

Duquesne University

Duquesne Scholarship Collection

Undergraduate Research and Scholarship Symposium

2022-04-20

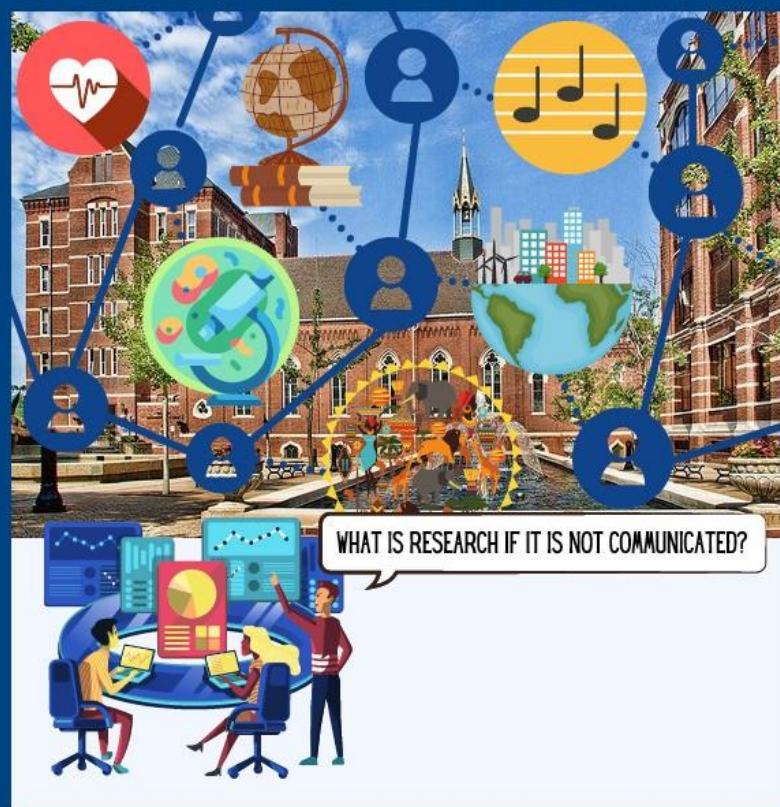
URSS 2022 Program Booklet

Mary McConnell
Duquesne University

Follow this and additional works at: <https://dsc.duq.edu/urss>

URSS 2022 Program Booklet. (2022). Retrieved from <https://dsc.duq.edu/urss/2022/proceedings/2>

This Paper is brought to you for free and open access by Duquesne Scholarship Collection. It has been accepted for inclusion in Undergraduate Research and Scholarship Symposium by an authorized administrator of Duquesne Scholarship Collection.



14TH ANNUAL

Undergraduate Research & Scholarship Symposium

Hybrid Event

In-Person: Wednesday, April 20, 2022: 8:30 am to 3:00 pm
Featuring Posters & Podium Presentations

Online: Monday, April 18 - Friday, April 22
Virtual Posters & Videos via [Symposium](#) by Forager One

Sponsored by Office of
Research & Innovation

TABLE OF CONTENTS



<u>ACKNOWLEDGMENTS</u>	3
<u>SCHEDULE</u>	4
<u>ORAL PRESENTATIONS</u>	6
<u>CREATIVE VIDEO COMPETITION</u>	8
<u>AWARDS</u>	12
<u>ABSTRACTS</u>	16
<u>PARTICIPANTS LIST BY SCHOOL</u>	91

ACKNOWLEDGEMENTS

The organizers would like to **thank** all of the *faculty mentors*

for their service and support of our undergraduate scholars.

Thank You!

We would like to thank the following organizations and individuals for their generous time and support of this event:

- ❖ Bayer School of Natural & Environmental Sciences
- ❖ Biomedical Engineering
- ❖ Center for African Studies
- ❖ Center for the Catholic Faith & Culture
- ❖ Center for Community-Engaged Teaching & Research
- ❖ Center for Excellence in Diversity & Inclusion
- ❖ Center for Global Health Ethics
- ❖ Center for Migration, Displacement & Community Studies
- ❖ Center for Teaching Excellence
- ❖ Center for Women's & Gender Studies
- ❖ Department of Counselor Education
- ❖ Department of History
- ❖ Department of Peace, Justice, and Conflict Resolution
- ❖ Department of Physician Assistant Studies
- ❖ Gumberg Library
- ❖ Enrollment Management Group
- ❖ Honors College
- ❖ Institute for Ethics & Integrity in Journalism
- ❖ Mary Pappert School of Music
- ❖ McNulty College and Graduate School of Liberal Arts
- ❖ School of Nursing
- ❖ School of Pharmacy
- ❖ Office of Disability Services
- ❖ Office of the Provost
- ❖ Office of Research, Christine Pollock & Mary McConnell
- ❖ Rangos School of Health Sciences
- ❖ University Academic Sustainability Committee



14TH ANNUAL

Undergraduate Research & Scholarship Symposium

Monday, April 18

All Day	Welcome – Virtual Symposium Site Launch! Browse through virtual posters and accompanying videos all week long! Comment and ask questions.
---------	---

Tuesday, April 19

9:30 am to 2:30 pm	In-Person Set-Up for Student Participants (Closed to Public) URSS Participants are required to stop by the Power Center to set up their poster.
--------------------	---

Wednesday, April 20

8:30 am to 3:00 pm	URSS In-Person Event – Location: Charles Dougherty Ballroom, Power Center Poster Sessions and Oral Podium Presentations *Detailed schedule on the next page – Open to the Public*
--------------------	--

Thursday, April 21

10:00 am to 11:00 am	"Everyday Mindfulness" Meditation Workshop (Virtual) Amber Lasure - Assistant Director, Wellness & Fitness, Duquesne University
----------------------	--

View Anytime	"All of Us" Pennsylvania Research Program - RECORDING Precision medicine, genetics, and evidence based engagement as a research framework for improvements in health care Mylynda Massart , MD, PhD., Co-Investigator All of US Pennsylvania and Lori Vish Stearns, M.Ed., M.S., Director, Engagement <i>All of Us</i> Pennsylvania Research Program
--------------	---

Friday, April 22

10:00 am to 10:45 am	"Writing an Effective Resume and Interview Techniques" – (Virtual) Debra L. Saffer, M.Ed, NCC, LPC - Asst. Director/ Career Consultant for Science, Engineering, and Health Care, Center for Career Development
----------------------	---

11:00 am to 12:00 pm	"Writing the Graduate School Personal Statement" (Virtual) Jim Purdy, Associate Professor of English/Writing Studies University Writing Center Director
----------------------	--

1:00 pm to 2:00 pm	"Fulbright Fellowship Opportunity" (Virtual) Christine Pollock, Senior Director of Sponsored Programs Office of Research and Innovation
--------------------	--

SCHEDULE FOR IN-PERSON EVENT

Wednesday, April 20, 2022 | Power Center @ Duquesne University

8:00 a.m. – 8:30 a.m.	Student Participant Check In Continental Breakfast provided for participants.
8:30 a.m. - 9:00 a.m.	OPEN POSTER SESSION Guests are invited to walk around, peruse student projects, and engage with students.
9:00 a.m. - 10:00 a.m.	ORAL PRESENTATION SESSION 1 Students participating in the poster sessions should attend the formal presentations. Poster Session is closed at this time. Please respect the formal presenters.
10:00 a.m. - 11:00 a.m.	OPEN POSTER SESSION Guests are invited to walk around, peruse student projects, and engage with students.
11:00 a.m. - 12:00 p.m.	ORAL PRESENTATION SESSION 2 Students participating in the poster sessions should attend the formal presentations. Poster Session is closed at this time. Please respect the formal presenters.
12:00 p.m. - 1:00 p.m.	OPEN POSTER SESSION Boxed lunches provided for participants and judges. We encourage you to eat your lunches while viewing posters.
1:00 p.m. - 2:00 p.m.	ORAL PRESENTATION SESSION 3 Students participating in the poster sessions should attend the formal presentations. Poster Session is closed at this time. Please respect the formal presenters.
2:00 p.m. to 3:00 p.m.	OPEN POSTER SESSION Guests are invited to walk around, peruse student projects, and engage with students.
ALL AWARD WINNERS WILL BE ANNOUNCED THE WEEK FOLLOWING THE EVENT VIA EMAIL & ON OUR WEBSITE!	

Oral Presentations – Detailed Schedule	
SESSION 1	
Section A – Charles Dougherty Ballroom	
Moderator: Kandarp Dave	
9:00 am – 9:15 am	<p>Rebekah Meyers Pharmacy School of Pharmacy Faculty Advisor: Autumn Stewart-Lynch, PharmD, BCACP Abstract: 84 <i>Quantifying the Presence of Insulin Overbasalization in a Family Medicine Practice</i></p>
9:15 am – 9:30 am	<p>Marie Sullivan Environmental Science Bayer School of Natural and Environmental Sciences Faculty Advisor: David Kahler, Ph.D. Abstract: 29 <i>Comparison of the Accuracy of Satellite Precipitation Measurements to Ground Precipitation Gages in South Africa</i></p>
9:30 am – 9:45 am	<p>Jessica Towns and Kiearra Saldi Biomedical Engineering Biomedical Engineering Faculty Advisor: Bin Yang, Ph.D. and Kimberly Williams, Ph.D. Abstract: 20 <i>Bioprinting Molds for Tissue Engineering Scaffolds Applications</i></p>
9:45 am to 10:00 am	<p>Meredith Hill Nursing School of Nursing Faculty Advisor: ERGIE INOCIAN, EdD Abstract: 40 <i>Enhancing caring behaviors among undergraduate nursing students in the clinical learning environment: An integrative review</i></p>

Oral Presentations – Detailed Schedule	
SESSION 2	
Section A – Charles Dougherty Ballroom	
Moderator: Anna Vietmeier	
11:00 am – 11:15 am	<p>Lindsay Seidel and Erica Glaneman Occupational Therapy Rangos School of Health Sciences Faculty Advisor: Meghan Blaskowitz, DrPH, MOTR/L Abstract: 17 <i>Building Self-Determination: Supporting Students with Intellectual Disability in Higher Education and Beyond</i></p>
11:15 am – 11:30 am	<p>Mackenzie Farbo, Seth Stoll Psychology McAnulty College and Graduate School of Liberal Arts Faculty Advisor: Alexander Kranjec, Ph.D.</p>

	Abstract: 91 <i>Social Conformity in Virtual Meetings</i>
11:30 am – 11:45 am	Mary Marlett and Cassidy Scassa Nursing School of Nursing Faculty Advisor: Rebecca Kronk, Ph.D. Abstract: 13 <i>Are Informed Consents Really Informed in the Era of Precision Health? Impact Reading Level has on Consumers</i>
11:45 am to 12:00 am	Jason Minicozzi Political Science, Sociology, Philosophy McAnulty College and Graduate School of Liberal Arts Faculty Advisor: Kathleen Roberts, Ph.D. Abstract: 11 <i>No Human is Illegal: The study of Anti-Homeless and Hostile Architecture</i>

Oral Presentations – Detailed Schedule

SESSION 3

Section A – Charles Dougherty Ballroom

Moderator: Adam Rish

1:00 pm – 1:15 pm	Raegen Esenwein Biology Bayer School of Natural and Environmental Sciences Faculty Advisor: Jill Dembowski, Ph.D. Abstract: 89 <i>Role of DNA Topoisomerase 1 in Herpes Simplex Virus Type-1 Infection</i>
1:15 pm – 1:30 pm	Haley Oroho History/Political Science McAnulty College and Graduate School of Liberal Arts Faculty Advisor: Andrew Simpson, Ph.D. Abstract: 111 <i>The Misrepresentation of Native Americans in Textbooks in the United States</i>
1:30 pm – 1:45 pm	Alexis Throop and Nicole Bohatch Biomedical Engineering Biomedical Engineering Faculty Advisor: Rana Zakerzadeh, Ph.D. Abstract: 62 <i>Intraluminal thrombus and risk of rupture in patient specific abdominal aortic aneurysm</i>
1:45 pm to 2:00 pm	Selvin Hernandez, William Miller, Nicholas Shaffer, Jonathan Wehner, and Ian Ferris Biomedical Engineering and Nursing Rangos School of Health Sciences/School of Nursing Faculty Advisor: Leda Kloudas, Ph.D.

	Abstract: 134 <i>Valve Replacement Combined Surgical Device</i>
--	--

CREATIVE VIDEO COMPETITION

Creative videos will be featured during the poster session and played on a loop in no particular order during the poster sessions on April 20. Videos are also available on our [Symposium site](#). While every poster session participant was required to submit a video explanation or voiceover of their poster, the Video Competition aims to allow flexibility, various locations, creativity, and thinking “outside the box”.

147 Duquesne Occupational Therapy Students at Vincentian Home

Kaitlyn Joyce, Sara Braim, Micaela Crawford, Rachel DeStefano, Morgan Hansen
 Occupational Therapy | Rangos School of Health Sciences
 Faculty Advisor: Ann Stuart, OTR/L

ABSTRACT: This video defines and emphasizes the role of Occupational Therapy (OT) practitioners within the geriatric population residing in skilled nursing facilities (SNF) during the COVID-19 pandemic. The COVID-19 pandemic has had a drastic effect on the residents of SNF’s, isolating them from fellow residents, their families, and friends as part of the intense, precautionary measures the pandemic has brought about. Unfortunately this has inordinately created a lasting effect on residents’ mental health status, thus decreasing their overall quality of life. As OT students we have been working firsthand with the residents at Vincentian Home in the North Hills area, to create and implement purposeful activities that coincide with OT skilled services. Each of our meaningful activities works to target an increase in social participation and engagement, solely by the resident’s attendance, but is built upon using our unique OT knowledge. As a result, our interventions have enhanced the resident’s involvement in leisure activities and created a more positive social environment between staff, residents, and families.

148 Occupational Therapy at Community Living and Support Services (CLASS)

Claire Falasco, Rachel Dowell, Tesla Knight, Mariana Pacheco
 Occupational Therapy | Rangos School of Health Sciences
 Faculty Advisor: Ann Stuart, OTD, OTR/L

ABSTRACT: As part of the occupational therapy (OT) curriculum at Duquesne, OT students attend community sites in the Pittsburgh area and facilitate client-centered interventions based on the needs of the site. Specifically, we attend Community Living and Support Services (CLASS) on Tuesday’s for art class and Thursday’s for computer class. There are individuals with a wide variety of physical and cognitive abilities within CLASS’ adult day program, including Cerebral Palsy, Down Syndrome, low vision or blindness, and types of intellectual and developmental disabilities (IDD). At CLASS, OT lends distinct value through the creation of active engagement and social participation opportunities in order to

increase participants' self-efficacy. The OT students work to adapt activities, create compensatory techniques, and grade levels of assistance to allow for all members to equitably participate in the class activities. In this video presentation, you will see how occupational therapy is used in the computer and art classes to increase client confidence in their skills and abilities.

[149 Occupational Therapy's Role in Emerging Community-Based Sites: The Jasmine Nyree Campus](#)

Erica Glaneman, Kathleen Shepherd, Jordyn Caputo
Occupational Therapy | Rangos School of Health Sciences
Faculty Advisor: Ann Stuart, OTD, OTR/L

ABSTRACT: Occupational Therapy (OT) students from Duquesne University have collaborated with Jasmine Nyree Staff at their new campus in the Sheraden neighborhood to create and implement "Calling All Girls!" a new community-based social empowerment program for girls aged 12-15. The Jasmine Nyree vision is to provide this under-served area with reliable and progressive resources across all ages and abilities. The unique perspective of OT plays a key role in assisting staff to increase community engagement, self confidence, social skills, and healthy coping mechanisms to promote success in the girls' environments. In addition, Duquesne's mission of service to "walk with those on the margins" guides group interventions to provide resources and programming opportunities. Evaluation methods such as the Kawa model present a culturally receptive, non-standardized approach to assess perceived barriers, environmental resources, and personal attributes that directly affect the "life flow" of participants. This evaluation method uses creative expression to demonstrate how the participants of "Calling All Girls!" view themselves and their environments as supporting or hindering their participation in desired occupations. OT students use these assessments along with pre-program surveys to appropriately plan weekly intervention sessions that are effective, engaging, and client-centered. Some examples of intervention sessions include implementing mindfulness activities to teach stress management skills, role playing interpersonal conflicts to increase positive communication skills, and open discussions about impacts of social media and self-esteem journaling to increase confidence. This newly established program is planned to continue through Jasmine Nyree with the OT lens to further implement holistic and empowering interventions for girls in the community.

