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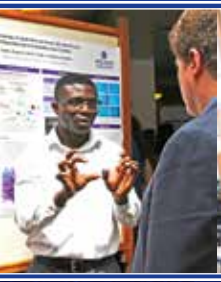
WILSON COLLEGE




# 10th Annual Student Research Day

Celebrating the Creative and Scholarly Achievements of Wilson Students

May 3, 2019

# 10th Annual Student Research Day

Welcome to the tenth annual Wilson College Student Research Day. Student Research Day continues to be my favorite day of the academic year because the research presented, undergraduate and graduate, is the culmination of the academic experience at Wilson College. Everything students have learned at Wilson, from writing papers—over and over—and classroom debates to field and lab experiences, comes together to create these capstone presentations. This year's event is extra special because we are also celebrating our institution's Sesquicentennial—our 150th anniversary of the founding of Wilson College.

At Wilson, students are exposed to a broad-based curriculum that bridges the sciences, arts, humanities and social sciences. They learn to think critically and ask questions, review literature, gather and synthesize information to solve complex problems and communicate their findings effectively. Research is where students put their academic training into action, and today is when we see the benefits of the liberal arts on full display.

Research at Wilson is most often a student-initiated process, driven by individual intellectual curiosity and interest. Students conduct original research and explore their findings under the guidance of faculty advisers who also serve as mentors, encouraging students to contribute to the scholarly discussions in their fields. This student-faculty collaboration is a hallmark of the Wilson experience.

This year we have more than 170 students representing multiple disciplines presenting research covering a variety of topics. While the concurrent schedule makes it impossible to see all our presenters, I encourage you to explore your intellectual curiosities by attending as many presentations as possible.

Sincerely,

Elissa Heil
*Vice President of Academic Affairs, Dean of the Faculty*

# SCHEDULE OF EVENTS

## Lenfest Learning Commons: Oral Presentations
### JOHN STEWART MEMORIAL LIBRARY

| | |
|---|---|
| 8:50–9 a.m. | Welcome Address – **Barbara K. Mistick**, *president* |
| 9–9:50 a.m. | **Jaimi DeVitto '19** (p.10)<br>*Reflections of Grief* |
| | **Kiara Scarbrough '19** (p.11)<br>*Behind the Scenes of Society* |
| | **Donna Werling '21** (p.12)<br>*Feminist Selfies: Confessions of People Who Think Women Are People* |
| 10–10:50 a.m. | **Asia Prieto '19** (p.13)<br>*One Condition* |
| | **Noel Robinson '19** (p.14)<br>*Transformation of Self* |
| | **Evan Kelly '19** (p.15)<br>*Majoring in Citizenship: Political Engagement among College Students at Wilson and Beyond* |
| 11–11:20 a.m. | **Kyleen Enders '20** (p.16)<br>*Digital Art: Bringing Communities Together* |
| | **Elsa Zavala Hurtado '20** (p.17)<br>*Mi testimonio: Las Dificultades, Divergencia, Determination, and Dreams of an ELL Student* |
| 1:30–1:50 p.m. | **Amber Watkins '19**: Honors (p.18)<br>*Is Small Really Beautiful? Comparing the Experiences of Student Athletes of Color at Large and Small Primarily White Higher-Education Institutions* |

## Brooks Auditorium: Oral Presentations
**BROOKS SCIENCE CENTER**

8:50–9 a.m. Welcome Address – **Elissa Heil**, *vice president of academic affairs, dean of the faculty*

9–9:50 a.m. **Brady Byers '20** (p.19)
*Urban Tributaries and Their Effects*

**Mackenzie Bindas '19** (p.20)
*Alaskan Commercial Fishing Impact on Chinook Salmon*

**Jessica Larkin '19** (p.21)
*Cultivating a Resilient Marriage Through an Adaptive Management Plan*

10–10:50 a.m. **Taylor Sanford '19** (p.22)
*Daytime Sleepiness in Women with and Without PCOS*

**Katelynn Gilbert '19** (p.23)
*Short-term Characterization of a Biofilm in a Free-flowing Freshwater Creek in South-central Pennsylvania*

11–11:20 a.m. **Accounting 301: Auditing/Assurance Services**

*Jordan Belfort and Stratton Oakmont*
**Jarrett Rickerds '20, Jacob Brouse '21** (p.24)

*Gaithersburg Tax Preparer Indicted for Preparing False Tax Returns and Identity Theft*
**Robyn Whipple '20, Taylor Martin '20** (p.25)

1:30–2:20 p.m. **Accounting 301: Auditing/Assurance Services**

*Florida Landscaper Indicted for Tax Fraud*
**Sarah Manges '20** (p.26)

*Case Study: Theranos Inc. & Founder and CEO Elizabeth Holmes*
**Daizy Helman '20, Pratikshya Gaihre '21, Daphne Blair '22** (p.27)

*Environmental Protections and Fraud*
**Margaret Cramer '20** (p.28)

## Brooks Auditorium : Oral Presentations
**BROOKS SCIENCE CENTER**

2:30–3:40 p.m. **Evan Hoke '19:** Honors (p.29)
*Horror Inside*

**Zachary McMaster '19:** Honors (p.30)
*Analysis on the Effects of Pre-operative Physical Therapy on Range of Motion in Individuals Undergoing Total Knee Replacements*

**Heather Schuler '19:** Honors (p.31)
*The Effects of FDA Mandated Restaurant Menu Labeling on the Etiology of Anorexia Nervosa, Bulimia Nervosa, and Other Specified Eating Disorders*

**DISERT SCHOLAR**

3:45–4:15 p.m. **Elen Harutyunyan '19** (p.9)
*In the Shadow of 1915: Post Genocide Ethnic Preservation among Argentine-Armenians*

## Lenfest Learning Commons Plaza: Performance
**JOHN STEWART MEMORIAL LIBRARY**

11–11:50 a.m. **Classics 120: Classical Mythology** (p.32)
*Scenes from Ancient Greek Theater*

## Lenfest Learning Commons: Performance
**JOHN STEWART MEMORIAL LIBRARY**

11:40–11:55 a.m. **Dance 234/334: Performance Projects** (p.33)
**Samantha Heckendorn '20, Ashley Henderson '19, Lauren Monahan '21, Grace Wellmon '22**
*Dancing in a World of Change*

## Lenfest Lobby: Exhibition
**LENFEST COMMONS**

11:30 a.m. –1:30 p.m. **Classics 215: Women in Antiquity** (p.34)
*Encountering Ancient Women's History Through Everyday Objects: A Pop-Up Exhibition*

## Lenfest Lobby: Poster Session

**LENFEST COMMONS**

11:30 a.m.
–1:30 p.m.

**HSC 216: Human Anatomy and Physiology II** (p.35)

*Cirrhosis*
**Kassidy Hunt '22, Alyssa Keefer '21, Nicholas Kowalski '22, Hannah Myers '22, Taylor Tarabori '22, Amelia Fuentes Walquer '22**

*Chronic Obstructive Pulmonary Disease*
**Emma Carbaugh '22, Shelby Carbaugh '22, Jessica Eshelman '21, Baille Jones '22, Chelsea Scofield '22, Mirka Vasquez '22**

*Pancreatitis*
**Cierra Hartman '21, Olivia Hippensteel '22, Patrick Kruse '22, Justin Shipley '22, Makenna Snider '22, Pierce Thompson '22**

*Inflammatory Bowel Disease*
**MacKenzee Burkett '22, Marasol Equivia '22, Jessica Kosheba '22, Lori Lyncha '20, Emily Williams '22**

*Hashimoto's Thyroiditis*
**Rachel Bargo '22, Taylor Coffman '22, Siara Gossert '22, Kimberly Hale '22, Michelle Knox '22, Ophelia McDonald '22**

*Aplastic Anemia*
**Emily Lewis '22, Megan McMullen '22, Tioleaoauli Posiulai '22, Danielle Stafford '21, Cole Taylor '22, Hannah Zychal '20**

*Rheumatoid Arthritis*
**Trisha Barnes '22, Sierra Green '22, Cassandra Holt '22, Taylor Lamparter '22, Olivia McDonald '22, Olivia Wolford '22**

