. This is interesting because it provides insight into the emotional contagion literature that says maximal convergence is not always useful.

My’Quella Swogger, Senior, Fashion Merchandising

Mentor: Linda Hoepn-Poling, Ph.D.

The Effects of Poverty on McNair Scholars’ Educational Attainability

This presentation examines a study on the effects of poverty on first-generation college students who are currently earning an undergraduate degree as McNair Scholars. The purpose of this study was to reveal well-being as it has strong correlations to educational attainment and poverty, and aims to reveal the manifestation of poverty in undergraduate students’ lives, particularly those in the McNair Scholars Program and how poverty affects their academic achievements specifically as first-generation college students. The goals of this study include (a) reveal information that might contribute to the success of McNair and other TRIO participants, (b) contribute to existing research on how to work towards class equity, economic justice and educational reform, and (c) provide an opportunity to share participants’ expressive stories about their college journey thus far.

Nicole E. Teefy, Senior, Public Health, and Cindy Widuck, M.P.H.

Mentor: Cindy Widuck, M.P.H.

Eating Affordable Together

Our intervention, Eating Affordable Together, provides young adults and their families with education and skills to achieve a healthy lifestyle while reducing the obesity in adolescents within Portage County. The obesity rate since the 1980s in teens has gone from 5 percent to over 20 percent. In Portage County, 15 percent of youth are considered obese. We are focusing on adolescents and their parents because adolescents depend on these parents or legal guardians for guidance and resources such as food. We would like to implement workshops consisting of healthy cooking demonstrations, budgeting classes and different diet options. With the series of classes for an after-school program, over time we will implement every aspect we feel necessary to have within an individual’s lifestyle to be as healthy as possible.

Lakysha R. Robinson, Senior, Criminology  
*Mentor: Julie Globokar, Ph.D.*

**IDEA: Examining the Over-representation of African-American Students With Disabilities from 2013-14**

The purpose of this study is to detect whether there is an over-representation of African-American students with disabilities being served under IDEA in school districts in Wisconsin. This study will also examine what school factors might explain this variation.

Thimberley Morgan, Sophomore, Speech Pathology and Audiology; Jennifer Roche, Ph.D.; and Nicole Craycraft, Vanderbilt University  
*Mentor: Jennifer Roche, Ph.D.*

**Avoiding Miscommunication May Be Problematic for Conversation**

Miscommunication is often seen as something that should be avoided when communicating. When individuals perceive the conversation to be filled with communication errors, there is often a feeling of disappointment because effective communication is essential to social interaction. This project shows that miscommunication beneficially impacts our automatic cognitive processes by recruiting attentional resources when information is not clearly communicated.

The Ohio Space Grant Consortium Undergraduate Research Symposium Best Poster Award

This award is given to the best poster presented at the Undergraduate Symposium on Research, Scholarship and Creative Activity and represents the best submission among the non-health science related posters on a topic relevant to the National Air and Space Administration (NASA) and the Ohio Space Grant Consortium (OSGC). The award will be presented by Joel D. Ortiz, Professor, Department of Geology and Ohio Space Grant Consortium Campus Representative.
Provost’s Leadership Academy

The Provost’s Leadership Academy provides incoming Kent State University students with a unique leadership experience on campus. The mission of the Provost’s Leadership Academy is to develop leadership in talented first-year students. The vision of the Provost’s Leadership Academy is that the participating students will become leaders and change agents in the university community.

During the fall semester, the academy’s goal is for participants to understand their leadership style, each other, and the community through activities and programs, from which they will generate a list of possible areas of concern within the university community that could be addressed. During the spring semester, students work in teams of seven to ten students with a peer mentor to develop a project proposal that will create a solution or improve a possible need or area of concern within the university.

Please join us in welcoming our newest researchers. Their presentations can be observed in Room 314, Kent Student Center from 1 – 3:30 p.m. today.

Student Research Groups

Stephanie Baker, Freshman, Pre-Nursing; Gabrielle Calder, Freshman, Fashion Merchandising; Noelle Elliott, Freshman, Digital Media Production; Nicholas Marsteller, Freshman, Entrepreneurship and Managerial Marketing; Mackenzie Phelps, Freshman, Political Science; Emma Seyffert, Freshman, Fashion Merchandising; Mengting Yuan, Freshman, Fashion Merchandising; Serena Zacour, Freshman, Speech Pathology and Audiology; and Michael Zapotosky, Freshman, Athletic Training
Mentor: Abigayle Horton, Junior, Speech Pathology and Audiology
Project: Swipe Swap

Rachel Aldrich, Freshman, Pre-Nursing; Bradley Dennis, Freshman, Psychology; Laura Fox, Freshman, Visual Communication Design; Holly Gustafson, Freshman, Fashion Design; Mackenzie Hanuscin, Freshman, Early Childhood Education; James Hoyt, Freshman, Criminology and Justice Studies; Gabriella Moreland, Freshman, Biology; Kayla Proctor, Freshman, Public Relations; and Elizabeth Smith, Freshman, Architecture
Mentor: Carmen Dotterer, Sophomore, Visual Communication Design
Project: Light the Way

Diamonique Bagley, Chemistry (Pre-Medicine); Emily Engler, Biotechnology; Niles Hand, Architecture; Kathleen McHugh, Pre-Nursing; Nathan Reineck, Journalism; Kylee Saksa, Exploratory; and Ellen Stingel, Fashion Merchandising
Mentor: Lindsay Jespersen, Senior, Bio-Chemistry
Project: Kent Connection

Kody Elsayed, Public Relations; Hannah Engle, International Relations; Caroline Henneman, Public Relations; Montgomery Hujar, Fashion Merchandising; Hannah Jones, Early Childhood Education; Krista Mattern, Biology; Seneca Powers, Fashion Merchandising; Natalie Quagliieri, Engineering Technology; and Mallory Schmelzer, Accounting
Mentor: Clara Sullivan, Sophomore, Public Relations
Project: Club Hub

Meeghan Barrett, Fashion Design; Rachel Berg, Nutrition; Kelly Corey, Marketing; Julianne Enwright, Visual Communication and Design; Maura Flaherty, Architecture; Jeffrey Gonzalez, Sports Administration; Samantha Greene, Integrated Language Arts; Kaitlyn Johnson, Managerial Marketing; Anna Massey, Fashion Design; and Robert Matos, Business
Mentor: Jessica Kotick, Junior, Psychology
Project: Ucommute

Cheyenne Battle, Fashion Merchandising; Brittany Berg, Interior Design; Abigail Ferraro, Fashion Merchandising; Fearon Himes, Biology; Tori Lones, Architecture; Mathews Nobre Priosti, Biology; Monae Pouljot, Fashion Merchandising; Charla Shellenberger, Psychology; and Jenna Vicker, Pre-Nursing
Mentor: Luis Pena Ochoa; Psychology, Sophomore
Project: Kent Go Home

Flash Defense

Rachyl Anderson, Sociology; Suzanne Hales, Biology; Kathryn Kleinmans, Translation; Leah Lerbew, Fashion Merchandising; Ryon Lee, Fashion Merchandising; Nafees Mahmood, Computer Science; Dana McKinney, Photo Illustration; and James Trombka, Exploratory
Mentor: Wyatt Mauti, Sophomore, Pre-Nursing
Project: Flash Trips