[150 JFCS](#)

Julie Downs
Occupational Therapy | Rangos School of Health Sciences
Faculty Advisor: Ann Stuart, OTD

ABSTRACT: Refugee youth experience difficulty in acclimating to life in a new country both due to language barriers, past trauma and the stress of culture shock. Occupational Therapy can play a key role in helping refugee youth to acclimate to their new living contexts. Jewish Family and Community Services (JFCS) is a nonprofit organization that supports refugees by helping them find homes, jobs, and practice language skills. One component of JFCS is the Bridge Builder's Crew, which is a virtual after-school program that focuses on improving literacy skills, social participation, and mental health in refugee children in grades 2-5. Occupational therapy has helped create client-centered interventions to

further the social participation, health and wellbeing, and psychosocial functioning of the refugee youth. Specifically, we have utilized the KAWA model, Trauma-Informed Care, and psychosocial interventions to enhance the experiences of the refugee youths in the Bridge Builder's Crew. Learn more about the positive role that occupational therapy has on refugee children in our video!

[151 Community Engaged Learning at Family Links: DOCS](#)

Elena Martino, Mikayla Van Aken
Occupational Therapy | Rangos School of Health Sciences
Faculty Advisor: Ann Stuart, OTD, OTR/L

ABSTRACT: This video highlights the unique role of occupational therapy (OT) in working with young adults (ages 18-24) experiencing homelessness in Allegheny County. Three occupational therapy students have been going to the Downtown Outreach Center and Shelter (DOCS) in Uptown, Pittsburgh for 6 months, 2 hour sessions each week, implementing interventions revolving around increasing self esteem and mental wellness. By increasing self esteem and mental wellness through meaningful activities, the OT students aim to empower the residents of DOCS to find secure housing, employment, and supportive relationships in the future. The sessions are client-centered, tailored to the residents' individualized goals and needs. The video will break down the process behind the development of a session promoting household and money management skills through a cooking activity. In addition, this will emphasize the value of OT in community based settings like DOCS.

[152 The impact of occupational therapy within the the St. Anthony's program](#)

Alivia Cartwright, Karlie Musich, Melissa Nafziger, Rachel Shirmer
Occupational Therapy | Rangos School of Health Sciences
Faculty Advisor: Ann Stuart, OTD, OTR/L

ABSTRACT: This video will elaborate on the role of occupational therapy (OT) with adolescents with intellectual and developmental disabilities (IDD) of varying ability level to optimize their occupational performance as they transition into adulthood. The St. Anthony's school program is a post-secondary educational program hosted at Duquesne University for individuals aged 18-21 with IDD. The program transports students to an off-campus apartment located in Squirrel Hill for real practice in life skills. Individuals with IDD often face difficulties in developing independence in daily life tasks, creating and maintaining meaningful social interactions, as well as finding and maintaining employment. As occupational therapy students, our involvement with the students at St. Anthony's revolves around improving performance of life skills, such as household management, budgeting, cooking, and grocery shopping. We also assist students in advancing cognitive skills and search skills involved in vocational opportunities for students to pursue post-graduation from the program. This year, OT students were able to attend sessions in-person, allowing us to develop greater rapport with the students and increase the level of assistance we are able to give them.

[153 Occupational Therapy at Goodwill Aspire](#)

Mina Stollberg, Lindsay Seidel, Sarah Refosco, Carissa Pegg
Occupational Therapy | Rangos School of Health Sciences

Faculty Advisor: Ann Stuart, OTD

ABSTRACT: Goodwill Aspire is an adult training facility located at the Goodwill complex in Lawrenceville for individuals ages 18-59 with Developmental Disabilities (DD). Aspire, which is Pennsylvania licensed and accredited by the Commission on Accreditation of Rehabilitation Facilities (CARF), is focused on promoting job readiness skills, activities of daily living, self-care, and independent living skills for its members. Aspire's mission statement focuses on integrating individuals into the community in order to provide a meaningful, everyday life for those members. There are about 20 clients on average that attend Goodwill Aspire each day and receive services. Two occupational therapy (OT) students, Sarah and Carissa, work with a certain group of individuals every Tuesday morning to help promote member's role competence, social participation, and communication skills to be more independent in their community. Two other OT students Lindsay and Mina, assist Aspire members on Thursday mornings, working on volunteer exploration and participation with another group of clients. Our goal at Aspire is to make the program more engaging and tailored toward each clients' needs based on their diagnosis and cognitive functioning level. With collaboration, we strive to create more meaningful lessons that will encourage occupational engagement of clients, while generating a program that facilitates growth in understanding member's personal interests and goals in occupations which they find important to them.

[154 The Role of Occupational Therapy at Shepherd's Heart House for Hope](#)

Amanda Dean, Emily Hall, Caitlin Ulrich
Occupational Therapy | Rangos School of Health Sciences
Faculty Advisor: Ann Stuart, OTD, OTR/L

ABSTRACT: Shepherd's Heart House of Hope provides transitional housing to veterans experiencing homelessness in the Pittsburgh area. This video will explain the role occupational therapy within Shepherd's Heart and how OT services support independent living skills and residents' valuable interests. The primary goal of occupational therapy is supporting individuals in engaging in what they want to do, need to do, and are expected to do. As students at Shepherd's Heart, it was critical to create equitable opportunities for engagement in meaningful activities including community engagement, independent living skills, and stress management..

[155 Engineering Extracellular Vesicles With an Enriched Mitochondrial Load](#)

Duncan Dobbins
Pharmacy | School of Pharmacy
Faculty Advisor: Devika Manickam, Ph.D

ABSTRACT: Stroke is a leading cause of death and long-term disability globally and current therapies like tPA are minimally effective. Stroke damages the mitochondria of brain endothelial cells(BECs) that line the blood-brain-barrier(BBB). The damaged mitochondria produces toxic reactive oxygen species that cause the BECs to lose their tight junction and strict regulation. The damaged vasculature of the BBB now becomes leaky and precedes damage to the neurons. Our lab believes that protecting the BBB will be a vital therapy for improving stroke outcomes.

Extracellular vesicles (EVs) are vital for cell communication and are promising carriers for the delivery of biotherapeutic cargo such as RNA and proteins. My research has taken a deeper dive into mitochondria, as it is an innate component of medium-to-large (m/IEVs). Our past studies have demonstrated their ability to deliver and transfer polarized mitochondria to recipient BECs and neurons in mouse brain slices. After proving that m/IEVs colocalize in recipient BECs mitochondrial network and improved their ATP levels in models of stroke we wanted to take the next step to explore their potential.

Here, we sought to determine if the innate EV mitochondrial load can be further increased via increasing mitochondrial biogenesis in the donor cells. Peroxisome proliferator-activated receptor-gamma coactivator-1 α (PGC1 α) is a central mediator of mitochondrial biogenesis and to activate this we treated our donor cells with Resveratrol to compare the resveratrol-treated "mito-EVs" to naïve- EVs

[156 “Madam” Elizabeth: Elizabeth Hobbs Keckley’s Sisyphean Attempt to Join the “Cult of True Womanhood”](#)

Bella Biancone

History and Political Science | McAnulty College of Liberal Arts

Faculty Advisor: Jennifer Whitmer-Taylor, Ph.D

ABSTRACT: Nineteenth century notions of femininity and etiquette were governed by strict societal standards. “True Womanhood” was defined by four fundamental virtues— piety, purity, submissiveness, and domesticity. However, there was another pre-requisite for joining this revered cult: whiteness. No matter how pious or domestic a woman of color was, she could never hope to be considered a proper lady by Victorian standards. In discerning what it meant to be a member of that “cult of True Womanhood,” Black women were used to determine the boundaries of white womanhood; a “True Woman” was to be the antithesis of the stereotypical sexual and dominant Black woman. That understanding, however, would be challenged by modiste to the Washington elite and former enslaved woman, Elizabeth Hobbs Keckley. Keckley published her autobiography Behind the Scenes, or Thirty Years a Slave, and Four in the White House in 1868, detailing her emancipation and her time working for First Lady Mary Todd Lincoln. Its publication received widespread attention, leaving most appalled with her candor about the First Family. Keckley pierced the tranquil sphere of the domestic realm, bringing it into the public forum. With everything to lose as a Black woman in the postbellum period, one must ask the question: why would Keckley write the work in the first place? Though it may seem complicated at first glance, the answer is rather simple: respectability. Although Black women were often used to define “True Womanhood” for white women, Elizabeth Keckley’s prose uses a white woman, Mary Todd Lincoln, to show how a Black woman like herself much better represents “True Womanhood.”

[157 Teddy Roosevelt, William Howard Taft, Presidential Power, and the Article III Courts: A Struggle Between Progressivism and the Constitution](#)

Simon Jaronski

Political Science/History | McAnulty College of Liberal Arts

Faculty Advisor: Kristen Coopie, Ph.D

ABSTRACT: Contemporary debates over the wielding of executive power in pursuit of political objectives find their historical analog in early 20th century Progressive Era America, when the political-constitutional struggle between Theodore Roosevelt and William Howard Taft laid the groundwork for the modern presidency. Their competing visions of executive leadership - one unrestrained by the Constitution, the other normatively compelled by it, respectively - are fundamentally at variance ontologically. Additionally, the relationship between the two men, and any historical or legal analysis of their executive and political actions, is complicated even further by the degradation of their once amicable - even inimitable - personal relationship, as well as their puzzlingly reconcilable political aims for amelioration of America's ills at a time when radically unjust material conditions prevailed. Via a comparative analysis of the two men's differing comportments to the Article III courts and their unique precedential prerogatives (exemplified by so-called reactionary *Lochnerism* and the Income Tax debates), their respective approaches to anti-trust and corporatocracy, and federal regulation of the environment (specifically through the lens of legislative-executive interplay in the emergence of incipient bureaucratic structures like the USFS), I aim to show that Teddy Roosevelt's vision of executive power prevails today, while Taft's vision, far from lurking in the background as a reactionary undercurrent (as some historiography might suggest), is a proceduralist-based alternative to TR's unaccountable stewardship theory. In addition, Taft's philosophy retains the liberal-conservative approach that is all but a vestige in modern political discourse and life.

AWARDS

[Bayer School of Natural and Environmental Sciences](#)

2 for Excellence in Research in the Basic Sciences

4 Honorable Mentions

Students participating in the Undergraduate Research & Scholarship Symposium whose project fall within the realm of the basic sciences will be considered for this award.

[Biomedical Engineering](#)

Duquesne Award for Excellence in Biomedical Engineering

[Center for the Catholic Faith and Culture](#)

Common Good Research Award

This year, the Center will recognize and reward research from any discipline that aligns with Duquesne's Catholic, Spiritan mission, particularly our commitments to:

- the dignity and equality of all persons
- working with vulnerable populations for systemic change
- preserving justice, peace, and integrity of creation

[Center for African Studies](#)

Award for Undergraduate Research in African Studies

The award is intended to encourage and reward undergraduate research in African Studies and related areas that engage Duquesne's ongoing commitment to Africa.

Award for Undergraduate Research in Global Health

The award is intended to encourage and reward undergraduate research in Global Studies

[Center for Community-Engaged Teaching and Research](#)

CETR Award for Undergraduate Research

[The Center for Excellence in Diversity and Student Inclusion](#)

Undergraduate Research Award

The Center for Excellence in Diversity and Student Inclusion is pleased to sponsor an award for outstanding, undergraduate research. The aim of this award is to recognize and celebrate research that contributes to creating, and maintaining an inclusive campus community here at Duquesne University.

[Center for Migration, Displacement and Community Studies](#)

Outstanding Research Award

This award aims to support original research related to migration, displacement and community through original research. Eligible projects focus on creating awareness about these issues in our communities from any disciplinary perspective.

Criteria: Judges will assess the following elements of the research: 1) Connection to themes of migration, displacement and community studies; 2) Scholarly merit including: originality of research and contribution to the field; clear articulation of the research question, existing literature, methods, and contributions to the field.

[Center for Teaching Excellence](#)

Award for Undergraduate Research

Eligible projects focus on the study of human learning in any of its many contexts, including but not limited to K-12 education, college, community, and clinical settings. Projects will explore topics such as how and where learning happens or what empowers or hinders people in their learning.

[Center for Global Health Ethics](#)

Award for Undergraduate Research in Ethics

This award aims to promote the interest of students for issues in healthcare ethics within contemporary society and culture. It also intends to encourage undergraduate research in the area of healthcare ethics. The HCE prize is for the presentation that best highlights ethical issues in healthcare and ethical dimensions of developments in science and technology for human health and wellbeing.

[Center for Women's and Gender Studies](#)

Award for Undergraduate Research.

[Counselor Education Program](#)

2 Awards for Undergraduate Research

[Department of Physician Assistant Studies](#)

Award for initiative and potential for future research as a physician assistant

[Gumberg Library](#)

Gumberg Library Award for Undergraduate Research Honorable Mention

The Gumberg Library Award judges posters based on their intellectual merits and demonstration that the research presented meets the standard of its field.

[History Department](#)

Clio Award for Undergraduate Research

Named for the muse of History, the Clio Award for Undergraduate Research includes first, second, and third place categories, and is given to History and/or Art History majors who participate in the Annual Undergraduate Research and Scholarship Symposium (URSS). A panel of judges comprised of the Department Chairperson and the Director of Graduate Research selects the winners.

[Honors College](#)

Outstanding Poster and Outstanding Video

Symposia posters are at their best when they optimally combine intellectual sophistication with legibility to the non-specialist. Therefore, criteria for this award include: scholarly rigor; visual appeal; organization; professional polish.

[Institute for Ethics and Integrity in Journalism](#)

Top Undergraduate Research Paper

The DU Institute for Ethics and Integrity in Journalism will be presenting its inaugural award to the top undergraduate research symposium paper that tackles a current issue in local or national journalism ethics. The winning entry will not only identify and elaborate on an ethical issue in journalism today but create an avenue for discourse about journalism ethics and offer possible solutions.

[Mary Pappert School of Music](#)

Mary Pappert School of Music Undergraduate Award

The Mary Pappert School of Music Undergraduate Award is open to all music students who participate in the URSS.

[McAnulty College and Graduate School of Liberal Arts](#)

Outstanding Research Merit

The McAnulty College and Graduate School of Liberal Arts Outstanding Merit Award is open to undergraduate participants in the liberal arts. A committee of Liberal Arts faculty and administrators will evaluate the posters' intellectual merits and demonstration that the research presented meets the standard of its field.

[School of Pharmacy](#)

Award for Undergraduate Research

The School of Pharmacy Award for Undergraduate Research serves to recognize projects in the field of pharmacy which demonstrate a high level of scholarly merit.

[Office of the Provost](#)

Provost Award for Outstanding Research

Office of Research Award for Outstanding Research

Provost Award for Best Presentation

This award serves to recognize outstanding scholarship within the university across all of the fields of study. The awards will be given to a student demonstrating exceptional scholarship through either poster or oral presentation.

[Office of Disability Services](#)

Outstanding Undergraduate Research, 2 Awards

The Office of Disability Services is pleased to sponsor an award for outstanding undergraduate research. The aim of this award is to recognize and celebrate research that contributes to the field disability research through direct services, policy development, community service, research, or organizational leadership.

Peace Justice and Conflict Resolution

The Peace, Justice and Conflict Resolution (PJCR) Minor Program Award

The Peace, Justice and Conflict Resolution (PJCR) Minor Program offers an undergraduate research/scholarship award for research related to peace or conflict studies. The reward hopes to stimulate undergraduate awareness of factors for a sustainable social and political stability, the obstacles to peace, and the building blocks of a just global society.

Rangos School of Health Sciences

Rangos School of Health Sciences Award for Undergraduate Research: 2 award

Students of the Health Sciences who are participating in the URSS will be eligible for these awards.

School of Nursing

School of Nursing Undergraduate Research Award

The School of Nursing Undergraduate Award is available to students participating in the URSS whose research is applicable to the healthcare and/or nursing field. Projects will be evaluated based upon the the use of existing research for support, understanding and application of principles of research, effective communication, etc.