**PSY 352: Collaborative Research**

*Remembering to Remember: Prospective Memory in Older Adults*
**James Pasaribu '22** (p.36)

**CHM 398: Design and Methods of Scientific Research**

*Cytotoxicity Evaluation of Select Heavy Metals in Eyeshadows on Human Corneal Epithelial Cells*
**Abbey Heinbaugh '20** (p.37)

## Lenfest Lobby: Poster Session Continued

**LENFEST COMMONS**

### CHM 398

*The Effect of Genetic Availability of Serotonin Receptors on Chronic Stress Response in Zebrafish*
**Caylin Walp '20** (p.38)

*The Effects of Cannabidiol [CBD] on the Cortisol Levels of Rats after Exposure to an External Stressor*
**Julianna Price '20** (p.39)

### BIO 398: Design and Methods of Scientific Research

*Evaluation of Caffeine as an Alternative Treatment for Multiparous Holstein Dairy Cows Suffering from Ketosis*
**Rianon McKee '20** (p.40)

*Characterization of Beneficial Bacteria Produced in the Fermentation of Raw Food for Canines*
**Samuel Ritter '20** (p.41)

*Efficacy of Radiotherapy in Malignant Glioma Tumors When Delphinidin is Administered Before Radiation Exposure*
**Lauretta Birabwa '20** (p.42)

*Effects of Diets High in Saturated and Unsaturated Fatty Acids on Spatial Learning and Memory in Young Guinea Pigs, Cavia Porcellus*
**Julia Tabor '20** (p.43)

*Effects of Environmental Enrichment on Aggression in Swine*
**Mikayla Kutz '20** (p.44)

### BIO 306: Immunology (p.45)

*Anti-NMDAR Encephalitis*
**Lauretta Birabwa '20**

*Immune Response to the Treatment of Hemophilia A*
**Sardrick Owusu '19**

*Treatment of Systemic Lupus Erythematosus Using Allogeneic Mesenchymal Stem Cells*
**Carrie Stemple '20**

*The Influence of HLA Compatibility on Graft Survival After Heart Transplantation*
**Elsa Tabaku '20**

*The Prevention and Treatment of Equine Herpesvirus Myeloencephalopathy (EHM)*
**Julia Tabor '20**

**BIO 207: Vertebrate Physiology** (p.46)

*The Physiological Effects of Captivity on Animals*
**Amanda Aston '22**

*Effects of Exercise and Equipment on the Respiratory Health of Performance Equines*
**Taylor Baker '20**

*Sound Source Localization in Barn Owls (Tyto alba)*
**Elizabeth Hauck '19**

*The Evolution of the Yakutian Horse, Equus ferus caballus, and its Physiological Adaptations to Extreme Cold*
**Emma Holliday '21**

*Sonar and Echolocation in Wild Bottlenose Dolphins (Tursiops truncatus)*
**Megan Morningwake '21**

*Physiological Effects, Clinical Signs and Treatment of Stonefish (Synanceia) Envenomation*
**Jessica Morrow '20**

*Evaluating the Effects of Physical Activity on the Muscular System*
**Samuel Perrone '22**

*The Physiological Effects of Chemotherapy*
**Cheyenne Yoder '21**

**NUR 414: Nursing Leadership** (p.47)

*Optimizing Fluid Resuscitation in Septic Patients—Group 1*
**Chelsea Amsley '19, Kristin Smith '19, Heather Robinson '19, Deeana Martin '19**

*Family Benefits of Witnessing Cardiopulmonary Resuscitation—Group 2*
**Kierstyn Winslet '19, Garrett Cornman '19, Casey Ditch '19, Jenna Keller '19, Kaitlyn Risbon '19**

## Lenfest Lobby: Poster Session Continued

**LENFEST COMMONS**

*Decreasing the Occurrence of Catheter Acquired Urinary Tract Infections*
**Shannon Douglas '19, Elizabeth Parsell '19, Desiree Sorreno '19, Julia Nelo '19, Janelle Ford '19**

*Compassion Fatigue and Burnout: Prevention Strategies for the Novice Nurse Population*
**Brystol Rajtik '19, Brittany Younker '19, McKenzie Shank '19**

*Aromatherapy: A New Approach to Manage Pain and Anxiety in Hospital Patients*
**Brittany Paterno '19, Kayelynn Pittman '19, Cierra Rhodes '19**

*Preventing Falls in Hospitals*
**Shelby Fogus '19, Amanda Yost '19, Tracy Randall '19, Jennifer Laman '19, Cree Riley '19**

*Understanding Congestive Heart Failure: A Nursing Perspective*
**Morgan Bechtold '19, Chelsea Canova '19**

*How Music Medicine Helps Cancer Patients*
**Hannah Hartley '19**

*Complementary and Alternative Medicine (CAM) Therapies Compared to Pharmacological use in ADHD Children*
**Rachael Garland '19, Cathy Rice '19**

**SOC 401: Advanced Seminar**

*Gender Blender: How World Wrestling Entertainment Portrays Gender Norms and Stereotypes in Their Weekly Television Programming*
**Aaron Hoke '19** (p.48)

*Lesbians in your Living Room: The Liberatory Function of The L Word*
**Laura Wilson '19** (p.49)

**CLS 128: Introduction to Archaeology** (p.50)

*The Wilson College Fulling Mill Project: An Update*
**Ethan Kron '20, Bryony Tilzey '22, Anna Bavaro '21, Adrianne Markle '21**

## DISERT SCHOLAR PRESENTATION

### Elen Harutyunyan '19

**Majors**: Business Management, History and Political Science
**Minor**: Spanish
**Activities**: Field Hockey (2015-17), Learning Campus, Spanish Club

**Adviser**
Deborah Austin, Professor of Chemistry

## *In the Shadow of 1915: Post-Genocide Ethnic Preservation among Argentine-Armenians*

The barbaric events of the Armenian Genocide executed by the Ottoman Turks in 1915 not only left a permanent scar on the Armenian culture, but also created the modern Armenian diaspora. Carried out during and after World War I, the massacres and deadly deportations of the Armenian population resulted in over 1.5 million deaths. Indeed, many Armenians of the Ottoman Empire perished, but those who were not killed, or survived the death marches, rapes, physical mutilation and other tortures, managed to spread throughout the world.

As a direct result of genocide, the subsequent dispersion of survivors to the far reaches of the world created the modern Armenian diaspora. There are Armenian communities in more than 100 countries all over the world, including the Russian Federation, United States, France, Lebanon, Argentina, Canada and Republic of Iran, etc. For over a century, the widely spread Armenian communities developed in different ways, depending on the host countries and cultures.

The Armenian migration to Latin America took place between the 1920s and 1950s, and the community in Argentina is the largest and strongest Armenian diaspora in South America. This research will examine the impact of sociocultural trauma on the Argentine-Armenian community. It investigates the process of identity formation, development and preservation following the genocide. The project utilizes a variety of rich qualitative data collected in the summer of 2018, including interviews and ethnographic research, unraveling a complex relationship between the genocide and diasporic identity.

## ORAL RESEARCH PRESENTATION


### Jaimi DeVitto ’19

**Major**: Graphic Design
**Specialization**: Graphic Media

**Adviser**
Phillip Lindsey, Professor of Fine Arts


## *Reflections of Grief*

Grappling to understand my own personal grief and come to terms with the fact that I am not alone in losing a loved one, I decided to visualize my reflections of living with loss, sorrow and anxiety. I have come to realize that there are no time frames or protocols on grieving the death of a loved one. Loss is individualized to each mourner and is capable of being a revolving journey with varying emotions of unequal time frames.

As a graphic designer and photographer, I am interested in the utility of design, as well as the formal beauty and narrative power of the photograph. Together, these two disciplines offer a platform for me to explore the meaning and perception of grief—both mine and that of others. Images, whether graphically generated or captured through a lens, are a universal language and have the potential to resonate on a much deeper level than words alone. This body of work is intended to explore my perceptions of the revolving door of emotions the grieving experience after the death of a loved one.

Artists Barbara Kruger and Mike and Doug Starn have been important influences for me. They incorporate dynamic perspective, dramatic type and design fundamentals in a manner that create narratives invoking thought and reflection. Jessica Walsh is a graphic designer known for emotionally charged, concept-driven work that adheres to her concepts of beauty in forms. These artists and their works are significant to me and my development as a designer and photographer by giving me visual guidance on how design elements, within both photography and graphic design, can be used independently or combined to create a powerful image and message.