University Academic Sustainability Committee

Excellence in Sustainability & the Environment

3 Honorable Mentions

Office of Research and Innovation

Video Competition Award

The URSS Video Competition allows DU undergraduates a creative opportunity to convey their research or scholarship via a video platform. Students must create a video under 3 minutes, which will be viewed by a panel of judges, and featured during the annual Undergraduate Research and Scholarship Symposium. The top two videos will win cash awards.

ABSTRACTS

Note: The number in front of each title corresponds with the physical place the student's poster will be located at the in-person event on April 20.

*Indicates live in-person oral presentation on April 20.

1: "One Small Step"

Samiya Henry

Physics | Bayer School of Natural and Environmental Sciences | Freshman

Faculty Advisor: Theodore Corcovilos, Ph.D.

ABSTRACT: As of right now, NASA and other space programs are estimating that by 2026, there will be people living in Space. Whether it be the Moon or Mars, one cannot have a functional society without a proper source of laws, especially since no one country has ownership over space. "One Small Step" will produce this source of laws, called the "Space Bill of Rights," that will outline important matters like the trade of resources, medical care, government officials, and will ensure the preservation of our physical and figurative footsteps in space. This Space Bill of Rights is made up of two main sections: federal laws and laws pertaining to medical ethics. This poster will show the significance behind having set laws in place in order to form a new society while still protecting and preserving human health, human rights, and peace among the several countries who are still running in the modern-day Space Race. The research used responses from international surveys, which has led to a revision of the Bill.

2: "Parent Needs and Concerns of CAS through Social Media: A Community-Based Research Project"

Claire Primm

Speech-Language Pathology | Rangos School of Health Sciences | Sophomore

Faculty Advisor: Megan Overby, Ph.D.

ABSTRACT: Apraxia Kids (AK) is a national non-profit organization devoted to research and dissemination of information about a motor-based speech disorder known as childhood apraxia of speech (CAS), where the brain struggles to develop plans for speech movement. Since little information is known about the needs and interests of parents of children with CAS, AK wanted to learn how those needs were expressed within certain themes and sub-themes in the AK organization's Facebook pages. The current qualitative study addressed the following questions: (1) For each of the key areas or themes what was the frequency of comments under the parent Facebook posts? (2) Were there differences in frequencies among parent postings at the National Facebook page, State (Pennsylvania) Facebook page, and Local (Pittsburgh and Hersey) Facebook pages? I collected posts for two weeks from the publicly available Facebook pages of the following organizations: 1) National Apraxia Kids, 2) Apraxia Kids Pennsylvania (PA), 3) Apraxia Kids Pittsburgh, and 4) Apraxia Kids Hershey. Results revealed that most (40.7%) posts on the National Facebook page were attributed to the theme of parents asking questions

or advice to other parents. This pattern continued for the Pennsylvania and local Facebook parent groups. The second most common (16.9%) theme in the National page was school-based issues and the second most common (14%) theme in the Pennsylvania group was augmentative and alternate communication. Because overall profiles of concern in the National and Pennsylvania levels were different, it suggests that parent interests and concerns about CAS may differ regionally.

3: 3-Dimensional Agent-based Model of Neural Activity in the Central Nucleus of the Amygdala During Pain

Carley Reith

Applied Math and Computer Science | McAnulty College and Graduate School of Liberal Arts | Junior Faculty Advisor: Rachael Neilan, Ph.D.

Benedict Kolber, Ph.D.

ABSTRACT: The central nucleus of the amygdala (CeA) is a region of the brain important in pain processing. Neurons within the CeA expressing protein kinase c-delta (PKC δ) or somatostatin (SOM) have opposing roles in pain modulation. We created a 3-dimensional agent-based model (ABM) of these neuron populations and their connectivity in the CeA to predict system-level measures of pain.

The model was programmed in NetLogo3D, specialized software for designing and visualizing 3-D ABMs and model parameters were estimated using laboratory data. During the model's initialization, a 3-D spatial domain representing the CeA and its sub-nuclei is created using data from the Blue Brain Cell Atlas. Within the spatial domain, agents representing individual neurons are created with cell-type specific properties and behaviors, and a network of directed links between the neurons is established. During each model time step, neurons accrue damage based on the intensity of an external stimulus, and the firing rates of all neurons are updated. Inhibitory signals are sent between neurons via the network. If a neuron's incoming signals exceed a threshold, the neuron is silenced. At the end of each model time step, a system-level measure of pain is calculated as the difference in the cumulative firing rates of PKC δ and SOM neurons.

Our results demonstrate that the model can produce realistic pain output for a variety of scenarios, including constant and non-constant stimuli. The model serves as a framework for testing hypotheses about pain-related neurons in the CeA without committing significant time and resources to laboratory experiments.

4: A Computational Study of the Behavior of a Model Squaramide Catalyst System

Serina Tressler

chemistry | Bayer School of Natural and Environmental Sciences | Junior

Faculty Advisor: Thomas Montgomery, Ph.D.

ABSTRACT: The need for environmentally friendly alternatives to metal catalysts continues to grow as their harmful impact on the environment and unsustainability become more apparent. One greener option is hydrogen bonding organocatalysts, which are typically inexpensive and made from renewable feedstocks. However, the way that dual hydrogen bond donor (DHBD) catalysts interact with aryl groups is not well understood, and this is a barrier to effective catalyst design. Common DHBD catalyst cores

such as squaramide and thiourea have recently been a focus of study, but the structure and non-covalent interactions (NCIs) of unsubstituted squaramide with common substrates has not been thoroughly explored. This study computationally examined the NCIs between squaramide and benzene as a model catalyst-aryl system. We used the Truhlar M06-2X functional and second-order Møller-Plesset perturbation theory (MP2) with Dunning's aug-cc-pV[D,T,Q]Z basis sets for geometry optimization and energy evaluation. Additionally, we employed the Boys and Bernardi counterpoise method to account for basis set superposition error (BSSE) for use in comparison to uncorrected values and natural bond orbital (NBO) analysis to evaluate charge transfer. Three apparent interactions were produced from these calculations, each featuring both hydrogen and π -type interactions. Based on these findings, squaramide likely participates in strong non-covalent interactions with aryl substrates. Our work brings valuable insight into how squaramide-based organocatalysts may interact with aryl-containing compounds and the potential effects of BSSE on calculations of those interactions.

5: A Review of Oral Immunotherapy for Food Allergies

Anna Baxter

Physician Assistant Studies | Rangos School of Health Sciences | Sophomore

Faculty Advisor: Bridget Calhoun, DrPH, PA-C

ABSTRACT: Food allergies affect approximately 10 percent of the global population, with increasing prevalence over the past two decades. Due to lack of practitioner and patient awareness and education, it is estimated that many cases go undiagnosed. While there is no cure for food allergies, recent research has been promising as far as showing signs of reduced risk of allergic reactions in some patients. Recently, oral immunotherapy has been researched and has implications of inducing sustained tolerance, which serves as a protective effect for those with a food allergy in the case of accidental ingestion. In some cases, study participants have built up enough tolerance to consume the allergen regularly, indicating that they are no longer affected by the allergen (as long as regular consumption continues). This review article details oral immunotherapy in those who suffer from food allergies.

6: Accuracy of DNA Phenotyping using MiSeq Next Generation Sequencing

Paige Aymar

Biochemistry/Forensic Science | Bayer School of Natural and Environmental Sciences | Senior

Faculty Advisor: Pamela Marshall, Ph.D.

ABSTRACT: DNA phenotyping is a new and upcoming technique in forensic science that will allow a facial image of a suspect to be created from DNA. This type of forensic evidence will allow investigators to obtain facial composites of the perpetrator by examining hair color, eye color, and skin color, but the question in play is just how accurate this technique is in predicting these characteristics. Verogen, a forensic science company, has created a next-generation sequencing instrument, MiSeqFGx, and lab kits, that will allow for hair color, eye color, and biogeographical ancestry (skin color) to be predicted. To obtain these phenotypic characteristics, three steps are included for the process: library preparation, cluster generation sequencing, and data analysis. A study will be conducted on 12 participants to examine the validity of this instrument, demonstrating how accurate and precise the MiSeqFGx is. The

findings will suggest how reliable this instrument is, as well as help in deciding if DNA phenotyping should be used in a forensic lab for criminal investigations.

Keywords: DNA Phenotyping, Next Generation Sequencing, Forensic Genetics

7: Analysis of follow-up times for families discharged from opioid addiction treatment facilities

Abigail Reith (Biomedical Engineering/Applied Mathematics, Carley Reith (Mathematics), Lindsay Moskal (Chemistry and Mathematics),
McAnulty College and Graduate School of Liberal Arts, Bayer School of Natural and Environmental Sciences, Biomedical Engineering | Junior
Faculty Advisor: Rachael Neilan, Ph.D.

ABSTRACT:

Caregivers who receive treatment for opioid addiction often face adverse post-discharge incidents involving Children, Youth, and Family (CYF) services. These incidents can be traumatic for the children involved, potentially leading to the removal of a child from his/her home. Nonprofit social service organizations like Auberle aim to minimize these adverse events by implementing frequent follow-ups with discharged caregivers and their families.

We collaborated with Auberle and the Allegheny County Department of Human Services (DHS) to evaluate the effectiveness of standard follow-up times (7-, 30-, and 90-days post-discharge) and to determine if implementing additional follow-ups result in fewer CYF cases. Using data provided by the DHS, we constructed a mathematical function defining the probability that a CYF case will occur within one week of a follow-up. We then developed a stochastic algorithm to determine the optimal timing and impact of additional follow-ups.

Our results show that during the 90-day period where standard follow-up times were implemented, there were 54.7% fewer CYF cases than the 90-day period with no follow-ups. We found that if one additional follow-up is implemented, it should occur 160 days post-discharge and can reduce the number of CYF cases by 9.3%. Alternatively, two additional follow-up times, occurring at 138 and 171 days post-discharge, would reduce the number of CYF cases by 19.5%.

These findings can be used by Auberle to determine when their staff should follow-up with families discharged from the Family Healing Center, a new opioid treatment facility in the Mt. Oliver neighborhood.

8: Analysis of Eight Lithuanian Temporal Bones with Anatomical Abnormalities and Skeletal Evidence of Inner Ear Infections

Abigail McNamee
Forensic Science and Law | Bayer School of Natural and Environmental Sciences | Senior
Faculty Advisor: Lisa Ludvico, Ph.D.

ABSTRACT: Recent research has suggested that the mastoid temporal bone is one of the best places to retrieve DNA in human remains. There is no universal technique for ancient DNA (aDNA) extraction due to difficulties with degradation, contamination, and environment. Eight Lithuanian temporal bones

(200-400 AD) with anatomical abnormalities were obtained to perform fragment analysis. The ancient bones were physically compared to modern temporal bones in order to compare the abnormal structure, which looked like a severe case of mastoiditis. By further examining the Lithuanian bones, it can be determined if the irregular structures were achieved genetically or environmentally. The aDNA was extracted using a procedure from the UNT Center for Human Identification, quantified with qPCR, amplified with PCR, and analyzed on the MiSeq FGx Sequencing System. Analysis supported that the bones with abnormalities show a degree of relatedness, which can further aid in understanding this population's lifestyle and environment.

9: Analysis of Marine Cyanobacteria with Sigma 2 Binding and TNBC Cytotoxicity

Katelyn Grenell

Pharmacy | School of Pharmacy | Senior

Faculty Advisor: Kevin Tidgewell, Ph.D

ABSTRACT: The role of natural products such as cyanobacteria in drug development is well established. In recent years, marine cyanobacteria have been regarded as a major source of biologically active metabolites with chemical and pharmacologic diversity. These cyanobacterial natural products serve as a promising source of drug leads for the discovery of therapeutic agents used in the treatment of many diseases of interest, such as CNS disorders, pain, and cancer. We have generated a library of 301 fractions from 37 field-collected cyanobacterial samples and screened these fractions against a panel of CNS receptors using radiolabeled ligand competitive-binding assays. Upon analysis of the binding activity, we found that a significant amount of our cyanobacterial extracts and fraction hit at the sigma 2 receptor. Sigma 2 has been known to be involved in CNS disorders and pain, as well as being upregulated in certain types of breast cancer, specifically, Triple Negative Breast Cancer (TNBC). For these reasons, certain cyanobacterial fractions with sigma 2 binding activity were prioritized and studied further using high-performance liquid chromatography, mass spectrometry, and nuclear magnetic resonance. Additionally, we found that fractions with a high affinity for sigma 2 had a significant cytotoxic effect on TNBC cell lines. The goal of this poster is to summarize our current analysis and results of cyanobacterial extracts with sigma 2 and TNBC cytotoxicity.

10: Anxiety and Climate Change

Amanda Kolson

Psychology | McAnulty College and Graduate School of Liberal Arts | Senior

Faculty Advisor: Alexander Kranjec, Ph.D.

ABSTRACT: This research project analyzes the anxiety levels of Duquesne University undergraduate students in regard to current climate change crises. Recent research and news articles have begun to take note of the rising levels of anxiety in clients and correlating this increase with impending environmental challenges. Environmental dangers, such as overpopulation, pollution, destruction of ecosystems, and the increasing carbon dioxide in the atmosphere, are contributing to changes in individuals' mental health. College students, who will continue to live and work in the climate crisis, may provide insight to differing anxiety levels as a result of impending climate challenges. In order to analyze the correlation between anxiety and climate change, participants completed a 10 question, anonymous

self-reporting survey. These questions were designed to gauge how much anxiety is attributed to varying climate crises that directly affect human populations, as well as climate crises that are more indirect. An example of this would be the varying anxiety levels as the result of human population leading to diminished access to freshwater resources versus coral bleaching. This research project is currently underway, and results have not been fully analyzed yet.

***11: No Human is Illegal: The study of Anti-Homeless and Hostile Architecture**

Jason Minicozzi

Political Science, Sociology, Philosophy | McAnulty College and Graduate School of Liberal Arts |
Sophomore

Faculty Advisor: Kathleen Roberts, Ph.D.

ABSTRACT: Homelessness is no longer an ‘issue’, it is a global crisis. Humans across the world suffer from a lack of shelter. Issues range from battling inclement weather, being victims of violent crimes, or lacking protections for belongings. In Pittsburgh, the homeless face a shortage of living spaces and necessary survival resources. Increasingly, hostile architecture makes certain environments uninhabitable, in that it inhibits the usage of a public amenity. These obstructions include armrests in the middle of a bench, lids atop a trash can, and spiked ledges. Anti-Homeless architecture has evolved to become more covert as a result of public backlash. Hostile architecture differs from anti-homeless architecture as hostile architecture, such as spikes, are more apparent; whereas anti-homeless architecture is discrete. My research identifies inhibitive architecture as well as the regions within Pittsburgh that this architecture appears. This essay will explore the ways to redesign architecture as less hostile, along with how to provide refuge for those without homes.

12: JFCS

Julie Downs, Alexa Ambrosino, Catherine Becker

Occupational Therapy | Rangos School of Health Sciences | Senior

Faculty Advisor: Ann Stuart, OTD

ABSTRACT: Refugee youth experience difficulty in acclimating to life in a new country both due to language barriers, past trauma and the stress of culture shock. Occupational Therapy can play a key role in helping refugee youth to acclimate to their new living contexts. Jewish Family and Community Services (JFCS) is a nonprofit organization that supports refugees by helping them find homes, jobs, and practice language skills. One component of JFCS is the Bridge Builder’s Crew, which is a virtual after-school program that focuses on improving literacy skills, social participation, and mental health in refugee children in grades 2-5. Occupational therapy has helped create client-centered interventions to further the social participation, health and wellbeing, and psychosocial functioning of the refugee youth. Specifically, we have utilized the KAWA model, Trauma-Informed Care, and psychosocial interventions to enhance the experiences of the refugee youths in the Bridge Builder’s Crew. Learn more about the positive role that occupational therapy has on refugee children in our video!