## ORAL RESEARCH PRESENTATION

### Kiara Scarbrough '19

**Major**: Studio Art, Business
**Minor**: Graphic Design
**Activities**: Art Department Work Study

**Adviser**
Phillip Lindsey, Professor of Fine Arts

## *Behind the Scenes of Society*

During my time at Wilson, I found that two artists have greatly influenced my work: Kiki Smith and Georgia O'Keefe. Both artists pushed boundaries and both made art that provoked viewers. Through their work, I was encouraged to push outside of my comfort zone and create artwork that could be considered controversial. I have been influenced by content from both artists, as well as Smith's materials and O'Keefe's color. Each has provided me with new ideas and views on the world.

The primary material I use in my work is acrylic on rectangular, easel-sized canvas. However, I also enjoy using found objects such as paper, glass, mirrors, glue and wire. Acrylic is my medium of choice because it dries quickly, can be applied to the canvas in a variety of interesting ways, and has tremendous potential for use with other materials. I use other commonly found objects to add additional layers of meaning. I apply paint with brushes, paper, rags, sponges, and with my hands.

My current body of work is designed to look at how society plays a major role in the development of people. We are taught, through a variety of social constructions (parents, public education, faith traditions and social media), how to see the world, label what is in front of us and live in our decided class. I want to encourage my viewers to think critically about these issues and always take a second look. I strive to create work that pushes the viewer out of their comfort zone and into the content and expression of the work. Through paint and found objects, I invite my audience to see the world in a new light.

## ORAL RESEARCH PRESENTATION

### Donna Werling '21

**Major**: Studio Art
**Minor**: Women's Studies
**Activities**: Foundry Member, Admissions Staff

**Adviser**
Phillip Lindsey, Professor of Fine Arts

### *Feminist Selfies: Confessions of People Who Think Women Are People*

I work with acrylic paint in saturated hues, which gives me the opportunity to explore expression and narrative as each piece represents my experience of place, time and subject. Raised in Baltimore, Maryland, and currently residing in Franklin County, Pennsylvania, my lifetime of experiences and continuing studies, which are now culminating in my studio art degree and minor in women's studies, brought forward a desire to emphasize that feminism is not a negative word.

My current subjects are those who understand the basic concepts of feminism and do consider themselves feminists. Through the presentation of *Feminist Selfies: Confessions of People Who Think Women Are People*, I hope to evoke an awareness in my assertion that being a feminist only means you believe that women should not be treated as "less than."

My creative process has been to ask those that consider themselves a feminist to send me a photograph, preferably a "selfie," which makes them feel good about themselves. Not necessarily one that makes them look attractive, but a photo that makes them feel good about who they are. Because women are usually the keepers of the family's story, they are not in many family photos. This makes turning these "selfies" into painted portraits a way to hold a women's place in that history. My intention with this body of work is to explore specific feminine identities and the social and political constructions that created them, while painting each participant as they prefer to be represented.

## ORAL RESEARCH PRESENTATION

### Asia Prieto '19

**Major**: English with Concentration in Creative Writing
**Activities**: Women in Need volunteer

**Adviser**
Michael Cornelius, Professor of English

## *One Condition*

"One Condition" is a collection of six short stories focused on the human condition through minor absurdity. The stories focus on characters faced with a peculiar situation that could not really exist within the realm of possibility. The stories focus on the genre of literary fiction, with the "one condition" in each story being a tool used to further explore the human condition. As a writer, I think stories help us to understand the different and sometimes unreal realities of life.

## ORAL RESEARCH PRESENTATION

### Noel Robinson '19

**Major**: English with Concentration in Creative Writing
**Minors**: Sociology, History

**Adviser**
Michael Cornelius, Professor of English

### *Transformation of Self*

"Transformation of Self" is a collection of short stories that focuses on black literary erotic fiction. In it, I hope to explore the complexities of being black and having interpersonal relationships in my characters' everyday lives. As an author, I feel that learning from one's mistakes and growing as a person is an important part of life, no matter how strong and confident one might be, and I hope that "Transformation of Self" could help my audience to realize how they can grow as individuals by embracing their own identities and then transforming others.

## ORAL RESEARCH PRESENTATION

### Evan Kelly '19

**Major**: History and Political Science
**Concentration**: Political Science
**Activities**: Fair Elections Center's Campus Vote Project Fellowship, Franklin County Legal Services Internship, Pi Gamma Mu

**Adviser**
Jill Hummer, Associate Professor of Political Science

### *Majoring in Citizenship: Political Engagement Among College Students at Wilson and Beyond*

Many scholars agree that college is a formative time for the development of students' political commitments and identities, which empowers them to participate in democratic processes and become more involved in their communities—to be engaged as citizens. Through mere observation, one might assume that the Wilson College campus is an atypical one, as it seems fairly apolitical being that it is absent of the political clubs, organizing and protests commonly associated with them. This mixed-method analysis relying on the qualitative findings of reviewed literature, including previous studies of other universities and quantitative data from surveys conducted on the Wilson campus, will attempt to determine if it is as apolitical as it appears to be, explain why or why not and how it compares to other colleges, and reconcile the differences.

## ORAL RESEARCH PRESENTATION


### Kyleen Enders '20

**Major**: Global Studies
**Activities**: Wilson Allies, Wilson Animal Action Group

**Adviser**
Nicolaos Catsis, Assistant Professor of Global Studies


## *Digital Art: Bringing Communities Together*


This essay explores digital art- creating art through digital mediums, such as graphic art- and its significance as a popular art medium in modern day. Digital art has various uses: entertainment, service, monetary, advertising, etc. It is an art medium that has grown over time and, with the help of social media, has since created a new-age community of artists from across the world. This type of art is not the only medium that has been as influential during its time. An example of a popular style, Japanese woodblock printing, is a type that has made a lasting impression on its society and the art community during the Tokugawa and Meiji periods. Looking into these specific case studies from the past allows us to analyze digital art as a community-builder and a new avenue for sharing and appreciating art.

## ORAL RESEARCH PRESENTATION


### Elsa Zavala Hurtado ’20

**Major**: Spanish, Education
**Activities**: Spanish Club (president), Learning Campus

**Adviser**
Amanda McMenamin, Associate Professor of Spanish


## *Mi testimonio: Las Dificultades, Divergencia, Determination, and Dreams of an ELL Student*

“Lo fácil ya lo hice, lo difícil lo estoy haciendo, y lo ‘imposible’ me tardaré, pero lo lograré.”

“I already did what’s easy, I’m still working on what’s difficult, and it will take a while to accomplish what is ‘impossible,’ but I will get there.”

-Unknown

Following the long tradition of the Latina testimonio in the Americas, “Mi testimonio” focuses on my experiences as an ELL (English Language Learner) student and the concomitant difficulties that I have faced. As I recount my testimony, in which I describe my roots, my education in the United States and moreover, the struggles that I faced while acculturating to that education system, I pair these experiences with scholarly research on the subject of bilingual education and the hardships that ELL students encounter when learning a new language. As such, I argue that ELL students tend to have a more difficult time when entering the U.S. school system, confronting a new culture and language. Nonetheless, with the proper support network and pedagogical orientations, these students can prosper in the U.S. classroom. In order to achieve this, it is very important that teachers and students work cooperatively and dialogically to increase learning and decrease discrimination in the classroom.

## HONORS RESEARCH PRESENTATION

### Amber Watkins '19

**Major**: Sociology
**Minor**: Business
**Activities**: Basketball, Academic Support Center tutor

**Adviser**
Julie Raulli, Professor of Sociology

***"Is Small Really Beautiful? Comparing the Experiences of Student-Athletes of Color at Large and Small Primarily White Higher Education Institutions"***

Student-athletes face many challenges balancing their dual roles in college. Student-athletes of color at Primarily White Institutions (PWIs) face additional challenges navigating the demands of schoolwork and sports due to racial stereotypes that often pervade campus culture. Previous studies at large PWIs have found that student-athletes of color experienced not being treated like their white peers, being expected to do poorly on academic work, and hearing demeaning racial comments on campus. This study examines whether the size of a PWI matters to student-athletes of color by exploring their experiences on and off the court at a small college.