***13: Are Informed Consents Really Informed in the Era of Precision Health? Impact Reading**

Level has on Consumers

Mary Marlett, Cassidy Scassa
Nursing | School of Nursing | Senior
Faculty Advisor: Rebecca Kronk, Ph.D.
Additional Authors: Dr. Kim Subasic

ABSTRACT: In the era of precision health, increasing amounts of information from genomic research and evidence-based recommendations are being presented to the public. It is essential that resource materials and consents for genetic testing are created and tailored knowing that half of U.S. adults read at a 7th grade level or lower. The aim of this study is to explore the reading levels of various consent forms for genetic testing that are widely available to the public on Google. Gathering this knowledge will provide baseline information on whether consents are written at a reading level tailored to the U.S. population. Insights gained from this study may lead to efforts to promote genetic literacy in the era of precision health. This study employed an exploratory, cross-sectional design. A search on Google found 36 consent forms that met inclusion criteria. Descriptive and correlational analyses were applied, along with the Flesch-Kincaid reading scale. Moderate to strong correlations occurred between words per sentence and grade reading level. Average grade reading level ranged from 10.6-22. Based on these preliminary findings, we recommend the use of readability tools when writing genetic consent forms to ensure the “informed” consent process is actually informative and ethically sound. Future research includes educating healthcare providers on consumer genetic literacy.

14: Assessing Genetic Diversity Between Wild and Captive turkeys (*Meleagris gallopavo*) in Pennsylvania

Savannah Nguyen
Forensic Science and Law | Bayer School of Natural and Environmental Sciences | Senior
Faculty Advisor: Lisa Ludvico, Ph.D.

ABSTRACT: Savannah Nguyen¹, Nicole Chinnici, M.S., C.W.F.S.², Lyndsie Ferrara, Ph.D.¹, Lisa Ludvico, Ph.D.¹

¹Forensic Science & Law Program, Duquesne University, Pittsburgh, PA 15282, USA.

²Dr. Jane Huffman Wildlife Genetics Institute, East Stroudsburg University, East Stroudsburg, PA 18301, USA.

The wild turkey, *Meleagris gallopavo*, endemic to North America, is a common and popular game species. Though the species is native to North America and has an important history, there remains inadequate knowledge in assessing genetic differences in identifying domestic vs. wild turkeys. Fortunately, the development of a Short Tandem Repeat (STR) primer panel for the wild turkey has been complete (11 loci). In this study, amplification of microsatellite regions in wild and captive turkeys using STRs may reveal genetic differences, and maybe reveal changes due to domestication. It is expected that diversity is more common amongst the wild turkeys and less variation is present in captive turkeys. These findings are essential as it can help identify the origins of the turkey meat- wild caught or domestic. Determining the genetic differences between wild and captive turkeys can lead to poaching charging when turkeys are hunted out of season.

Keywords: Meleagris gallopavo, Wildlife forensics, genetic diversity, STR analysis

15: Belief in Sexism Shift: Does Child Gender Predict a New Kind of Sexist Belief in Parents?

Megan Dell (Music/Psychology), Fabiola de Jesús (Biology & Psychology), Melanie Souriyavong (Psychology)

McAnulty College and Graduate School of Liberal Arts | Mary Pappert School of Music | Bayer School of Natural and Environmental Sciences | Junior

Faculty Advisor: Alex Kranjec, Ph.D.

ABSTRACT: According to a recent study by Zehnter et. al (2020) the belief in sexism shift (BSS) represents a shift from believing in anti-female sexism toward a new kind of anti-male sexism. Due to women's advancements in society, some have come to believe that discrimination against men is on the rise. These beliefs are centered on an assumption of male victimization, and as such, may be considered a new form of sexism itself. The original study focused on the consistency of the BSS scale across participant gender. The current study examines the BSS beliefs of parents and more specifically how the gender of their child(ren) affects their beliefs. Survey data will be collected using Qualtrics. Main analyses will examine correlations between child gender, strength of child relationship, and BSS scores. Political and religious affiliations will also be collected to observe how they moderate correlations. The results of this study will highlight how differences in family structure, parent relations, and the endorsement of gender roles in children can affect the belief in sexism shift. We are especially interested in whether women endorse these new sexist beliefs to protect the interests of their male children.

16: Assessment of Sex-Equity in Concussion Identification, Diagnosis, and Recovery Among Collegiate Athletes

Grace Muccio, Priyanka Mitta

Biology | Bayer School of Natural and Environmental Sciences | Junior

Faculty Advisor: Erica Beidler, Ph.D.

Additional Authors: Erica Beidler, Ph.D. (faculty)

ABSTRACT: Recent studies have revealed the presence of sex-based differences among collegiate athletes in their concussion knowledge, reporting behaviors, and their injury recovery. These findings coupled suggest that there could be sex inequities in sports medicine coverage and concussion care at the collegiate level. The purpose of this study was to evaluate the management of concussions between male and female collegiate athletes by comparing on-site sports medicine coverage, removal mechanism from play, acute symptom burden, and recovery timelines after diagnosis. We retrospectively extracted diagnosed concussion information from collegiate athlete medical records for injuries that occurred from 2015-2020 in one NCAA Division-I university athletics program. There were 131 total diagnosed concussions captured with 49.6% (n = 65) being sustained by a female athlete and 50.4% (n = 66) sustained by a male athlete. For analyses we will assess differences between male and female athletes for on-site sports medicine coverage, the mechanism in which they were removed from play, their total severity of symptoms within the first 72-hours of injury, and the days between the time of injury and diagnosis, symptom resolution, and full return to athletics. The findings from our

investigation will add to the literature regarding sex differences in concussion recovery, as well as lend new information regarding the level of sports medicine coverage that has historically differed between women's and men's sports. Our hope is that information from this study will aid in promoting more equitable care for all collegiate athletes.

***17: Building Self-Determination: Supporting Students with Intellectual Disability in Higher Education and Beyond**

Lindsay Seidel, Erica Glaneman

Occupational Therapy | Rangos School of Health Sciences | Senior

Faculty Advisor: Meghan Blaskowitz, DrPH, MOTR/L

Additional Authors: Meghan Blaskowitz, DrPH, MOTR/L (faculty), Alia Pustorino-Clevenger, EdD (faculty)

ABSTRACT: Adolescents with intellectual and developmental disabilities (IDD) are subject to stigmatization, occupational deprivation, educational and employment disparities when compared to peers without disabilities. While almost 70% of students without disabilities attend college, only 29% of adolescents with IDD are enrolled in college (Think College, 2021). Inclusive post-secondary education (IPSE) programs offer a pathway to achieving higher education and employment (Grigal et al., 2021). However, the number of university IPSE programs does not meet current demand. In an effort to close these disparity gaps, Duquesne University has piloted an IPSE program, the Compass Program, with 4 students currently enrolled.

Self-determination (SD) describes a student's ability to exercise volition and control, and make their own life choices freely (Shogren et al., 2015). Students with IDD have limited opportunities to exercise choice and control; however, recent studies find students' SD increases when they participate in inclusive settings like IPSE (Dean et al., 2015). Higher levels of SD have positively predicted academic and post-school outcomes for adolescents with IDD including community participation, and employment (Shogren et al., 2015).

This presentation will provide an overview of SD and its importance for students with IDD on a college campus. Presenters will describe Duquesne's Compass Program, Pennsylvania SD data across 4 IPSE programs, and how Occupational Therapists and campus staff can support SD skills. As more adolescents with IDD pursue IPSE and employment, it is vital that higher education settings support them to build SD, thus contributing to closing disparity gaps for this population.

References:

Reference 1: Grigal, M., Hart, D., Papay, C., Wu, X., Lazo, R., Smith, F., & Domin, D. (2021). Annual Report of the Cohort 2 TPSID Model Demonstration Projects (Year 5, 2019–2020). Boston, MA: University of Massachusetts Boston, Institute for Community Inclusion.

Reference 2: Think College. (2021). Think College Search. <https://thinkcollege.net/college-search>.

Reference 3: Dean, E.E., Dunn, W., & Tomchek, S. (2015). Role of occupational therapy in promoting self-determination through Consumer-Directed Supports. *Occupational Therapy In Health Care*, 29(1), 86-95. <https://doi.org/10.3109/07380577.2014.958887>

Reference 4: Shogren, K.A., Wehmeyer, M.L., Palmer, S.B., Rifenbark, G.G., & Little, T.D. (2015). Relationships between self-determination and postschool outcomes for youth with disabilities. *The Journal of Special Education*, 48, 256-267. <https://doi.org/10.1177/0022466913489733>

18: Assessment of the Accuracy of Obtaining Facial Images from DNA

Matt Potock

Forensic Science and Law | Bayer School of Natural and Environmental Sciences | Senior Faculty Advisor: Pamela Marshall, Ph.D.

ABSTRACT: Deoxyribonucleic acid (DNA) has been one of the most commonly used and important forensic tools since its first use in the US legal system in 1987. DNA is known to contain the markers that code for specific facial features of each individual human. The purpose of this study was to sequence the genetic code and determine if an accurate 3D model of a human's face could be constructed from the code. 8 buccal swab samples were taken from volunteers of different races, ethnicities, and genders and amplified with the Verogen Forenseq Signature Prep Kit. Samples were then sequenced and analyzed with the MiSeq FGx Sequencing System and the Forenseq Universal Analysis Software. Data from this was used to create 3D facial images using the software Blender 3D. The results of this study are still in their preliminary stages, but this study hopes to find that accurate models can be created to match their real-life counterparts. The findings of this study will expand our DNA knowledge and provide a new technique for crime labs and police departments to locate and identify possible persons of interest and skeletal remains.

Keywords: DNA, Verogen, 3D Imaging

19: Biochemical conversion of acinar cells into β -like cells in the pancreas

Arian Hajihassani

Biochemistry | Bayer School of Natural and Environmental Sciences | Sophomore Faculty Advisor: Farzad Esni, Ph.D.

ABSTRACT: Diabetes is a syndrome defined by high blood glucose levels caused by either reduction in number of insulin-producing cells (Type 1 diabetes), or the ability of our cells to respond to insulin in combination with declined numbers of insulin-producing cell number (Type 2 diabetes). Thus, a cure for diabetes should entail replacement of insulin-producing β -cells. There have been tremendous efforts throughout the years to generate β -cells from different sources, not only from embryonic stem cells, and adult stem or somatic cells, but also from non- β -cells residing in the pancreas. One such cell type is the amylase-producing pancreatic acinar cell, which represent the majority of cells in the pancreas. These cells are primarily responsible for producing and secreting enzymes that would help us digest of the food we eat.

Here, we provide evidence that pharmacological inactivation of focal adhesion kinase (FAK) converts a subset of pancreatic acinar cells into insulin-producing cells in vivo. The acinar-derived insulin-producing cells invade the preexisting islets and are able to restore normoglycemia in diabetic mice.

This study may lay the groundwork for future therapeutic approaches in which patient's acinar cells could be reprogrammed to form functional insulin-producing cells.

***20: Bioprinting Molds for Tissue Engineering Scaffolds Applications**

Jessica Towns, Kiearra Saldi

Biomedical Engineering | Senior

Faculty Advisor: Bin Yang, Ph.D.

Additional Authors: Kimberly Williams, Ph.D. (faculty), Bin Yang, Ph.D. (faculty)

ABSTRACT: 3D bioprinting is a technique to develop scaffolding materials for tissue engineering (TE) applications. The majority of TE applications require soft materials for optimal cell attachment and activity but these materials (e.g., collagen, alginate) can be difficult to print into specific shapes needed for medical applications. The freeform reversible embedding of suspended hydrogels, also known as the FRESH method, was developed to address this issue. However, it is time-consuming and requires a level of expertise. The aim of this study was to determine whether an alternative dissolvable, cross-linked 3D printed mold was feasible for scaffold development.

An ALLEVI 1 Bioprinter and gelatin were used to produce a 2.54 cm x 2.54 cm x 2.54 cm cubic mold with a 2 mm thickness of the floor and walls. The inner walls of the mold were coated with a CaCl₂ before being injected with a 2% sodium alginate solution to assist in alginate crosslinking. The gelatin mold was then dissolved to successfully produce an alginate cube. This presentation will focus on both the mold development/printing and the injection/crosslinking steps for the gelatin/alginate system. We will also present more recent studies using polyoxamer gels as an alternative to gelatin to facilitate mold removal via a different mechanism. Ultimately we envision a system where complex molds could be printed and injected with diverse matrix materials with and without cell components.

21: Cadaver Dogs and Handlers: Detection of Ancient Bones

Hannah Cawley

Forensic Science and Law | Bayer School of Natural and Environmental Sciences | Senior

Faculty Advisor: Lisa Ludvico, Ph.D.

ABSTRACT: Not only are dogs our best companions, they are also one of the best detectors of human remains. Cadaver dogs are often brought along on search and rescue missions or to the scenes of potential crimes to help locate missing persons. They have also recently been introduced in an archeological setting to locate ancient burial grounds. In this research, the capabilities of cadaver dogs to locate ancient remains was examined through a series of six trials. It was hypothesized that the dogs would be able to successfully detect the bones at each stage. These trials used three ancient bones from Greece, dated around 580 A.D., and began with a simple detection and became progressively harder. Four handler-dog teams participated, and their success rates were recorded. Other factors affecting the success of the dogs, such as training history, experience, and potential handler error were documented. To date, no research trials have been conducted and published to assess the precision, accuracy, and reproducibility of these detections on ancient bones. This research has the potential to indicate if the previous success at burial sites was due to the scents trapped in the soil surrounding the bones, or if the dogs have precise enough capabilities to locate just the bones themselves.

22: Climate Change through the Eyes of Animals

Joe Manfre

Data Science | McAnulty College and Graduate School of Liberal Arts | Freshman

Faculty Advisor: Diana Siniora, PH.D

ABSTRACT: This project will focus largely on how animals are affected by climate change. It will be focused on how it affects habitat, food source, and population growth. The project will also look at how it affects the psychological state of different species of animals.

23: Cannabinoid Exposure in Zebrafish Affects the Efficiency of General Anesthesia

Alexa Tuzzo

Biology | Bayer School of Natural and Environmental Sciences | Senior

Faculty Advisor: Kasey Christopher, Ph.D.

ABSTRACT: Cannabis sativa (marijuana) has been used medicinally for centuries. Ancient Greek and Roman civilizations used cannabis seeds to extract cannabinoids and release pain relieving/inflammation reducing effects. An increased legalization of both medicinal and recreational use has led to an increased number of patients prepared to disclose their personal use of marijuana in the past, increasing the possibility that they will be candid about their usage when questioned by clinicians. Cannabis use may have consequences during medical treatment, such as the subjection to general anesthesia. This poster will explore the effect of using marijuana before exposure to general anesthesia and how a change in sedative dosage is necessary for avid cannabis users. Since Zebrafish have a similar genetic structure to humans, sharing 70% of genes and major organs/tissues, fully developed embryos during the hatching period were utilized to minimize the variability of the central nervous system. This poster represents the importance of honesty in medical screening evaluations to ensure proper medical treatment.

24: Computational Study of Glottal Airflow in the Larynx Model during Phonation

Durwash Badr, Isabella McCollum, Burton Carbino

Biomedical Engineering | Junior

Faculty Advisor: Rana Zakerzadeh, Ph.D.

ABSTRACT: Voice disorders have the prevalence of almost 30% in the general population and 60% in professions with high voice usage, such as educators, public speakers, and singers. Most voice dysfunctions have a one-to-one correspondence with the dynamical flow-structure interaction feature of phonation. There is thus a profound need for investigating the interaction between the glottal airflow and the vocal fold tissue to understand speech production. The objective of this work is to develop a computational model of glottal flow in a healthy larynx to analyze the fluid physics of phonation.

A three-dimensional geometry of the vocal fold was created using the modeling program, SpaceClaim. The dimensions of the model were chosen to be physiologically realistic. Navier-Stokes equations were used to simulate airflow. The framework was implemented in ANSYS CFX modeling solver to numerically

solve the simulation using Computational Fluid Dynamics (CFD) calculations. Velocity streamlines as well as both pressure and velocity contours of the glottal airflow through the larynx were obtained and analyzed. Pulsatile airflow in the larynx was also investigated with simultaneous recordings of air velocity, subglottal pressure, and volumetric flow rate.

The results of the simulation show a noticeable change of the airflow after passing between the vocal folds. The uniform streamlines entering the inlet of the vocal fold reach a maximum velocity through the neck of the model, then recirculate before exiting the outlet. The velocity gradient of the model similarly showed the highest velocity between the folds, with a steady decrease through the recirculation area. Contrastingly, the pressure gradient showed a drastic pressure drop where the velocity is highest. Results suggest that supra-glottal air velocity is highly spatially and temporally dependent.

25: Central Mammalian Fur Database

Hailey Adamik

Forensic Science and Law | Bayer School of Natural and Environmental Sciences | Senior
Faculty Advisor: Lisa Ludvico, Ph.D.

ABSTRACT: Wildlife forensics utilizes techniques and methodologies employed in human forensic science, focusing on crimes against animals including poaching and trafficking endangered species. Human forensic databases exist for DNA, fingerprints, hair, and spent bullet casings - to name a few. They are essential for reference and identification purposes, as they link the perpetrator to the crime. Although some wildlife databases exist, a large gap remains in the forensic wildlife community. One such gap is a comprehensive and fully accessible digital mammalian fur database. Knowledge of animal hair morphology is necessary for wildlife crimes, as well as domestic animal abuse, meat adulteration cases, and crime scene investigations. Mammalian species may vary morphologically in fur characteristics regarding age, region, and intraspecific variation. The existing atlases describing mammalian pelage are limited in that many are non-inclusive, non-digital, and not freely or readily available. As a result, the development of a single, digitalized database of mammalian hair would greatly benefit the field of wildlife forensics, as well as other fields of study. The macroscopic and microscopic analysis of guard hairs using Scanning Electron Microscopy (SEM) and Compound Microscopes can distinguish morphological variations to assist in species identification. These techniques can provide documentation and visual references regarding cuticle scale pattern, medullary type, pigmentation, and basic form and size of individual mammalian hairs. The implications of a singular, widely accessible fur database include providing forensic hair examiners with consistent references across the globe and allowing for the continuation of future research to aid in wildlife investigations.

26: Characterization of Metal-Peroxide Explosive Complexes Using Paper Spray Ionization Tandem Mass Spectrometry (PSI-MS)

Kayla Massari

Biochemistry | Bayer School of Natural and Environmental Sciences | Senior
Faculty Advisor: Michael Van Stipdonk, Ph.D.

ABSTRACT: Due to the growing popularity of improvised explosive devices (IEDs), bomb incidents in the United States have increased dramatically in recent years. Organic peroxides have particularly become a common agent in IEDs because they are easily accessible for purchase and are susceptible to exothermic reactions due to the instability of the peroxide bond. The goal of this project is to develop paper spray ionization - tandem mass spectrometry (PSI-MS) with collision induced dissociation (CID) for the detection and identification of peroxide-based explosives. Model compounds benzoyl peroxide and dicumyl peroxide were spiked with lithium, sodium, and potassium alkali metal cations, and also pipetted onto silver-impregnated filter paper (SIP). These samples were ionized utilizing the Thermo Scientific LTQ-XL, and the fragmentation patterns of the metal-peroxide complexes were investigated using CID at the MS2 stage. Density functional theory (DFT) calculations at the B3LYP/6-311+G(d) and B3LYP/MWB28/6-311+G(d) levels of theory were also used to determine probable ion structures.

Initial experiments showed that both dicumyl and benzoyl peroxide formed abundant complexes with Li⁺, Na⁺, K⁺ and Ag⁺ by PSI. In general, PSI produced 1:1 metal-peroxide complexes using Li⁺, Na⁺, and K⁺. PSI also produced 1:1 and 2:1 metal-peroxide complexes using Ag⁺. Because the SIP allowed for the Ag⁺-peroxide complexes to form, a swipe sampling method will be tested with the other metal-peroxide complexes. If this method is successful, it will allow a sample to be swiped from a surface and analyzed using PSI with minimal sample preparation, thus expediting the explosives detection process.

27: Characterizing transglutaminase activity on the semenogelin I protein of humans and chimpanzees

Clancy McIntyre

Biology | Bayer School of Natural and Environmental Sciences | Senior

Faculty Advisor: Michael Jensen-Seaman, Ph.D.

ABSTRACT: Reproductive proteins found in the semen of primate species are among the most rapidly evolving proteins, presumably due to the forces of natural and sexual selection. The mode and intensity of selection is predicted to vary according to the differences in mating systems among primate species, with corresponding higher and lower amounts of sperm competition. Among reproductive proteins, semenogelin 1 (SEMG1) is the most abundant protein found in seminal plasma of humans. Human SEMG1 is a substrate for a prostate specific transglutaminase (TGM4), which forms covalent crosslinking between glutamine and lysine residues. The homologs of semenogelin proteins are responsible for the coagulation of semen into a copulatory plug in mice; a phenomenon seen in species of high sperm competition. In order to quantify biochemical differences among primate species in substrate/enzyme interaction, individual recombinant fragments of the SEMG1 protein of both humans and chimpanzees were produced in an E. coli expression system and purified by a combination of affinity chromatography methods. With these purified recombinant proteins, I identified the locations of transglutaminase crosslinking on the SEMG1 protein of humans. My data confirmed transglutaminase activity on the Ia fragment of the human protein (a fragment duplicated six times in chimpanzees in comparison to humans), allowing me to reasonably infer that chimpanzee SEMG1 proteins undergo more crosslinking activity than humans. This supports the hypothesis that natural and sexual selection have selected for more crosslinking sites in chimpanzees, promoting higher relative coagulation and copulatory plug formation.

28: Checking Your Privilege: Effects of Intersectionality in the Pittsburgh Community Abstract

Emma Patton

Biology/ Pre Medicine | Bayer School of Natural and Environmental Sciences | Junior

Faculty Advisor: Kathleen Roberts, Ph.D.

ABSTRACT: Starting in 1990, black feminist thought was officially brought to the forefront of social justice concerns and took a deep stance on the issue of intersectionality, especially that faced by black women. Some of the issues that began to slowly arise included “the utility and limitations of its various metaphors, including the road intersection, the matrix, and the interlocked vision of oppression” and were quickly taken on by a prominent black feminist, Kimberle Crenshaw. The dominance of intersectionality is one that is oppressed to the naked eye, but with a closer look, it is one of the most blatantly obvious downfalls of our society. Crenshaw explains that “intersectionality has traveled into spaces and discourses that are ... constituted by power relations that are far from transparent” which in turn can be seen in our surrounding communities. Bringing this research and thought back to our own communities is what makes movement in issues such as this and can be seen immensely in the Pittsburgh community. Different organizations in the Pittsburgh area have taken their own approaches on intersectionality and are demanding change by utilizing different methodologies. ACH Clearpathways run by Tyian Battle utilizes the arts and increased educational support to enhance the surrounding community and offset the effects of low socioeconomic status, racial inequalities, and poor education system. Through their promotion of the arts and Battle’s personal experience, the story of intersectionality through a black feminist lens is laid out right here in the Pittsburgh area. Through further research and understanding of ACH Clearpathways and the demographics of the Pittsburgh area, intersectionality is finally given the attention it deserves. With this information and historical textual research, intersectionality in our own area will and can be better understood.

***29: Comparison of the Accuracy of Satellite Precipitation Measurements to Ground Precipitation Gages in South Africa**

Marie Sullivan

Environmental Science | Bayer School of Natural and Environmental Sciences | Sophomore

Faculty Advisor: David Kahler, Ph.D.

ABSTRACT: Precipitation data are needed for water resources management in agriculture and for drought and flood models. The Limpopo River Basin of southern Africa has a sparsely distributed precipitation gage network. Global Precipitation Measurement (GPM) mission uses satellites to take temporally (daily) and spatially distributed measurements. To validate the GPM data, they were compared to standard precipitation gage data in R. The data were compared at a range of temporal and spatially averaged resolutions. The results showed that precipitation measurements from satellites are reliable when the area covered is fairly large. This accuracy wanes as the areas become more precise. The GPM daily measurements were less accurate compared to the GPM monthly measurements.

30: Student withdrew.

31: Construction of a Simulated Breathing Apparatus for Drug Detection in Surgical Masks using Paper Spray Ionization - Mass Spectrometry

Christopher Farmen

Forensic Science and Law | Bayer School of Natural and Environmental Sciences | Senior

Faculty Advisor: Michael Van Stipdonk, Ph.D.

ABSTRACT: A simulated breathing apparatus (SBA) was constructed to emulate the deposition of aerosol from breath onto a surgical mask. The surgical mask was then directly analyzed through paper spray ionization – mass spectrometry (PSI-MS). Caffeine, theobromine and taurine were analytes of interest, and detected through PSI-MS. Their respective identities were confirmed through the comparison of reference fragmentation pathways of the precursor ions found experimentally from PSI-MS via collision-induced dissociation (CID). Additional quantitative results can be observed for caffeine, performed through an internal standard curve. Ultimately, the results prove that breath excretion analysis, with this novel method, can be used in drug detection investigations and requires further study to understand its capabilities.

33: eDNA detection of *Lycorma delicatula* using various forensic swabs via STR analysis

Maeve Picariello

Forensic Science & Law | Bayer School of Natural and Environmental Sciences | Senior

Faculty Advisor: Lisa Ludvico, Ph.D.

ABSTRACT: Maeve Picariello, B.A.¹, Brian Delius, Ph.D.², Jay Losiewicz, M.A.³, Lisa Ludvico, Ph.D.¹

¹ Forensic Science and Law Program, Duquesne University, Pittsburgh, PA 15282, USA

² Department of Biological Sciences, Duquesne University, Pittsburgh, PA

³ Pennsylvania Department of Agriculture, Bureau of Plant Industry, Harrisburg, PA

The purpose of this study was to determine the most effective forensic swab for detecting the presence of the invasive insect *Lycorma delicatula* early into its invasion to prevent it from spreading and causing significant environmental damage. This objective was addressed by utilizing short tandem repeats (STRs) to identify the insects in environmental samples. It was previously established that *L. delicatula* release an excretory fluid that contains DNA that can be collected from nearby tree and leaf surfaces (Valentin et al., 2020). Environmental DNA (eDNA) was collected on Duquesne University's campus using three types of forensic swabs, which were compared based on their ability to collect intact DNA for accurate and early detection of *L. delicatula*. eDNA was extracted from the swabs and compared to reference DNA extracts from field-collected *L. delicatula* individuals to determine the presence of *L. delicatula* DNA in the eDNA samples. *L. delicatula* were identified by STR markers using a species-specific assay. It is predicted that the double-swabbing technique using cotton swabs will most accurately detect the presence of *L. delicatula*. This study integrates the fields of environmental science and forensic science by using DNA collection tools from forensics to perform environmental science methods for DNA collection. Additionally, this research contributes to the field of wildlife forensics by creating a connection between invasive species management and the legal science of forensics.

Keywords: environmental DNA (eDNA), *Lycorma delicatula*, STR analysis, environmental forensics, invasive species

References:

Valentin, R. E., Fonseca, D. M., Gable, S., Kyle, K. E., Hamilton, G. C., Nielsen, A. L., & Lockwood, J. L. (2020). Moving eDNA surveys onto land: Strategies for active eDNA aggregation to detect invasive forest insects. *Molecular ecology resources*, 20(3). doi:10.1111/1755-0998.13151

34: Effect of variation at the RLN2 promoter on expression of human relaxin

Taylor McClure (Forensic Science & Law), Abigail Maus (Biology), Megan Stone (Psychology)
McAnulty College and Graduate School of Liberal Arts | Bayer School of Natural and Environmental Sciences | Junior
Faculty Advisor: Michael Jensen-Seaman, Ph.D.
Additional Authors: Lindsay Loughner, M.S.

ABSTRACT: Preterm birth is the largest factor associated with neonatal death in the United States. Among the various risk factors contributing to preterm delivery is genetics. Studies have shown an association between genetic variation at the relaxin 2 (RLN2) gene of the mother and preterm birth. This gene codes for the hormone relaxin, which moderates various pregnancy-related changes to the body, primarily in fetal membranes and tissues at the cervix at the onset of labor. In order to examine variation at the RLN2 promoter region, four alleles that differ in the length of a microsatellite found within this ~1kb promoter were amplified from human genomic DNA and cloned into the pNL1.1 luciferase reporter vector. These constructs were transfected into human placental JAR cells growing in vitro. A luciferase reporter assay was used to measure the level of transcription driven by these promoters. The differences in expression observed, along with potential implications for susceptibility to preterm birth, will be discussed.

35: Defining key amino acids for RsmE's function in *Pseudomonas fluorescens*

Jiahao Fu
Biology | Bayer School of Natural and Environmental Sciences | Senior
Faculty Advisor: Wook Kim, Ph.D.
Additional Authors: Meghan Wells, Collin Kessler, Anton Evans

ABSTRACT: RsmE is a protein in the bacterium *Pseudomonas fluorescens* that represses the production of extracellular secretions by inhibitive mRNA binding. In our experimental system, random mutations naturally occur within rsmE that correlate with elevated fitness. We predict that single nucleotide substitutions that alter the amino acid sequence will also alter the protein's ability to bind to the cognate mRNA, manifesting a range of deregulation and differential production of individual secretions. Thus, we expect mutants that produce more secretions to outcompete those that produce less or no secretions. To test this, we first inserted kanamycin and streptomycin resistance genes into 16 missense mutants of rsmE, resulting in the creation of two new antibiotic resistant strains for each mutant. Then, we began a round-robin tournament of select rsmE mutants to assess their competitive advantage. Our results thus far show a spectrum of relative fitness, indicating a range of altered RsmE

function. Once we complete the competitions of all mutants in our library, select strains across the competitive scale will be utilized to determine differential mRNA binding and secretion production.

36: Exploring Judgments of Moral Responsibility for Coronavirus Hospitalization

Jennifer Paul, Kalynn Reese, Mara Voytek

Psychology | McAnulty College and Graduate School of Liberal Arts | Junior

Faculty Advisor: Alex Kranjec, Ph.D.

ABSTRACT: The current study investigates intergroup conflict during the ongoing global pandemic. One's dedication to their in-group can affect how they view other outgroups. As the out-groups are mostly viewed negatively, people sometimes feel schadenfreude, pleasure at the price of another's pain, when the outgroup experiences an unfortunate event. Recently, a vaccine was created to combat the effects of COVID-19. People choose to get it, or not to get it for various reasons. One's decision to get the vaccine or not may influence how they judge others who suffer negative health outcomes resulting from COVID-19. Moral judgments may be influenced by diverse ideologies, like trust in scientific expertise or the idea that only the strong survive in nature. These ideas may influence how people perceive the health situations of others. The current study explores how different beliefs associated with distinct ideologies influence moral judgments about people suffering from COVID-19. Participants will be randomly assigned to one of four COVID-specific scenarios. In each scenario, a COVID patient's (Patient-X) individual circumstances around contracting COVID and becoming hospitalized are manipulated. Patient-X can be either STRONG or WEAK; VACCINATED or UNVACCINATED. Each participant will be asked to assign personal responsibility to Patient-X. Of most interest is the relationship between moral judgments of Patient-X, a participant's political party affiliation, and their vaccination status. We hypothesize that people with more liberal views will prioritize vaccination status in their judgment of the patients; people with more conservative views will prioritize the inherent strength or weakness of the patient in their judgment of Patient-X and will feel less empathy toward Patient-X in vaccinated scenarios. Findings will aid the investigation of intergroup relations and their effects on the individual, as well as gain insight into the polarization of the political parties during the ongoing pandemic.

37: Developing a Method for Identifying and Quantifying Cannabinoids on LC/QqQ/MS

Jessica Thompson

Forensic Science and Law | Bayer School of Natural and Environmental Sciences | Senior

Faculty Advisor: Stephanie Wetzel, Ph.D.

ABSTRACT: Cannabis sativa L., better known as cannabis, has sparked controversy for decades due to the psychoactive activity of the best-known cannabinoid, (-)-trans- Δ^9 -tetrahydrocannabinol (Δ^9 - THC), however there are more than 200 other cannabinoids that have been used for medicinal benefits since 2700 B.C. Cannabinoids interact with the body through the endocannabinoid system which connects the central nervous system, the immune system, and the brain. Current research shows numerous medicinal benefits from the less prevalent cannabinoids, creating a need for a method to both identify and quantify for accurate labelling and dosage information for medicinal marijuana products. A quantification method for THC and CBD from saliva was developed with liquid

chromatography/ triple quadrupole/ mass spectroscopy due to the sensitivity of the instrument. The method was further optimized and expanded to include lesser-known cannabinoids such as CBG, CBC, CBN, AND THC-O, as well as synthetic cannabinoids if time allows.