## ORAL RESEARCH PRESENTATION


### Brady Byers '20

**Major**: Environmental Sustainability
**Minor**: Philosophy

**Adviser**
Ed Wells, Professor of Environmental Science


### *Urban Tributaries and Their Effects*

This study will investigate the effect that urban tributaries have on larger bodies of water—more specifically, the effects of urban tributaries in Hagerstown, Maryland, on the Antietam Creek. The tributaries themselves will undergo chemical tests for dissolved oxygen, nitrates and phosphate. This study will also compare the bacteria found in water throughout different types of communities. Both E.coli and enterococci levels will be tested and compared to determine the differences between rural and urban water systems in Chambersburg, Pennsylvania, and Hagerstown, Maryland. I hypothesize that the rural water will contain higher levels of both E.coli and enterococci due to runoff from neighboring farms and fields. The lack of farmland in the urban areas will produce lower levels of bacteria and could very well result in safer, cleaner drinking water.

## ORAL RESEARCH PRESENTATION


### Mackenzie Bindas '19

**Major**: Environmental Sustainability
**Minor**: Political Science
**Activities**: Field Hockey

**Adviser**
Ed Wells, Professor of Environmental Science


### *Alaskan Commercial Fishing Impact on Chinook Salmon*

In Alaska, oil drilling, tourism and fishing are the three largest export industries. When many of us think of Alaska, images of breathtaking scenery, abundant wildlife, frigid temperatures and long, dark winters come to mind. The Chinook salmon is the largest species of salmon in the Pacific regions, but is more commonly known as "king" salmon and is the state fish of Alaska. Over the past 30 years, the Chinook salmon population has declined about 400,000 since the 1980s due to an influx of overfishing, habitat loss and degradation, and climate change. In some areas of Alaska, Chinook populations are increasing and normal while in other areas such as the Kenai River, they are decreasing rapidly. Chinook salmon run downriver or migrate toward the ocean, where they spend three to five years interacting with one another; then go back upriver to lay their eggs before once again swimming out to the ocean. The main problem occurs when the salmon are out at sea and commercial fishermen catch a large sum of the population, and subsequently deplete fish stock in the rivers. Commercial fishing boats are allotted a certain limit on how much they can catch so that harvests do not deplete the base fish population. The analysis of the commercial fishing industry of Chinook salmon is based on government statistics and scholarly journals, as well as personal interviews with fishing boat captains. This research project will conclude with recommendations that will help ensure the Alaskan fishing industry continues to prosper, while ensuring the health of river and ocean ecosystems for the chinook, as well as other fish populations.

## ORAL RESEARCH PRESENTATION


### Jessica Larkin '19

**Major**: Sustainable Studies
**Minor**: Sociology

**Adviser**
Ed Wells, Professor of Environmental Science


## *Cultivating a Resilient Marriage Through an Adaptive Management Plan*

What do we know? Where do we want to go? How do we get there? Who can help us get there?

Indeed, these are heavy questions. But they yield imperative answers, especially if there is a desire to flourish and abstain from stagnation. Is this not what we should all strive to do?

Well, this is exactly what Fulton Farm wants to do, guided by the holistic principles of the Ecological Perspective, which states that the people and the environment are a holistic system, and stresses the need to understand how person(s) and the environment interact. The goal of all of this is to improve the experiences, the relationships of others and the environment.

What became of this rabbit hole was an acknowledgement that Fulton Farm needs to shift its focus. It needs to right itself in order to honor what it is now known it needs to; you, the community.

What will be presented to you is my culminating experience of everything that I have accomplished and worked toward, both academically and professionally, since my time at Wilson College. In short, this harmonious body of work explores Fulton Farm's shift to permaculture, a change in production, and its focused pursuits in cross-pollination through service learning.

Faculty members will walk away with a better understanding of how they can integrate service-learning components into their courses. Emphasis will be placed on the utilization of Fulton Farm and the local food system. It is my hope that all will leave with the desire to expand the walls of the classroom and to encourage cross-pollination, so that your life, student's lives, are enriched via hands-on experiences.

So, come with me on a journey that has you as a muse and our farm, our community, as a playground and muse for personal for discovery, education and connection. Let the spirit of cross-pollination take hold and prosper!

## ORAL RESEARCH/POSTER PRESENTATION

### Taylor Sanford '19

**Major**: Psychology
**Activities**: Psychology Club, Learning Campus Club, Allies

**Adviser**
Steven Schmidt, Assistant Professor of Psychology

## *Daytime Sleepiness in Women with and without PCOS*

This study shows how tired women with and without polycystic ovarium syndrome (PCOS) are on a daily basis and to bring awareness of PCOS and to understand daytime sleepiness. Five to 10 percent of women are affected by PCOS and often go undiagnosed (Fogel, 2001). It is hypothesized that women with PCOS show more signs of daytime sleepiness than women without PCOS. The study included women from a PCOS support group online known as the PCOS Awareness Association for the control group, and the faculty and students of Wilson College who took a survey and answered text messages regarding how tired they were. The hypothesis was correct: women with PCOS are indeed more tired than women without PCOS in all. The PCOS group reported most likely to fall asleep after taking the survey and reported to be more tired than the control group.

## ORAL RESEARCH PRESENTATION


### Katelynn Gilbert '19

**Major**: Biology

**Advisers**
Deborah Austin, Professor of Chemistry
M. Dana Harriger, Professor of Biology


### *Short-term Characterization of a Biofilm in a Free-flowing Freshwater Creek in South-central Pennsylvania*


Previous research has been conducted on the relationship between bacteria and algae within lakes, and demonstrated a positive correlation between bacterial growth and algae mats as a type of biofilm. Biofilms are heterogeneous mixtures of microorganisms such as bacteria and algae that are held together by Extracellular Polymeric Substance (EPS). A free-flowing, freshwater system is a unique environment in comparison to a stagnant system. Many environmental factors can impact the aquatic system as it proceeds downstream from the headwaters. This then affects biofilm growth within the system to varying degrees. The purpose of this study was to characterize populations of microorganisms within a biofilm collected from a creek, and determine how the growth of those organisms was affected over time and with temperature changes. Five sample sites were used along the Conococheague Creek in south-central Pennsylvania, beginning 11.9 kilometers from the headwaters and ending 29.6 kilometers downstream from the headwaters. The factors examined in this experiment included ambient air and water temperature, Gram-positive and negative bacteria, and photosynthetic autotrophs within the biofilm. Sampling was performed at each site on three days over a two-week period in November 2018. Three sub-samples of biofilm were collected at each site, one from each edge of the creek and from the middle. Data indicates that a common genus of algae between the five sites was *Closterium*, while points further downstream had genera of cyanobacteria that were not as prevalent in the headwaters, such as Lyngbya. Initial analysis indicates that over the course of the study, photosynthetic organism populations were more greatly affected by temperature than bacterial populations. Statistical analysis is ongoing to determine whether there is significance between or trends evident among experimental parameters.

## ORAL RESEARCH PRESENTATION


### Jarret Rickerds '20

**Major**: Accounting
**Minor**: Sports Management
**Activities**: Men's Soccer, Baseball, Curran Scholar, Phoenix Leader

### Jacob Brouse '21

**Major**: Accounting
**Minor**: Small Business Management
**Activities**: Young Life Leader, Chambersburg Rod and Gun Club, AAU Basketball Coach

**Adviser**
Joseph Crouse, Assistant Professor of Business and Economics


## *Jordan Belfort and Stratton Oakmont*

The purpose of this case study is to demonstrate the techniques used by Stratton Oakmont to defraud and take advantage of investors. This study will also take an in-depth look at how Belfort was able to manipulate stock prices and earn large profits off the backs of investors. Lastly, we will discuss the steps that the Federal Bureau of Investigation took to bring justice and the resulting punishments for this criminal activity.