Keywords: cannabinoids, liquid chromatography, mass spectroscopy, endocannabinoid system

38: Exploring the Relationship Between Benign Masochism and Creativity

Julia Weber (International Business and Psychology), Alex Scheetz (Biochemistry and Psychology)

College and Graduate School of Liberal Arts | Senior

Faculty Advisor: Alex Kranjec, Ph.D.

Additional Authors: Alex Kranjec, Ph.D. (faculty)

ABSTRACT: Benign masochism is the idea that people gain satisfaction from inherently unpleasurable experiences, such as sad movies, massage pain, and spicy food. This idea was originally presented by Paul Rozin who developed a Benign Masochism scale. The survey presents participants with a number of experiences and asks to rate them. Little is known about the individual factors that predict differences in benign masochism. The current study looks at the relationship between benign masochism and creativity. Participants will complete the Divergent Association Task (DAT) to measure their creativity, and the benign masochism scale adapted from Rozin (2013). In the current study, the benign masochism scale consists of a list of 38 randomly presented experiences. Each will contain a scale from 0 to 10 regarding the level of satisfaction or enjoyment the participant receives from the listed item or behavior, with 0 being “not at all” and 10 being “as much as I like anything.” In the event the participant is unfamiliar with a given item or behavior, the option “Not familiar with this item” will be offered for the participant to select. Individual scores for each participant will be averaged to obtain an overall estimate of the person’s preferences. This average will be correlated to their creativity score to better understand the relationship between creativity and benign masochism. We predict that individuals with high creativity will be more likely to enjoy experiences of benign masochism. Creativity is linked to several common “antisocial” personality traits like dishonesty. Exploring how creativity relates to benign masochism can further our understanding for how so-called positive and negative character traits interact.

39: Development and testing of novel antibiotics for antimicrobial tendencies

Remy Pastierik (Biology), Pratham Patel (BioChem)

Bayer School of Natural and Environmental Sciences | Junior

Faculty Advisor: Nancy Trun, Ph.D.

ABSTRACT: As antibiotic resistant microbes increase, there is a need for the development of novel antibiotics. Fully functionalized small molecule probes were synthesized in order to be pharmacologically evaluated. The advantage of these fully functionalized small molecule probes is that they can rapidly identify new chemical probes and drug targets for the treatment of infectious disease, as target identification is a rate limiting step in antibiotic discovery. Thirty-three newly synthesized potential antibiotic compounds were screened for antimicrobial properties using a disc assay against a gram-negative E. coli and gram-positive Bacillus. Of the initial thirty-three compounds, eight showed

potential as novel antimicrobials and were further tested in a minimal inhibitory assay to determine the lowest effective concentration of each compound. From the minimal inhibitory assay, six compounds were determined to have antimicrobial activity. These six compounds will be further tested and modified to increase their efficacy.

***40: Enhancing caring behaviors among undergraduate nursing students in the clinical learning environment: An integrative review**

Meredith Hill

Nursing | School of Nursing | Senior

Faculty Advisor: ERGIE INOCIAN, EdD

ABSTRACT: Background: Caring is a fundamental aspect of nursing practice. However, factors in the clinical learning environment (CLE) that help shape the caring behaviors of nursing students as part of their education journey remain understudied.

Study Purpose: This integrative review aimed to explore existing literature on the factors influencing caring behaviors among undergraduate nursing students in the CLE.

Methods: We conducted a comprehensive search of four databases (CINAHL, PubMed, Scopus, and Embase) using the following search terms: “nursing students OR nursing undergraduates OR student nurses” AND “clinical learning environment” AND “caring behavior.” The inclusion criteria were: studies published from 2011 to 2021 in peer reviewed journals with full text, English language, and explored caring behaviors in the CLE.

Findings: This integrative review identifies 5 factors that may enhance caring behaviors among nursing students in the CLE: role modeling of clinical faculty and professional nurses, creating a conducive CLE, communication, simulation experience, and alternative clinical placements.

Discussion: Empirical evidence was drawn from 11 studies including seven qualitative designs, three quantitative designs and one mixed method design. This review suggests that the CLE is essential to the development of caring behaviors among nursing students. Improving nursing students’ clinical learning experiences and caring abilities may promote better patient outcomes. Conclusion: The findings generated from this review may assist to create meaningful clinical learning experience among nursing students by formulating and implementing effective teaching and clinical strategies to enhance their caring behaviors thus facilitating their preparation for the professional nurse role.

Keywords: Caring behaviors, Clinical learning environment, Clinical Placement, Communication, Nursing students, Role Modeling, Simulation

41: Effects of Pesticides and Stress Hormones on Amphibian Liver Function

Madison Mellott

Biology | Bayer School of Natural and Environmental Sciences | Junior

Faculty Advisor: Sarah Woodley, Ph.D.

ABSTRACT: Contamination of wetland habitats by sublethal toxins, like pesticides, are causing amphibian populations to decline worldwide. This exposure to toxins and contaminants induce a stress response in amphibians that can lead to major health effects. Exposure to stress hormones like corticosterone (CORT) and pesticides like chlorpyrifos (CPF), can impact the physiology and histology of livers in tadpole anurans. Little is known about how these environmental stressors affect the physiology and histology of amphibians. I am testing the hypothesis that exposure to CPF has damaging effects on liver function in tadpoles (Leopard Frogs, *Lithobates pipiens*). To do so, I am examining livers from tadpoles exposed to either CPF, corticosterone (CORT), or a vehicle control. I predict that there will be changes in liver hepatocyte shape, nucleus content, and lipid content in both CORT and CPF treated tadpoles. I am staining liver cells using hematoxylin and eosin (H & E) and periodic-acid Schiff (PAS). I will assess liver morphology and carbohydrate and fat content using ImageJ. This will contribute to our knowledge of how trace amounts of pesticides might impact liver development. My results in tadpoles may offer insight to possible causes of amphibian declines.

42: Engineered Extracellular Vesicles with Enriched Mitochondrial Load

Duncan Dobbins

Pharmacy | School of Pharmacy | Senior

Faculty Advisor: Devika Manickam, Ph.D.

ABSTRACT: Mitochondrial dysfunction is a hallmark of numerous brain disorders, including ischemic stroke. Stroke-induced mitochondrial damage in brain endothelial cells (BECs) results in cell death and aggravates post-stroke outcomes. Therefore, exogenous delivery of mitochondria into BECs is a promising approach to increase cell survival. Our prior work demonstrated that EVs contain functional mitochondria and mitochondrial components. We showed EVs transfer mitochondria to recipient human BECs and mouse brain slice neurons. EV-mediated mitochondrial transfer showed greater cell survival via increased mitochondrial function in the recipient BECs. Encouraged by these findings, we wanted to further increase the mitochondrial load in EVs (mito-EVs) by increasing mitochondrial biogenesis in the donor cells.

We activated peroxisome proliferator-activated receptor-gamma coactivator-1 α (PGC-1 α), the central mediator of mitochondrial biogenesis, in the donor cells. We hypothesized that mito-EVs may further increase ATP levels in the recipient BECs compared to naïve EVs isolated from control, non-activated cells. We treated NIH/3T3, a fibroblast cell line and hCMEC/D3, a human BEC line using resveratrol to activate PGC-1 α , prior to isolating mito-EVs. We characterized mito-EVs and naïve EVs for their particle diameters, EV particle concentration and determined their uptake and resulting ATP levels in the recipient BECs. Interestingly, mito-EVs showed increased particle size, EV particle concentration, and BEC ATP levels compared to naïve EVs, suggesting an increased mitochondrial load in the mito-EVs. In addition, mito-EVs transferred more mitochondria into recipient BECs.

In conclusion, mito-EV-mediated delivery of mitochondrial components is promising strategy to increase cell survival in mitochondrial dysfunction disorders, including ischemic stroke.

43: Development of a Conserved Semenogelin I and II Epitope for Semen Identification with Respect to Allelic Variation

William Gibbs

Forensic Science and Law | Bayer School of Natural and Environmental Sciences | Senior
Faculty Advisor: Michael Seaman, Ph.D.

ABSTRACT: Seminal fluid is a source of biological evidence used for DNA analysis. Semen identification may be difficult in many instances, such as sexual assault cases. Accurate identification of semen is crucial for preservation and DNA analysis, a necessity for positive identification. The highly abundant semenogelin proteins are used as a marker in the Rapid Stain Identification Series (RSID) semen assays. There are currently no readily available studies analyzing the effects of allelic variation on RSID-semen assays. Therefore, semenogelin I (SEMG1) and semenogelin II (SEMG2) known allelic variants were computationally analyzed. This was done using publicly available databases of human genome allelic variants. The data was used to identify an optimal peptide fragment (LJG fragment) that was conserved in both SEMG1 and SEMG2, with little known variation. The LJG fragment was cloned and expressed in an E. coli system by fusing the desired fragment with maltose-binding protein on the amino terminus and a hexahistidine tag on the carboxy terminus. Affinity chromatography was used to purify the expressed LJG fragment. The fragment was then prepared for antibody production of the ideal epitope for SEMG1 and SEMG2. This study showed a more reliable epitope can be produced for the RSID-Semen assays and recommends new antigens be produced for SEMG1 and SEMG2 detection. Application of this epitope may increase the accuracy of the RSID-semen assay, improving semen identification techniques.

44: How Brand Image Transformation Saved Levi's

Diya Krishna

Integrated Marketing Communications (IMC) | McAnulty College and Graduate School of Liberal Arts | Junior
Faculty Advisor: Carla Richards, Ph.D. Student

ABSTRACT: Brand image encompasses visual associations and cues that stem from brand interactions. It creates a distinct identity for an organization that consumers read into while contemplating aligning themselves with a brand. This paper divulges the crucial role brand image plays in a company's survival and success in the current market via Levi's (the apparel company) attempt to reinvent itself to succeed in the market. The research on Levi's delves into factors that influence brand image, namely, visual communication, brand messaging strategies, positioning, etc. In addition, scholarly articles explore the elements impacting brand image, providing additional recommendations and criticisms on Levi's attempt to reinvent itself. The research illustrates Levi's experience in transitioning to become a successful entity through transforming its brand image. These findings emphasize the components essential to maintaining a successful brand image, indicating the brand equity that can be built via creating a distinct brand image that speaks to consumers.

Keywords: brand, image, Levi's, communication

45: Development of a Mechanical Testing Lab to Increase Student Understanding

Christina St. Clair

Biomedical Engineering | Rangos School of Health Sciences | Senior

Faculty Advisor: Kimberly Williams, Ph.D.

ABSTRACT: Mechanical testing is essential in understanding and characterizing properties of materials to create designs and manufacture products that will be able to perform a desired function. During the last semester, I was testing stress strain properties of different materials to develop a procedure that could be used by students to help understand mechanical properties of materials.

The first part of this research was to create a method for testing stress strain using a Torbal force gauge. Tests were performed on multiple types of materials including PLA, noodle, and rubber bands. It appeared that rubber bands had the best testing qualities for stress strain due to the elasticity of the material. Multiple tests were performed with the rubber bands to create a procedure that included preparation of the sample, set up for the Torbal machine, data collection, and performance of the test. The data collected was then analyzed and compared in Matlab to determine if the method would provide a reproducible result.

From this lab, a procedure for testing stress strain was developed to be applied to biomaterials and could be used by students to understand the mechanical properties of these materials. In the upcoming weeks this, the procedure produced from this lab will be used by students to collect stress strain data and perform an analysis on the data collected.

This data will help to create a solid foundation for the experiment and in the future this lab procedure would be able to be applied to biomaterials.

46: High temperature, solid state synthesis of copper-containing diamond-like semiconductor sulfides with potential nonlinear optical applications

Megan Treece

Chemistry | Bayer School of Natural and Environmental Sciences | Junior

Faculty Advisor: Jennifer Aitken, Ph.D.

ABSTRACT: Compounds that have crystal structures related to that of cubic or hexagonal diamond are called diamond-like semiconductors (DLS). Many DLSs have optimal nonlinear optical (NLO) properties. This means that their structures and properties allow for them to be useful in NLO applications, for example, tuning lasers for medical devices as well as military defense systems. Many compounds with the formula $I2-II-IV-VI4$ have been published, but calculations show that some instability may be present in the published structure parameters. Some of the properties of these materials are not well established in the literature. Little information has been published on the structure and characterization of DLSs with the general formula $I4-II-IV2-VI7$. Using high-temperature, solid-state synthesis, compounds following the general formulae, $I2-II-IV-VI4$ and $I4-II-IV2-VI7$ were prepared. The phase purity of $I2-II-IV-VI4$ was assessed by X-ray powder diffraction and diffuse reflectance UV/Vis/NIR. Using single crystal X-ray diffraction, the samples were further characterized and analyzed against previously published structures. The sample parameters correlated strongly with published data confirming the structure, were phase pure, and the properties of this material were

determined. Further structural analysis and characterization of the I4-II-IV2-VI7 compound is ongoing. By determining the defining characteristics of these compounds, a predictive tool for identifying promising compounds may be possible.

47: Direct Synthetic Access to Organocatalysts for Alcohol Activation Using an Addition-Rearrangement Coupling (ARC) Reaction

Danielle Beres

Chemistry | Bayer School of Natural and Environmental Sciences | Senior

Faculty Advisor: Aaron Bloomfield, Ph.D.

ABSTRACT: The Mitsunobu reaction is a versatile method for coupling a primary or secondary alcohol with a pronucleophile ($pK_a \ll 11$) using stoichiometric auxiliary reagents diethylazodicarboxylate (DEAD) and triphenyl phosphine (TPP). Recent studies by Beddoe et al. have demonstrated a novel organocatalyst, based on a 2-hydroxybenzylphosphine oxide (2-HOBPO) core, which facilitated coupling of alcohols and pronucleophiles ($pK_a \ll 3.5$) without any other reagents and producing water as a sole byproduct. However, Beddoe's three-step synthesis requires harsh reagents PBr_3 , NaH, and BBr_3 , limiting the range of organocatalysts that can be accessed. Herein, we report a general single-step synthesis of 2-HOBPOs from salicylaldehydes and secondary phosphines through an addition-rearrangement coupling (ARC) reaction and demonstrate that most of the systematically varied organocatalyst candidates (>20 examples) are catalytically active. Finally, the activity and selectivity appears to be sensitive to both the substituents on the phosphine oxide and on the phenol.

48: Global Fits and Extrapolations of the Up to Down Quark Ratio Contributions to the Proton

Hannah Valenty

Physics | Bayer School of Natural and Environmental Sciences | Sophomore

Faculty Advisor: Fathia Benmokhtar, Ph.D.

ABSTRACT: The MARATHON experiment ran in spring 2018 in Hall A at the Thomas Jefferson National Accelerator Facility by a large international Nuclear Physics collaboration. The experiment used two high resolution spectrometers for electron detection, and a cryogenic target system which included a low-activity tritium cell. MARATHON uses a novel method to extract the ratio of neutron to proton structure functions that allows the access to the ratio of the up to down quark contributions to nucleon structure. MARATHON performed deep inelastic electron scattering off Tritium and Helium-3 mirror nuclei over the range $x=0.195$ to $x=0.825$. Where x is the fraction of momentum carried by the struck quark.

The results of F_2^n/F_2^p from the MARATHON experiment have been released and my work performs a fit of the data to extrapolate to the $x_B=1$ limit. An overview of the MARATHON experiment, the fits and extrapolation work I performed will be presented.

49: How does the Harry Potter series connect to Plato's belief in the immortality of the soul

and finitude of the body?

Julia Strimling

Nursing | McAnulty College and Graduate School of Liberal Arts | Freshman

Faculty Advisor: Daniel Scheid, Ph.D

ABSTRACT: Plato has long been acknowledged for his significant role in the development of the Christian perspective regarding immortality. This poster demonstrates how Plato's belief in the immortality of the soul, which shaped Christian eschatology, aligns with the themes presented in the Harry Potter series. Using Plato's Phaedo, this poster will compare Plato's ideas about the immortality of the soul to how J. K. Rowling portrays immortality, illuminating the presence of Christian thought in the famous Harry Potter series. These connections include the beliefs that the soul survives the physical death of the body, that one must nourish and protect their soul, that one must accept death when the time comes, and that a form of judgement occurs upon death which determines the destination of one's soul. Rowling includes the sorcerer's stone, the horcruxes, and the deathly hallows to show that Voldemort's desire to live forever is sinful and that Harry's abandonment of physical immortality virtuous.