Jordan Belfort founded Stratton Oakmont, a franchise that sold and marketed penny stocks. He defrauded investors through a process known as "pump and dump". This is where a stock price is artificially inflated through positive but misleading and fraudulent claims. These stocks were sold at an inflated price and once sold, Stratton Oakmont would dump its shares. This resulted in a collapse of the stock price and investors losing everything. It is estimated that Stratton Oakmont defrauded 1,500 investors for over $200 million. In 1999, Belfort was indicted for securities fraud and money laundering. He would spend nearly 22 months in jail and was ordered to repay around $110 million.

## ORAL RESEARCH PRESENTATION


Robyn Whipple '20
**Major**: Accounting
**Minor**: Business

Taylor Martin '20
**Major**: Accounting

**Adviser**
Thomas Armstrong, Assistant Professor of Finance


### *Gaithersburg Tax Preparer Indicted for Preparing False Tax Returns and Identity Theft*

The purpose of this case is to demonstrate how committing fraud and identify theft can affect an innocent tax payer through the unethical and illegal and actions of a corrupt tax preparer.

A Gaithersburg Tax Preparer was responsible for one count of mail fraud and one count of aggravated identity theft. Maria Espinal, the tax preparer, "allegedly prepared and filed fraudulent tax returns on behalf of her taxpayer-clients with both the IRS and the Comptroller of Maryland" (Gaithersburg Tax Preparer, 2019). Maria manipulated clients' W-2 forms in order to generate an unauthorized tax refund that was not owed to them. If convicted, Maria will be facing a maximum sentence of three years for each count of aiding and assisting in false returns, 20 years in prison for each count of mail fraud, and a minimum sentence of two years for identity theft.

## ORAL RESEARCH PRESENTATION

Sarah Manges '20
**Major**: Accounting

**Adviser**
Joseph Crouse, Assistant Professor of Business and Economics

### *Florida Landscaper Indicted for Tax Fraud*

The reason for this case study is to determine whether the consequences given were according to the crime or not. Over the period during which the fraudulent acts were occurring, does the punishment fit the crime?

For five years, Joseph J. Ferry III understated the total income earned for his company and himself during the 2012-2016 tax years. He was charged with five accounts. However, he was also allegedly charged with spend $2.9 million of corporate funds on personal expenses. I plan to look at the consequences that he might face and then compare them to three other cases along the same lines. It will be an analysis of the top three cases over the past 10 years to see if the time differences affect the punishments set in place. I am hypothesizing that time will not be a big variable on the punishments.

## ORAL RESEARCH PRESENTATION

Daizy Helman '20
**Major**: Accounting

Pratikshya Gaihre '21
**Majors**: Accounting,
Financial Mathematics

Daphne Blair '22
**Major**: Accounting

**Adviser**
Joseph Crouse, Assistant Professor of Business and Economics

### *Theranos Inc. and Founder and CEO Elizabeth Holmes*

The purpose of this case study is to evaluate findings of defrauding investors of millions of dollars and defrauding doctors and patients while acting unethically and irresponsibly.

Founded in 2003 by then-19-year-old Elizabeth Holmes, Theranos Inc. raised more than $700 million from venture capitalists and private investors, resulting in a $10 billion valuation at its peak in 2013 and 2014. Investors and the media hyped Theranos Inc. as a revolution in the large blood-testing market, where the U.S. diagnostic lab industry posts annual sales of over $70 billion. Theranos Inc. claimed its technology was groundbreaking and that its tests required only about 1/100 to 1/1,000 of the amount of blood that would ordinarily be needed and cost far less than existing tests.

A turning point came in October 2015, when the company faced a string of legal and commercial challenges from medical authorities, investors, the U.S. Securities and Exchange Commission (SEC), Centers for Medicare and Medicaid Services (CMS), state attorneys general, former business partners, patients and others. By June 2016, it was estimated that Holmes' personal net worth had dropped from $4.5 billion to virtually nothing. The company was near bankruptcy until it received a $100 million investment from Fortress Investment Group in 2017. In September 2018, the company ceased operations.

ORAL RESEARCH PRESENTATION

Margaret Cramer '20
**Major**: Accounting

**Adviser**
Joseph Cunningham, Associate Professor of Accounting

## *Environmental Protections and Fraud*

The purpose of this case is to draw a relation between EPA laws and criminal behavior to commit fraud to meet these standards.

The former CEO of Volkswagen committed fraud by running a scheme to cheat U.S. diesel vehicle emissions requirements. Volkswagen deceived regulators for years. Winterkorn, the former CEO, is still being investigated.

## HONORS RESEARCH PRESENTATION

### Evan Hoke '19

**Major**: Creative Writing
**Minor**: Communications
**Activities**: Men's Volleyball, Campus Activities Board (president), Allies Club, Student-Athlete Mentor

**Adviser**
Michael Cornelius, Professor of English

## *Horror Inside*

*Horror Inside* is a full-length collection of short stories that focuses on speculative fiction as a means of evoking a reaction in the reader, whether good or bad. In it, I hope to explore internal fears, conflicts and traumas that people typically reject or choose to ignore. As an author, I, too, have thoughts and feelings that I push aside and try to forget about, and I hope that *Horror Inside* can help my audience to recognize and confront such feelings in relation to my stories.

## HONORS RESEARCH PRESENTATION


### Zachary McMaster '19

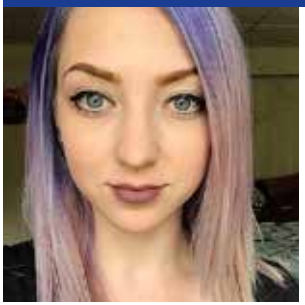
**Major**: Exercise and Biological Science

**Advisers**
M. Dana Harriger, Professor of Biology
Tonia Hess-Kling, Assistant Professor of Exercise and Sports Science


***Analysis of the Effects of Pre-operative Physical Therapy on Range of Motion in Individuals Undergoing Total Knee Replacements***


There are approximately 800,000 total knee replacement (TKR) procedures performed annually in the United States. This number is projected to increase to 3.48 million per year by 2030. This study investigated knee range of motion of patients at various time points after TKR surgery, as well as the total number of visits required to regain full range of motion at the knee. One group of patients underwent pre-operative physical therapy, while the other group only had post-operative physical therapy. By strengthening the quadricep muscle before surgery, less atrophy may occur. The atrophy can occur due to a condition known as muscle inhibition. Having a stronger quadricep going into surgery may result in fewer post-operative physical therapy visits. Under the guidelines of Health Insurance Portability and Accountability Act (HIPAA) and Institutional Review Board (IRB) regulations, data regarding age, body mass index, knee range of motion, and clinical visits at Waynesboro Physical Therapy and Sports Medicine and its affiliates for patients who underwent a TKR in the previous five years was collected. When analyzing the data, an ANOVA and t-test will be most useful in determining the significance of differences between the groups. Analysis will also include the difference in knee range of motion at one-week post-op. A comparison of interest includes examination of BMI as it relates to the number of visits needed for pre-operative physical therapy and post-operative physical therapy vs. solely post-operative physical therapy. Preliminary data indicates that patients who undergo physical therapy prior to surgery typically have better outcomes after TKR surgery.

## HONORS RESEARCH PRESENTATION



### Heather Schuler '19

**Major**: Psychology
**Concentration**: Women's Studies
**Activities**: Psychology Club

**Adviser**
Steven Schmidt, Assistant Professor of Psychology

***The Effects of FDA Mandated Restaurant Menu Labeling on the Etiology of Anorexia Nervosa, Bulimia Nervosa, and Other Specified Feeding and Eating Disorders***

New Food and Drug Administration (2014) regulations will require restaurants to post caloric content of food items directly on the menu by May 2018. The intention is to encourage healthier eating habits through awareness (2015); however, some research (Haynos and Roberto, 2016) suggests that the regulations may harm individuals suffering from eating disorders by exposing them to information that heightens urges to engage in eating-disordered behaviors. The present study aims to further knowledge by examining the relationship between exposure to calories on menus and eating-disordered symptom reports. Participants with diagnoses of anorexia nervosa, bulimia nervosa or other specified feeding or eating disorder (OSFED) will report disordered urges and thoughts several days before a hypothetical restaurant meal and again immediately after being asked to make a genuine meal choice from a hypothetical menu. It is hypothesized that the group who is exposed to the calorie counts will report more disordered behavior urges, greater body dissatisfaction and higher anxiety about food and weight. The findings in this study will be useful in understanding how the proposed regulations may potentially impact individuals with eating disorders.