50: Examining Differences in Exonerations across the United States

Alexys Karl

Forensic Science and Law | Bayer School of Natural and Environmental Sciences | Senior

Faculty Advisor: Lyndsie Ferrara, Ph.D.

ABSTRACT: Since the methodical tracking of exonerations began in 1989, there have been 2,937 recorded exonerations. Advocacy groups, like the Innocence Project, Centurion, and conviction integrity units (CIUs) are becoming more and more prominent across the United States and are credited with a proportion of those 2,937 exonerations. Despite their success, little is known about the relationship between advocacy groups and certain differences in exonerations by location, offense type, crime rates and prison populations, etc. Most published literature regarding exonerations focuses on the causes of wrongful convictions, while there are almost no studies that investigate the effects of advocacy groups on exoneration differences. Using the National Registry of Exonerations database, as well as the Innocence Project, Centurion, and CIU databases, data sets were gathered and subjected to statistical analysis and comparison to identify important trends. Further analysis of advocacy groups was performed through interviews with members of such organizations, including prosecutors, defense attorneys, and executive board members. Any knowledge about exoneration is imperative to future correction and conviction integrity. A precise representation of exoneration trends, as well as an accurate model of advocacy groups will lead to the optimization of their success.

51: Evaluating Racial Differences in Concussion Diagnosis and Recovery in Collegiate Athletes

Anusha Kikani (Physical Therapy), Natalie Bell (Biochemistry)

Rangos School of Health Sciences | Bayer School of Natural and Environmental Sciences | Junior

Faculty Advisor: Erica Beidler, Ph.D.

Additional Author: Spencer DeMedal (Graduate Student)

ABSTRACT: Prior research has shown racial differences in concussion knowledge/awareness, injury reporting/disclosure, recovery, and return to school. Racial disparities in traumatic brain injuries have been observed in varying populations from children and adolescents to collegiate young adults. However, there is limited research specifically looking at race as a modifying factor for concussion in collegiate athletes. Therefore, the purpose of this investigation was to determine if there are differences in sports medicine access, mode of removal from play, symptom severity, and concussion identification, diagnosis, and recovery timelines between White and Black collegiate athletes. We conducted a retrospective medical chart review of 131 diagnosed concussions occurring from 2015-2020 at one National Collegiate Athletic Association Division-I institution. Of those concussions, 68.7% (n = 90) occurred to an athlete who identified as 'White', while 29.8% (n = 39) occurred to an individual who identified as 'Black'. The independent variable of interest for this study was racial identity (White, Black) and the dependent variables were immediate on-site access to an athletic trainer at the time of injury (yes, no), mode of removal from play (self-removed, removed by someone else), acute concussion symptom severity score, and the number days between the date of injury and diagnosis, symptom resolution, and full return to athletic participation. The results of this study may provide important insight into the presence or lack of racial disparities in healthcare that will inform future equitable approaches to concussion awareness and management in collegiate athletics.

52: Extraction and Quantification Method of Methamphetamine and Metabolites from Vitreous Fluid via LCMS/MS-QQQ Analyzation

Erika Sobol

Forensic Science and Law | Bayer School of Natural and Environmental Sciences | Senior
Faculty Advisor: Stephanie Wetzel, Ph.D.

ABSTRACT: An efficient way to extract and quantify methamphetamine (MAMP) and its metabolites, amphetamine (AMP) and parahydroxymethamphetamine (PMAMP), has not been developed for vitreous fluid via Liquid Chromatography Mass Spectrometry (LCMS/MS-QQQ) analyzation. MAMP is one of many illegal drugs that affect the population in the United States through addiction, illegal sale, prisons, etc. Methods of testing and tracking MAMP and its metabolites in post-mortem testing has not been explored to help combat drug related overdoses. This study is focused on multiple extraction techniques of MAMP, AMP, and PMAMP from vitreous fluid using solid phase extraction to isolate each drug. The samples are then analyzed via the LCMS/MS-QQQ and in turn, utilized to quantify the drugs. Future research needs to be focused on low cost, efficient approaches to test for MAMP and metabolites in vitreous fluid to reform drug testing done in the criminal justice system through toxicology laboratories.

Keywords: methamphetamine, vitreous fluid, post-mortem toxicology

53: Identity Formation and the Immigrant Experience

Renne Cabacungan

Psychology | McAnulty College and Graduate School of Liberal Arts | Senior
Faculty Advisor: Elizabeth Fein, Ph.D.

ABSTRACT: Immigration history is an especially prominent aspect of an immigrant’s identity. Immigration creates psychosocial changes which can impact how an individual is viewed by themselves and others. Immigrants develop a dual identity, drawing from both their new country and their country of origin. Navigating this binary lies at the heart of an immigrant’s identity development. The purpose of this study was to investigate the personal processes one undergoes during immigration in forming one’s new identity. Qualitative interviews were conducted with two participants of different nationalities. A life course theory approach structured the two interviews to create a comprehensive timeline of events and corresponding changes to how they viewed their identities. Both immigrants moved to America from their homelands. One participant was a female of Filipino origin, and the other participant was a male of Iranian origin. The poster will discuss common themes that emerged across the two interviews: culture shock, initial uneasiness, and adapting to new life through professions. Many differences also emerged in the areas of historical contexts and personal beliefs that created their own unique and distinct experiences. The results of this study are especially important in a time where immigration remains a very controversial issue. At a time where immigrants are often dehumanized in media, the findings can be used to emphasize the difficulties experienced by immigrants in their attempts at navigating between two different worlds and allow their stories to be properly represented.

54: Genetic Diversity in Pangolin Founder Populations

Alexa Michaels

Biology | Bayer School of Natural and Environmental Sciences | Senior

Faculty Advisor: Jan Janecka, Ph.D.

ABSTRACT: Pangolins are an endangered species considered the most widely trafficked mammal in the world. They are widely traded in the bushmeat industry and are desired for the medicinal use of their scales in traditional medicine. Native to Africa and Asia, these animals are insectivores with tough scales made of keratin, leading to the nickname “scaly anteaters”. Few exist in captivity in the US, and more information is needed for population remediation initiatives. In recent studies, microsatellite markers (STRs) have been used to study the genetic diversity of individuals to gain a better understanding of how to breed these animals as well as other conservation decisions. As part of the Pangolin Consortium, zoos in the US received wild pangolins to use as founders for future captive populations. Samples from these founders were collected on FTA cards, then isolated and genotyped. The microsatellite marker sites are being analyzed to assess variation and determine levels of genetic diversity in the founder pangolins, as well as diversity found in wild populations. These results have significant implications for captivity programs and conservation efforts. Captive populations should be maintained with the greatest amount of diversity possible to allow the species to recover, and these findings can assist with those efforts.

55: Human Trafficking: Recruitment Methods

Hannah Schaeffer

Forensic Science and Law | Bayer School of Natural and Environmental Sciences | Freshman

Faculty Advisor: Pamela Marshall, Ph.D.

ABSTRACT: The heinous phenomenon of human trafficking has become more common than people may assume, even in the United States. With this enterprise growing more rapidly each year, it's crucial that people become aware of the signs of human trafficking, as well as various grooming efforts made by traffickers that ultimately result in people falling subject to this deplorable crime. By employing information from organizations such as the Polaris Project as well as information from articles published by the FBI, among others, this poster discusses traffickers' various methods of recruiting victims. The factual evidence of this topic is explored to bring awareness to the subject of human trafficking, and this research reveals that nevertheless, it is an increasing industry that targets more people and more countries than people may know.

56: Identification and Classification of Unknown Bacterial Species from Wingfield Pines

Evan Oblak

Biology | Bayer School of Natural and Environmental Sciences | Senior
Faculty Advisor: Nancy Trun, Ph.D.

ABSTRACT: It is estimated that less than 1 percent of all bacteria species have been identified and classified. Since there are so many unknown species of bacteria, it is likely that an unidentified species will be found in every soil sample. The unknown species found in this experiment was isolated from a soil sample collected from an abandoned mine drainage (AMD) reclamation site south of Pittsburgh and named EDO2. The bacterial chromosome from EDO2 was sequenced using next generation sequencing. A genome analysis was performed using the KBase software. The data was placed into a species tree and the closest relative to EDO2 is *Tolomonas auensis*. Genome alignment was conducted against the reference genome of *T. auensis*. Growth characteristics, including temperature, pH, and oxygen levels, were determined. Chromosomal DNA was analyzed to determine the potential metabolic pathways and genes present in EDO2. The bacterium was grown on minimal media with different elements to test the metabolic pathways that were found during the gene analysis. EDO2 appears, from our tests, to be a novel bacterial species.

57: Identifying the Function of Human RECQL in Herpes Simplex Virus Type-1 Infection

Julia Gibson

Biology | Bayer School of Natural and Environmental Sciences | Junior
Faculty Advisor: Jill Dembowski, Ph.D.

ABSTRACT: Funding provided by NIH R01 – AI158361

Herpes Simplex Virus Type-1 (HSV-1) is a prevalent human pathogen, infecting close to half of the U.S. population. While the most common symptoms of this infection are cold sores, more severe cases can present with genital herpes, herpes keratitis, and encephalitis. HSV-1 infection is lifelong, entering latent periods when no symptoms are present. While HSV-1 is a common and potentially deadly virus, we do not have a full understanding of the infection process. We do know that HSV-1 utilizes both viral and cellular factors during infection and replication, several of which have been identified. Through previous studies in our lab, we discovered the presence of human RECQL during infection and replication. In uninfected human cells, RECQL acts as a helicase protein at the replication fork during replication stress.

RECQL has been seen to restart stalled replication forks, mediate annealing of complementary single-stranded DNA, and bind mismatch repair proteins. RECQL has also been active in tumor cell proliferation. However, the role of RECQL in HSV-1 infection has not yet been studied. Here, we discuss our plans to identify the role RECQL plays in HSV-1 infection. Our primary goal is to knockdown RECQL and define its function in HSV-1 infection.

58: Impact of Treatment Length on Individuals with Substance Use Disorders in Allegheny County

Cassie DiBenedetti (Data Science), Kate Rosello (Mathematics).
McAnulty College and Graduate School of Liberal Arts | Senior
Faculty Advisor: Rachael Neilan, Ph.D.

ABSTRACT: Auberle social services is opening the Family Healing Center (FHC), a level 3.5 treatment program that provides housing and 24-hour support for families struggling with opioid addiction. We partnered with Auberle to study characteristics of individuals receiving level 3.5 treatment and to determine whether longer treatment lengths correlate with fewer adverse outcomes.

We obtained data from the Allegheny County Department of Human Services on 2,016 individuals admitted to level 3.5 treatment in 2019. The data included birth year, race, gender, admittance date, discharge date, and Children Youth and Family (CYF) incidents before and after treatment. We categorized the population into three groups based on length of treatment (<14, 14-30, and 30+ days). We applied statistical tests to determine significant demographic differences between the groups. Additionally, we measured the impact of treatment in each group by examining the change in CYF incidents before and after treatment.

Results show that the average age of individuals in each group increased with treatment length. The group that persisted in treatment 30+ days contained more Black/African American individuals (33%) than the other two groups (22-23%). We found that the relative frequency of CYF cases decreased after treatment across all groups, with the largest decrease observed in the group with 30+ days of treatment. Additionally, we observed that the relative frequency of CYF placements after treatment decreased as treatment length increased.

These results will help Auberle better understand characteristics of individuals served by the FHC and demonstrate the positive impact of persistence in a treatment program.

59: Improving Forensic Science Education within a Law School Curriculum

Shelby Kmidowski
Forensic Science and Law | Bayer School of Natural and Environmental Sciences | Senior
Faculty Advisor: Lyndsie Ferrara, Ph.D.

ABSTRACT: Many, if not most, criminal lawyers and judges do not have a background in forensic science. Because of this, judges may struggle to determine what type of forensic evidence can be admissible in court and lawyers struggle to clearly communicate forensic evidence to juries. Many studies have assessed where lawyers then gain their forensic science knowledge, through Continuing

Legal Education courses or through trial experience, but very few on the implementation of forensic science courses within a law school curriculum. To address this, an online module program on forensic science was developed via Canvas to determine if the modules increased criminal law students' knowledge on forensic science. To gauge the students' knowledge before and after, a pre and post test was utilized to determine if any knowledge was gained throughout the course of the module. The pre and post test scores should show the importance of teaching basic forensic science techniques to criminal law students. If forensic science is incorporated into law school curriculums, the law students will be better equipped to handle forensic evidence in court quickly upon becoming a licensed and practicing attorney.

60: innovatIve: A unique IV removal preventative solution

Rachel Wentz (Biomedical Engineering/Nursing), Celia Gambacorta (Biomedical Engineering/Nursing), Sakina Goawala (Biomedical Engineering), Emily Meier (Biomedical Engineering), Abby Hebenton (Biomedical Engineering)

School of Nursing | Biomedical Engineering | Senior

Faculty Advisor: Leda Kloudas, Ph.D.

ABSTRACT: An unrecognized issue contributing to intravenous (IV) catheter failure is dislodgement; resulting in delay of treatment, IV reinsertion, and injury to veins. This issue is one of the most common reasons for IV failure affecting general patient safety and expenses within the healthcare system. Geriatric and psychiatric patients specifically have been seen to dislodge their IVs intentionally or accidentally due to a multitude of reasons such as confusion, delirium, or aggravation resulting from illness, infection, or other various conditions. Often, patients are restrained due to these reasons. Restraining a patient unnecessarily poses an ethical dilemma and potential neglect of human rights. We have proposed a novel medical device as a solution to decrease the number of IVs removed while also limiting the need for patients to be restrained. This device can be placed on a patient's arm, protecting the site of IV insertion. The first layer of our device involves a skin-colored, elastic sleeve applied to the patient's arm paired with a breathable dome. The outer, polymeric layer provides extra security to the device through the use of a proximity sensor that notifies a member of the healthcare team if this layer is compromised. Our device eases the strain on healthcare providers and improves the quality of life for patients who are predisposed to the intentional or accidental removal of their IV. On a larger scale, our proposed solution could improve efficiency of hospital staff and prevent the waste of valuable hospital resources, such as IV tubing, medications, or fluids.

61: Internet Ethics

Isabelle Cromer

Communications | McNulty College and Graduate School of Liberal Arts | Senior

Faculty Advisor: Carla Richards, Ph.D. Student

ABSTRACT: Internet Ethics

To practice ethical communication while using media outlets and technology, it is vital to understand the negative effects of technology progression in a global sphere. While following communication media

ethics and a “narrative” approach, ideas from Dr. Arnett’s Communication Ethics Literacy: Dialogue & Difference (2018), every individual who uses technology or the internet to communicate must be protecting and promoting the good with ethical communication to have beneficial connections. The negative impacts people suffer from everyday can include cyber harassment, security breaches, and conflicts within businesses and the education system. The growth of social media marketing and “influencer culture” (Saravanakumar, 2012) may benefit organizations through its convenience, but there are certain evils that are more susceptible to affecting an individual or organization. The aim of this essay is to explore case studies to analyze these common troubles a person can experience and place them into a global and communal perspective.

Keywords: communication ethics, narrative, social media, technology

References

Arnett, R. C., Harden, F. J. M., & Bell, L. M. (2018). Communication Ethics Literacy: Dialogue & Difference. Kendall Hunt Publishing Company.

Saravanakumar, M. (2012). Social Media Marketing. Life Science Journal, www.lifesciencesite.com/ljsj/life0904/670_13061life0904_4444_4451.pdf

***62: Intraluminal thrombus and risk of rupture in patient specific abdominal aortic aneurysm**

Alexis Throop, Nicole Bohatch

Biomedical Engineering | Biomedical Engineering | Junior

Faculty Advisor: Rana Zakerzadeh, Ph.D.