## PERFORMANCE

### Classics 120: Classical Mythology
### *Encountering Ancient Women's History through Everyday Objects: A Pop-Up Exhibition*

Savannah Bell-Bussler '22, Hunter Cheek '22, Josef Cofer '22, Natalie Cowdrick '22, Karen Fruehwirth '21, Brianna Gearhart '21, Samantha Hall '22, Megan Hamman '22, Samantha Hayhurst '22, Eric Holz '22, Shealyn Holzinger '22, Armani Johnson '21, Daeshaun Johnson '22, Katelin Kane '22, Delaney Kegel '22, Patricia Mari-Marquez '21, Adrianne Markle '21, Carter Marsh '22, Megan Morningwake '21, Kelsey Novak '20, Oliver Perry '20, Brooke Pottorff '20, Krista Rumpff '22, Montana Scott '22, Baylen Snyder '22, Stephanie Sparagna '19, Jocelyn Struble '20, Lexie Tanger '20, Emily Torres '22, Celine Vogelsong '20

**Adviser**
Bonnie Rock-McCutcheon, Lecturer of Classics

One of the most enduring cultural experiences from the ancient world is the theater. Ancient Greek and Roman plays continue to be performed and reworked today, even though they are over 2,000 years old. Join students from CLS 120: *Classical Mythology* as they present scenes from ancient Greek plays. As part of this project, students created masks, costumes and props. Students were also responsible for the choice of scenes, as well as all blocking and staging. Sit back and enjoy the show!

## PERFORMANCE


### Dance 234/334: Performance Projects
***Dancing in a World of Change***

Samantha Heckendorn ’20, Ashley Henderson ’19, Lauren Monahan ’21, Grace Wellmon ’22

**Adviser**
Megan Mizanty, Assistant Professor of Dance

*Performance Projects* is an advanced dance course exploring choreography, production and performance. Students will present excerpts of their dances from class. Topics explored include: site-specific dance, dance and technology, dance partnering and solo/duet/trio performances.

EXHIBITION

## Classics 215: Women in Antiquity
## *Encountering Ancient Women's History through Everyday Objects: A Pop-Up Exhibition*

Luis Gonzalez Ayala '21, Marleigh Belk '21, Hannah Clark '21, Margaret Cramer '20, Christina Dobbins '22, Makayla Foor '20, Michaela Funk '21, Evan Hoke '19, Caitlin Huffman '20, Armani Johnson '21, Kathryn Leese '22, Christyann Long '20, Arianne Moreno '19, Amanda Peterson '23, Amisha Rijal '19, Chloe Sprecher '21, Cheyenne Swope-Stitt '19, Celine Vogelsong '20, Kyleen Enders '20, Kai Wyatt '22

**Adviser**
Bonnie Rock-McCutcheon, Lecturer of Classics

We encounter endless objects throughout our daily lives, yet rarely stop to consider the stories that those objects could tell. Students of CLS 215: *Women in Antiquity* have each researched an everyday object from the Wilson College Classics Collection, with an eye toward understanding what each can tell us about women's lives in ancient Greece and Rome. Those objects and their research are featured at this exhibition as we share these objects with the Wilson College community.

## POSTER RESEARCH PRESENTATION

# HSC 216: Human Anatomy and Physiology II

*Cirrhosis*
*Chronic Obstructive Pulmonary Disease*
*Pancreatitis*
*Inflammatory Bowel Disease*
*Hashimoto's Thyroiditis*
*Aplastic Anemia*
*Rheumatoid Arthritis*

**Adviser**
Tonia Hess-Kling, Assistant Professor of Exercise and Sports Science

Students of HSC 216: Human Anatomy and Physiology II round out their two-semester course studying human anatomy and physiology with a culminating group research project. This project is aimed at creating an active and student-centered learning environment, while also educating students on how to conduct research in the field. During their experience, groups conduct research on a myriad of factors related to a chronic disease, including, but not limited to: causation, cellular, anatomical and/or physiological adaptations, and current diagnostic and therapeutic methods. The overall goal of this project is to encourage and enhance a deeper understanding of chronic disease and what consequences occur within the body locally or systemically. Group posters will reflect knowledge gained through this experience and will serve as a platform to convey pertinent facts and concepts to the community; therefore, raising general awareness.

## POSTER RESEARCH PRESENTATION

### James Pasaribu '22

### *Remembering to Remember: Prospective Memory in Older Adults*

**Adviser**
Keri Kytola, Assistant Professor of Psychology

*Prospective Memory* (PM) allows us to remember to buy groceries on the way home or to take medication on time (Einstein and McDaniel, 1990; Harris, 1984). PM is essential for everyone, but especially older adults because forgetting to carry out routine tasks like buying groceries or taking one's medication can range from being inconvenient to life threatening. Thus, in order for older adults to remain independent in late life as PM declines (Henry, MacLeod, Phillips and Crawford, 2004), it is crucial to understand how different factors affect PM performance. To better understand which factors are related to and predictive of PM performance, 118 (74 female, 44 male) healthy, community-dwelling older adults (*Mage* = 72.36, *SD* = 7.50) who indicated English as their first language participated in this study. All participants completed a lexical decision task (LDT) in which they were told to decide whether strings of letters were English words or non-words by pressing the keys 'YES' and 'NO' on the keyboard. The PM task was embedded within the LDT, which required participants to press the 'F6' key whenever they saw the word *goat* (focal condition) or any word that represented an *animal* (nonfocal condition) presented during the LDT. Participants also completed several other memory tasks and a few short questionnaires as part of the study. It was hypothesized that focality would be strongly correlated with PM performance and that participants in the focal condition would outperform those in the nonfocal condition. It was also hypothesized that cognitive inhibition abilities, as well as working memory span would be strongly correlated with and predictive of PM performance above and beyond focality such that participants who had better cognitive inhibition abilities and greater working memory span would outperform those who did not. These hypotheses were supported and closely replicated in past PM literature among older adults (Henry et al., 2004; Ihle, Hering, Mahy, Bisiacchi and Kliegel, 2013; Kliegel, Jäger and Phillips, 2008; McDaniel and Einstein, 2007), suggesting that completing easier tasks (e.g., focal) when possible and successfully inhibiting other tasks/distractions can lead to better PM performance in late adulthood.

## POSTER RESEARCH PRESENTATION

Abbey Heinbaugh '20

### *Cytotoxicity Evaluation of Select Heavy Metals in Eyeshadows on Human Corneal Epithelial Cells*

**Advisers**
Deborah Austin, Professor of Chemistry
Kathryn Sarachan, Assistant Professor of Chemistry

Due to limited regulations and guidelines for the cosmetics industry, there is growing consumer concern regarding the safety of these products. Previous studies have been performed that demonstrate the presence of toxic substances in cosmetics. Therefore, the first aim of this dual phase research project is to quantify the concentrations of lead, chromium and nickel in eyeshadows manufactured in the United States using Flame Atomic Absorption Spectroscopy. Since previous studies have quantified metals in eyeshadows, similar results should be demonstrated in this research. Additionally, the cytotoxicity of lead, chromium and nickel will be evaluated using human corneal epithelial cells to simulate corneal exposure to eyeshadows that contain lead, chromium and/or nickel. It is predicted that the metals will decrease cell viability due to their known toxic effects in biological systems.

## POSTER RESEARCH PRESENTATION

Caylin Walp '20

### *The Effect of Genetic Availability of Serotonin Receptors on Chronic Stress Response in Zebrafish*

**Advisers**
Kathryn Sarachan, Assistant Professor of Chemistry
Brad Engle, Associate Professor of Biology

This project will focus on the link between chronic stress and scarcity of serotonin receptors in the brain of Zebrafish. Zebrafish are currently the accepted model for serotonin and dopamine-linked mental illness in humans, as mammalian models perish within hours of birth due to respiratory distress as a result of disrupting serotonin pathways in the brain. Wild-type Zebrafish and genetically altered Zebrafish predisposed to a paucity of serotonin receptors on neuron surfaces were raised from birth until adulthood in parallel environments in Wilson's lab setting. These groups of fish were then exposed to constant stress and relief periods over the course of two weeks. Both groups were then sacrificed to quantify mRNA copies for serotonin transporters, which arise from a positive feedback mechanism initiated by reception of serotonin by substrate specific receptors on the surface of their neurons. Western blots were performed between the groups to test for presence of transporters in both genetic variants, and RTqPCR performed to quantitate receptor amounts in each of the respective groups receiving treatment, as well as the control group subjected to no external stressors.

## POSTER RESEARCH PRESENTATION

Julianna Price '20

### *The Effects of Cannabidiol [CBD] on the Cortisol Levels of Rats after Exposure to an External Stressor*

**Advisers**
Kathryn Sarachan, Assistant Professor of Chemistry
Deborah Austin, Professor of Chemistry

CBD is a non-psychoactive compound found in the cannabis plant that interacts with CB1 and CB2 receptors found to have anxiolytic effects in both human patients and rat models (Reggio P. H. 2010; Goldenberg, Reid, IsHak and Danovitch, 2017). Male lister-hooded rats split into four groups of eight will be exposed to an intraperitoneal injection. Two groups will be placebo groups and two will receive the CBD. One group will receive injections daily over a period of 14 days, with the other receiving only one injection of CBD in order to determine if either a one-time use produces a desired result or if a daily injection is more beneficial. Placebo groups will be injected with a saline solution.

All groups will be subjected to an external stressor test using Light/Dark Emergence Testing. Salivary cortisol levels will be measured using an ELIZA test four times throughout the study—once upon arrival at Wilson, once prior to exposure to the external stressor, directly after exposure, and again a few hours later. Rats will be exposed to an external stressor one time. Other direct measures of stress including heart rate and time spent in the dark room will be monitored to confirm that the rats are experiencing stress. I am hypothesizing that CBD will decrease cortisol levels in comparison to non-CBD-treated mice after exposure to the stressor. I also hypothesize that a daily injection of CBD will be more effective in lowering cortisol levels than a one-time treatment with CBD. The current controversy of CBD use as an effective alternative to popular medicine marks the importance of a study such as this. If CBD is found to be helpful in the male-lister hooded rat, this may open the discussion as to the possibilities of using CBD to treat other animals and even humans for anxiety/stress disorders.

## POSTER RESEARCH PRESENTATION

Rianon McKee '20

### *Evaluation of Caffeine as an Alternative Treatment for Multiparous Holstein Dairy Cows Suffering from Ketosis*

**Advisers**
M. Dana Harriger, Professor of Biology
Brad Engle, Associate Professor of Biology

Ketosis in dairy cows is recognized as one of the most prevalent metabolic disorders that not only negatively affects the animal's health, but also its milk production, which in turn creates a negative economic impact. A cow in ketosis produces 1-10 fewer liters of milk per day, has a decreased fertility rate, and has an increased risk of a displaced abomasum. It is estimated that a single case of subclinical ketosis results in a $78 loss. With 40% of dairy cows suffering from this disorder at least once during lactation, that $78 deficit multiplies quickly. Traditionally, the treatment for ketosis includes drenching the animal with propylene glycol or administering an intravenous glucose therapy, which can be expensive and as of March 2019, dairy farmers are only receiving $0.07-$0.42 per 100 gallons of milk. Therefore, treating all animals in a ketotic state is uneconomical. As an alternative treatment, caffeine appears to alleviate the symptoms of ketosis; however, studies have not been conducted to determine a correlation between the two. Caffeine appears to stimulate appetite and gastrointestinal activity, allowing the GI system to obtain normal function and help combat the effects of ketosis. The purpose of this study is to determine if caffeine, in the form of brewed coffee grounds, can be used as an alternative treatment for subclinical ketosis in Holstein dairy cows. Blood samples will be collected from symptomatic cows pre- and post-treatment with coffee grounds to monitor the ketone body beta-hydroxybutyric acid (BHBA), a quantitative indicator of ketosis. Milk samples will also be collected and analyzed for ketone content. Based on observations from multiple veterinarians within the American Association of Bovine Practitioners who have treated ketotic cows with coffee grounds, I predict that caffeine will decrease BHBA levels in the animals' blood, therefore indicating that caffeine may be an alternative treatment for Holstein dairy cows in subclinical ketosis.

## POSTER RESEARCH PRESENTATION

Samuel Ritter '20

### *Characterization of Beneficial Bacteria Produced in the Fermentation of Raw Food for Canines*

**Adviser**
M. Dana Harriger, Professor of Biology

Americans have become increasingly aware of healthy nutrition and have been transitioning from a diet of processed, chemically modified foods to a diet of fresh, minimally processed foods, supporting the "farm to table" natural approach to healthy eating. Currently 36 % of U.S. households have dogs as pets, and although the household may have switched to a healthier diet, they may not be considering their dog. The U.S. dog food industry is an $ 11.6 billion annual business with most producing dry kibble, with many brands claiming to be nutritionally balanced and healthy. However, it is estimated that 96% of dogs show signs and/or suffer from ailments related to a lack of proper nutrition. The current conventional dry kibble that most pet dogs are fed does not necessarily deliver the nutritional needs for most canines. While manufacturers add more than enough essential nutrients, vitamins and minerals, the dehydration and extrusion processes chemically modify the nutrients, rendering them unable to be digested and diminishing their bioavailability for absorption. Thus, only 3.4% of dogs obtain their basic caloric requirements. However, a naturally fermented raw diet not only contains the necessary vitamins and nutrients, but also many natural microbes needed in the gut to aid in the digestion and absorption of many of these nutrients. Answers Pet Food is currently one of the few pet food companies that produces a fermented raw diet. Fermentation produces beneficial bacteria to establish and maintain a healthy gut biome. This study will be conducted in collaboration with Answers Pet Food of Fleetwood, Pa., to investigate the length of fermentation on the microbial population in its food. Bacterial enumeration and characterization will be conducted at various intervals of the fermentation process. Results of this study will add to the body of data utilized by Answers Pet Food to establish a stable microbiome that is nutritionally healthy for the dog.

## POSTER RESEARCH PRESENTATION

Lauretta Birabwa '20

### *Efficacy of Radiotherapy in Malignant Glioma Tumors when Delphinidin is Administered before Radiation Exposure*

**Advisers**
Brad Engle, Associate Professor of Biology
Deborah Austin, Professor of Chemistry

Delphinidin is an anthocyanin, a water-soluble phytopigment found in fruits and vegetables, that provides healthy immune benefits (Delphinidin). It is known to stimulate apoptosis through caspase activation. It is an antioxidant that acts against oxygen-contained free radicals, thus deregulating inflammatory responses (Goszcz). The motive of the experiment is to increase efficacy of radiotherapy after delphinidin pre-treatment of glioma cells. U-118 mg cells are desensitized with delphinidin, which is dissolved in DMSO to penetrate the cell membranes. Delphinidin will inhibit cancer cell proliferation, which will pave way for radiation to target only the existing cancer cells. With successful treatment of the U-118mg cells, cancer regression is expected. In the probable event some glioma cells survive, the cells will be desensitized with minimal dose of delphinidin to stimulate apoptosis of the glioma cells. With the cells being outnumbered, the healthy cells will be able to combat them.

## POSTER RESEARCH PRESENTATION

Julia Tabor '20

### *Effects of Diets High in Saturated and Unsaturated Fatty Acids on Spatial Learning and Memory in Young Guinea Pigs, Cavia porcellus*

**Adviser**
M. Dana Harriger, Professor of Biology

This study will determine whether diets supplemented with high levels of saturated and unsaturated fatty acids (UFAs) may affect spatial learning and memory in Cavia porcellus under the age of six months. This study allows owners to gain knowledge of the ingredients and compounds found in the food and how it affects them cognitively. Fatty acids are important components of myelin sheaths and neuronal cell membranes, which may over time enhance a variety of physiological functions, including neural transmission and synaptic plasticity. This aspect may be very important in the cognitive development of young guinea pigs. Guinea pigs will be divided into three treatment groups and maintained on a control diet. The diet will be supplemented with natural sources of saturated fatty acids or UFAs. The experimental procedure will last for several weeks and will include an assimilation period followed by a cognition test. The cognition test will include a learning phase to assess spatial learning and a memory test. Blood samples will be collected periodically throughout the experiment to determine plasma levels of fatty acids and cortisol. It is expected that animals receiving the diet enriched with UFAs will show improvement in spatial learning and memory, compared with the saturated fatty acid and control groups.

## POSTER RESEARCH PRESENTATION

Mikayla Kutz '20

### *Effects of Environmental Enrichment on Aggression in Swine*

**Adviser**
Deborah Austin, Professor of Chemistry

Aggression is a common behavior exhibited by many animal species. When a species is in its natural environment, this behavior is not commonly exhibited, but when in captivity, this behavior can progress to become a problem in the animal's environment. Aggressive behaviors can result in injuries to other animals or their handlers. Enrichment has the potential to reduce aggression by promoting the natural behavior of a species and improve their well-being by encouraging exercise using various objects in their environment. Environmental enrichment promotes a species' natural behavior and can lead to a safer and calmer environment. One species where aggressive behavior is common is swine. The enrichment objects that will be used will be a puzzle ball with no reward and a puzzle ball with a reward inside. These objects will be placed in the appropriate pen with the pigs. There will be a control group with no enrichment, a group with an enrichment object, and a group with an enrichment object that contains a reward. The behavior that the pigs exhibit at various points throughout the day will be recorded. Aggressive behaviors such as biting and fighting will be noted and then compared to other behaviors that were exhibited, along with the amount of time each behavior was exhibited. This data will be used to determine if the enrichment objects and rewards had an effect on aggressive behavior exhibited by the swine.

## POSTER RESEARCH PRESENTATION

# BIO 306: Immunology

***Anti-NMDAR Encephalitis***
***Immune Response to the Treatment of Hemophilia A***
***Treatment of Systemic Lupus Erythematosus Using Allogeneic Mesenchymal Stem Cells***
***The Influence of HLA Compatibility on Graft Survival After Heart Transplantation***
***The Prevention and Treatment of Equine Herpesvirus Myeloencephalopathy (EHM)***

**Adviser**
M. Dana Harriger, Professor of Biology


Join the students enrolled in BIO 306: Immunology in an interactive forum and engage with them as you learn about various types of immunological disorders. Posters will reflect a comprehensive presentation of knowledge that the students gathered as they researched specific disorders. This student-centered, active learning experience incorporates the scientific poster presentation to foster the learning of immunology, as well as the communication of their chosen topic. Students successfully mined primary literature to collect information ranging from epidemiological data on incidence and population trends, any suspected correlations to genetics as well as inheritable factors to current and trending diagnostic and therapeutic approaches to the disorder. An overarching goal of the poster project was to substantially enhance the depth of understanding of the biology of immunology, as well as to provide a forum for an educational opportunity to convey facts and concepts about immunological disorders to the broader community.

## POSTER RESEARCH PRESENTATION

### BIO 207: Vertebrate Physiology

***The Physiological Effects of Captivity on Animals***
***Effects of Exercise and Equipment on the Respiratory Health of Performance Equines***
***Sound Source Localization in Barn Owls (Tyto alba)***
***The Evolution of the Yakutian Horse, Equus ferus caballus, and its Physiological Adaptations to Extreme Cold***
***Sonar and Echolocation in Wild Bottlenose Dolphins (Tursiops truncatus)***
***Physiological Effects, Clinical Signs and Treatment of Stonefish (Synanceia) Envenomation***
***Evaluating the Effects of Physical Activity on the Muscular System***
***The Physiological Effects of Chemotherapy***

**Adviser**
Brad Engle, Associate Professor of Biology

Join the students enrolled in BIO 207: Vertebrate Physiology for an interactive forum and engage with them as you learn about various physiological parameters, responses and adaptations in animals and humans. Posters will reflect a comprehensive presentation of knowledge that the students gathered as they researched specific physiological mechanisms of the vertebrate organism under varied conditions. This student-centered, active learning experience incorporates the scientific poster presentation to develop a better understanding of physiological principles and facilitate

communication about their chosen topic. Students successfully reviewed the primary literature to collect information about physiological effects, as well as underlying physiological mechanisms and responses to changing environmental conditions, both short and long-term. An overarching goal of the poster project was to substantially enhance the depth of understanding of physiology, as well as provide a forum for an educational opportunity to convey facts and concepts about physiological mechanisms to the broader community.

## POSTER RESEARCH PRESENTATION

### NUR 414:

***Optimizing Fluid Resuscitation in Septic Patients***
***Family Benefits of Witnessing Cardiopulmonary Resuscitation***
***Decreasing the Occurrence of Catheter Acquired Urinary Tract Infections***
***Compassion Fatigue and Burnout: Prevention Strategies for the Novice Nurse Population***
***Aromatherapy: A New Approach to Manage Pain and Anxiety in Hospital Patients***
***Preventing Falls in Hospitals***
***Understanding Congestive Heart Failure: A Nursing Perspective***
***How Music Medicine Helps Cancer Patients***
***Complementary and Alternative Medicine (CAM) Therapies Compared to Pharmacological use in ADHD Children***

**Adviser**
Alaina Smelko, Nursing Instructor

The students of NUR 414, Nursing Leadership, will present posters related to best practices and performance improvement at the bedside. Topics chosen by each pair of students focus on areas that they had particular interest. Posters reflect knowledge gained in clinical experiences, simulation, classroom discussions, and a literature review. Through a literature review, students have identified ways to improve practices. The overlying goal of the poster projects was to empower students to act as champions for change at the bedside and within the community.

## POSTER RESEARCH PRESENTATION

Aaron Hoke '19

### *Gender Blender: How World Wrestling Entertainment Portrays Gender Norms and Stereotypes in Its Weekly Television Programming*

World Wrestling Entertainment (WWE) is a global provider of weekly professional men's and women's wrestling television programs. Characters and story lines created for these programs are fundamentally how WWE represents gender to its worldwide audiences. My research explores the gender norms and stereotypes inherent in particular character portrayals and story lines in WWE programming, and considers the social implications of professional wrestling on society.

POSTER RESEARCH PRESENTATION

Laura Wilson '19

## *Lesbians in your Living Room: The Liberatory Function of* The L Word

Showtime's early 2000s lesbian drama, *The L Word*, provides a previously inaccessible view into queer life for the straight, closeted or ill-informed viewer, leading to a greater understanding of the ins and outs of queer life. My research suggests that, despite being an overall unrealistic and male gaze-centered example of lesbian life in America, *The L Word* uses its sex appeal to turn heads and change minds by providing a previously underrepresented example of successful, active, queer members of U.S. society, as opposed to the stereotypical dyke character we had been used to seeing.

POSTER RESEARCH PRESENTATION

## Classics 128: Introduction to Archaeology
## *The Wilson College Fulling Mill Project: An Update*

Ethan Kron ’20, Bryony Tilzey ’22, Anna Bavaro ’21, Adrianne Markle ’21

**Adviser**
Bonnie Rock-McCutcheon, Lecturer of Classics

The Wilson College Fulling Mill Project, a project to study the remains of the fulling mill on the property of the Fulton Farm, was started by the CLS 128: *Introduction to Archaeology* class of spring 2018. The fall 2018 class continued working on this project, expanding upon the work already completed by previous students. One of the goals of the fall 2018 class was to share the information about the fulling mill with the campus community and beyond. As part of that effort, a small group of students produced this poster for Student Research Day 2019.

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We would like to thank the members of the Student Research Day Committee. Without you, this wonderful day showcasing our students and their research would not be possible.

Thank you for all your hard work.

**Nicolaos Catsis**
*Assistant Professor of Global Studies*
*Chair, Student Research Day Committee*

**Megan Mizanty**
*Assistant Professor of Dance*

**Jennifer Buffenbarger**
*Assistant Professor of Nursing*

**Ronda Ranalli**
*Administrative Assistant to the Vice President for Academic Affairs*

**Ellen Ott**
*Administrative Coordinator, Academic Affairs*

**Margaret Light**
*Director of Corporate and Foundation Relations*

**Courtney Wolfe**
*Associate Director of Marketing and Communications*

**Robin Herring**
*Administrative Manager*

Wilson College Student Research Day highlights the research, scholarship, creative activities and achievements of students and their faculty mentors.


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