ABSTRACT: An abdominal aortic aneurysm (AAA) is a localized dilation of the abdominal aortic vessel. Aneurysms develop asymptotically over time until a sudden rupture. The mechanisms of AAA formation and rupture is controversial among literature. Consequently, developing a proper understanding of AAA behavior can lead to diagnostic tools to assess clinical outcomes of the aneurysm cases. The objective of this work is to develop a computational framework for numerical simulations of blood flow in a patient specific AAA geometry to observe the effect of ILT on model outcome. In particular, aneurysmal wall stress measures are observed. This study examined three patient specific cases with varying ILT shapes and thicknesses. These patients were compared to simulations of the same geometry but lacking the ILT. We also simulated an AAA model while comparing two methods of analysis: one with assuming a steady-state blood flow and another with transient condition to simulate a pulsatile fluid flow within the artery. For the steady state case, blood was defined with a pressure of 110 mmHg at the inlet of the artery and a mass flow rate of 0.0038 kg/s at the outlet. For the transient simulation, time-dependent parabolic velocity and pressure profiles were defined as the inlet and outlet boundary conditions, respectively. Through the implementation of a fluid-structure interaction methodology in the ANSYS software, the velocity of the blood flow induced a pressure on the arterial wall. Observations of blood velocity, total deformation, and maximum stress were made on the fully coupled model in ANSYS Workbench.

63: JO-1 PROTEIN INDUCES AUTOIMMUNE RESPONSE AND LOSS OF FORCE PRODUCTION: A MYOSITIS MOUSE MODEL

Bhoomika Sripathi

Biology | Rangos School of Health Sciences | Senior
Faculty Advisor: Matthew Kostek, Ph.D.

ABSTRACT: Myositis is a chronic autoimmune disorder which causes muscle inflammation and can be severely debilitating. There is no cure, and the cause is unknown. Yet, most patients develop autoantibodies against the Jo-1 protein (Histidyl-tRNA synthetase). There are currently no standard animal models of the disease, which hinders research. The study's purpose was to verify a myositis model using Jo-1 protein to mediate a similar immune response. Male and female mice were split into two groups. Mouse gastrocnemius muscle was injected with Jo-1 protein (experimental) or saline (control) on day 0. Muscle physiology testing was performed 10 (n=24), 21 (n=21), and 42 (n=22) days after injection, followed by hind-limb muscle collection and preservation for H&E and F480 histological analysis. A weekly endurance test was also conducted as a supplemental measure of muscular function in the 42-day groups. T-tests were used to compare group differences. All animals completed the experiment. Jo-1 mice had lower muscle force production compared to saline mice ($P < 0.05$). Peak muscle damage occurred at 21 days for both male and females. Histological analysis is ongoing but preliminary observations concur with the muscle physiology testing. Injections of the Jo-1 protein trigger inflammatory processes and consequent muscle fiber damage that are similar to clinical myositis patients.[MK1]. Injection of Jo-1 protein appears to be a good model of myositis that can be used to study the disease. Our laboratory is currently planning therapeutic trials.

64: Judge Conduct

Lauren Byers

Secondary Ed Social Studies | School of Education | Junior
Faculty Advisor: Andrew Simpson, Ph.D.

ABSTRACT: As a whole, judge conduct can influence a jurors choices due to the bias and behavior that they show in the courtroom. I believe that Judge Julius Hoffman made remarks and completed actions to construe the jury by belittling the defense, tying, and gagging a defendant, as well as making racist remarks. I chose to make this argument because it is quite clear that Judge Julius Hoffman was not unbiased in this trial. In many parts of the transcript, the defense asks for this judge to step down from the case due to his remarks and lack of respect for the defense.

65: LGBTQ+ Inclusion in a Catholic Setting

Antonio Battista

English/Education | McAnulty College and Graduate School of Liberal Arts | Sophomore
Faculty Advisor: Emad Mirmotahari, Ph.D.

ABSTRACT: The paper will explore the current relationship between the Catholic Church and the LGBTQ+ community and the theological basis on which that relationship could be improved upon. First, data is shared that illustrates the negative effects current Catholic rhetoric has had on the LGBTQ+ community, especially in young people. Then, Catholic Social Teaching and Catholic perspectives on sexuality education are examined to find areas of commonality between the two groups so that a dialogue of respect may emerge.

66: Measurements of Beam Single Spin Asymmetries in the $ep \rightarrow e'p'X$ reaction in CLAS12

Devin O'Neill

Physics and Math | Bayer School of Natural and Environmental Sciences | Senior
Faculty Advisor: Fatiha Benmokhtar, Ph.D.

ABSTRACT: Jefferson Lab is equipped with the Continuous Electron Beam Accelerator Facility (CEBAF). A

10.6 GeV longitudinally spin-polarized electron beam delivered by CEBAF was aimed at a target of unpolarized protons in Hall B. The CLAS12 spectrometer allows the detection of hadrons resulting from the Semi-Inclusive Deep Inelastic Scattering (SIDIS) process and the analysis of this data allows access to the beam single spin asymmetries for different hadron species. The study of single spin asymmetry will allow us to investigate into the proton constituents, understand how quarks and antiquarks are distributed within the proton, and allow for the expansion of human understanding regarding nuclear structure. We focused on analyzing the kinematical and physical variables of the $ep \rightarrow e'p'X$ channel towards the extraction of the azimuthal angular dependency of the beam single spin asymmetry for the detected protons. The data used for the variables is from Fall 2018. Results of this asymmetry are presented against key variables of this reaction using ROOT to produce histograms, 2-D plots, and 3-D plots. The initial results show that the beam spin asymmetry is non-zero for the proton channel, and such a non-zero value will give more information on the makeup of the proton.

67: Memory as a Dynamic Associative System

Gordon Cortney

Music Performance | Mary Pappert School of Music | Sophomore
Faculty Advisor: Matthew Ussia, Ph.D.

ABSTRACT: Memory, like so many other intangible, intellectual concepts attributed to the human experience, is multi-faceted and complex in nature. Previous research by philosophers and scientists alike has shown memory is comprised of contradictory physical and mental elements, thus calling into the question the relative stability of their coexistence. Various works of literature, film and art address the duality of memory prompting the general realization that memory is not fixed but rather is a dynamic associative system that is subject to revision each time a familiar thought or feeling is evoked in the present. A key theme in Christopher Nolan's film, *Memento*, is the facts of the past are permanent but are subject to change through interpretation. The social, political and environmental landscape in which humans interact with is flexible, therefore a particular memory can fluctuate in meaning depending on when, where, and how the memory is recalled. *Worldview*, by Emma Kay, is a work of art documenting the history of the world according to Kay's memory in which blank spaces translate to lapses in memory, effectively indicating the fallibility of human memory. Some argue memory and history are mutually exclusive, but they are one in the same. As Chris Llewyn's *Fragments from the Fire* argues, history is merely memories that have been recorded and shared with the general public. This poster examines memory, emotional and impressionistic, as a foundation upon which human identities are formed and perceived by others.

68: Mercury and Polychlorinated Biphenyls in Commercial Seafood Create Consumer Health Concern

Kamber Kern

Biology | Bayer School of Natural and Environmental Sciences | Senior

Faculty Advisor: Andrew Simpson, Ph.D.

ABSTRACT: The United States has progressively increased their fish and shellfish consumption over the years. Emerging information about its sources of essential nutrients, omega-3 fatty acids, and proteins that contribute to neurocognitive and cardiovascular functions are the primary reason for the increase. However, due to increased plastic pollution in oceans, commercial fish are exposed to 906 hazardous chemicals. After World War II, the production and use of plastics proliferated, producing 100,000s metric tons of plastic to meet consumer needs. The overproduction of plastic leads to aquatic pollution and bioaccumulation of toxins, specifically mercury and polychlorinated biphenyls. These pollutants can negatively impact the cardiovascular, nervous, pulmonary, renal, and reproductive systems in humans, increasing risks of cancer and other disorders. Health risks to consumers have generated the need to address the issue of seafood contamination. Eliminating contamination may be accomplished by creating consumer awareness, regulating seafood products, and conserving the ocean.

69: Perception of Clinical Learning Environment and Self-Reported Caring Behaviors among Undergraduate Nursing Students during the COVID-19 Pandemic: A Cross-Sectional Study

Marissa DeRienzo, Lena Weinstein

Nursing | School of Nursing | Senior

Faculty Advisor: Ergie Inocian, EdD

ABSTRACT: Background: The Bachelor of Science in Nursing (BSN) program has clinical components providing nursing students rich and varied opportunities for practice experience to care for patients across the continuum of care. A substantial body of evidence demonstrates variations in the nature of caring relationship, shaped by environmental context of clinical practice. Thus, this study aimed to investigate the perception of undergraduate nursing students' experience in the clinical learning environment (CLE) and its relationship to their self-reported caring behaviors during the COVID 19 pandemic.

Methods: A quantitative, descriptive, cross-sectional study was conducted among 177 undergraduate nursing students. The Clinical Learning Environment Inventory (CLEI) and the 24-item short form Caring Behavior Inventory (CBI-24) were used. Pearson correlation coefficient was computed to assess the linear relationship between perception of their CLE and self-reported caring behavior.

Results: The overall perception of nursing students on their CLE based obtained a mean score of 3.17 (SD=0.659). The highest mean of 3.57 was recorded in the domain "valuing nurses work" (SD= 0.51), followed by "enabling individual engagement" with a mean of 3.28 (SD= 0.68), "student-centeredness" with a mean of 3.22 (SD=0.64), "affordance and engagement" with a mean of 3.10 (SD= 0.68), and "fostering workplace learning" with a mean of 3.14 (SD=0.64). The domain "innovation and adaptive culture" received the lowest mean of 2.89 (SD= 0.75). In the aspect of their self-reported caring

behaviors, the overall mean score was 5.49 (SD=0.69). The “assurance of human presence” and “respectful difference of others” subscales garnered the highest mean of 5.61 (SD=0.617 and SD=0.644, respectively), followed by “knowledge and skills” with a mean of 5.4 (SD=0.748). The lowest score was “positive connectedness with others” subscale with a mean of 5.25 (SD=0.821). There was no significant correlation between the overall perception of the nursing students on their CLE and their self-reported caring behaviors ($r(175) = .12, p = .128$). However, the “valuing nurses work” subscale in CLE was moderately correlated to the caring behaviors of nursing students ($r(175) = .163, p = .030$), at 0.05 level of significance (2-tailed test).

Conclusion: The nursing students had positive regard towards their CLE and exhibited high level of caring behaviors during the COVID 19 pandemic. Nurse educators may apply innovative interventions that will help improve the CLE, subsequently leading to enhancement of students’ humanistic caring abilities and optimize patient outcomes.

Keywords: Caring behaviors, Clinical learning environment, COVID-19 pandemic, Innovation, Nursing, Student engagement

70: Method Development for the Identification of Five Synthetic Cathinones in Oral Fluid using LC-QQQ-MS

Jacob Katsafanas

Forensic Science and Law | Bayer School of Natural and Environmental Sciences | Senior Faculty Advisor: Stephanie Wetzel, Ph.D.

ABSTRACT: Mimicking the structure and effects of amphetamine, synthetic cathinone (also referred to as ‘bath salts’) have been identified as a rapidly developing subclass of novel psychoactive substances (NPS), aside synthetic cannabinoids and opioids. A substance which falls under the umbrella of NPS refers to those substances which successfully evade regulations due in large to structural modifications. As current trends suggest, there exists the need for streamlined extraction of such substances and beyond due to the growing backlog in forensic laboratories. In doing so, a rapid LC/MS/MS method is under development for analyzing pooled oral fluid samples for 5 cathinone analogues. Separation was achieved using a Luna Omega (Phenomenex) 5 μ m PS C18 100 x 2.1mm column with a Agilent™ 1200 Rapid Resolution High Pressure Liquid Chromatography (HPLC) system. Gradient elution was performed with 0.1% formic acid in water and 0.1% formic acid in acetonitrile. Identification of target analytes was conducted with an Agilent 6460 Triple Quadrupole-Mass Spectrometer (QQQ-MS) operating in multiple reaction monitoring (MRM) mode.

71: Student withdrew.

72: Minimal and Unlivable: the Necessity for an Increase to the Minimum Wage

Julia Filipkowski

Forensic Science and Law | Bayer School of Natural and Environmental Sciences | Freshman Faculty Advisor: Pamela Marshall, Ph.D.

ABSTRACT: The United States has long been viewed as a country of financial opportunity. However,

the recent debate surrounding the minimum wage for U.S. workers has brought attention to instances where employers appear to be lacking in providing adequate wages to their employees. In fact, there is not a single state (nor the District of Columbia) where the minimum wage is equal or greater to the projected “livable” wage for that region. This poster will explore the necessity for an increased wage, as well as some of the potential consequences— both positive and negative. By utilizing articles by Sylvia Allegretto and Micheal Reich, Kelly Reburn, and others, as well as information from organizations like the Bureau of Labor Statistics, this poster analyzes the current state of the workforce in regard to the minimum wage. This poster illustrates the urgent necessity for an increase in the minimum wage to allow for a more realistic livable wage for U.S. citizens.

73: Missense Mutations in a Gene Encoding a Nucleoid-Associated Protein Suppress a Defect in a Cell Division Gene in a Filamentous Bacterium

Daniel Fromuth

Biology | Bayer School of Natural and Environmental Sciences | Senior

Faculty Advisor: Joseph McCormick, Ph.D.

ABSTRACT: *Streptomyces coelicolor* is a Gram-positive, sporulating, filamentous bacterium commonly found in soil. *S. coelicolor* is a well-characterized model organism for prokaryotic development due to its complex and unique life cycle. Aerial hyphae are produced on the colony surface, and these hyphae are evenly divided to become a chain of spores. *ftsQ* encodes a protein that plays an important role in bacterial cell division, including sporulation-associated division in *S. coelicolor*. Previous studies of *S. coelicolor* showed that *ftsQ*-null mutations for *S. coelicolor* are defective in the process of cell division associated with spore formation. Spontaneous suppression mutations have been isolated for an *ftsQ* mutant. Genomic sequencing of three independent mutants with similar phenotypes has indicated that the suppressor mutations may be located in the gene encoding the nucleoid-associated protein (NAP) *Lsr2*. NAPs are crucial for chromosome condensation and organization. The point mutations in *Lsr2* are located in the promoter for one strain and missense mutations in the other two strains. The genes containing these mutations were then cloned, creating plasmids with the isolated region of interest in the genome. Currently, I am in process of recreating “clean” *ftsQ*-null *Lsr2* strains. This will allow me to verify that these mutations in *Lsr2* will suppress loss of sporulation-associated division. The exact reason why altered activity of a NAP will suppress defects in cell division is unclear at this time.

74: Mud in the Water: Using SEM, EDS, and XRD to Analyze Runoff from Horizontal Directional Drilling

Alexandra Supinski

Environmental Science | Bayer School of Natural and Environmental Sciences | Senior

Faculty Advisor: John Stolz, Ph.D.

ABSTRACT: Horizontal Directional Drilling (HDD) is regarded as a more environmentally-sound way for the construction of underground pipelines and cables. The Mariner East is a pipeline that spans from East Ohio and the entirety of Pennsylvania, including West Chester County, Pennsylvania. During

pipeline construction in West Chester County drilling muds were reported to have been found in private water wells and Marsh Creek Lake. Mud samples collected by residents from private water wells, road run off, and Marsh Creek Lake were obtained and analyzed by Scanning Electron Microscope (SEM), Energy Dispersive Spectroscopy (EDS), and X-Ray Diffraction (XRD). The particles ranged in size from 5 to 700 um, and were composed mainly of Al, Si, O, but had other minor constituents (i.e., Fe, Ca, K, Ti) depending on the sample. SEM and EDS detected the presence of aluminosilicate with a signature similar to a bentonite standard. The XRD, however, mainly showed the presence of quartz and albite calcium, the latter known to also be used in drilling mud. The results, although not conclusive due to the complex nature of the samples, do suggest contamination by HDD. The results have been shared with the West Chester community.

75: Nanoemulsions Target Macrophages in Muscular Dystrophy: Potential for Therapeutics

Olivia Price

Biology | Rangos School of Health Sciences, Bayer School of Natural and Environmental Sciences | Junior Faculty Advisor: Matthew Kostek, Ph.D.

ABSTRACT: Duchenne Muscular Dystrophy (DMD) is an X-linked, lethal genetic disorder due to a mutation in the gene dystrophin that causes degradation of skeletal muscles. DMD causes chronic muscle cytotoxic inflammation which leads to muscle necrosis, fibrosis, and great difficulty with mobility. Corticosteroids are the standard treatment but only extend life by a few years and cause long-term severe side-effects. As macrophages drive cytotoxic inflammation, they are an excellent target to manage the disease. This study aims to examine the ability of nanoemulsions to target macrophages in DMD. It is hypothesized that nanoemulsions will target macrophages allowing localization and quantification of macrophages. 16 male D2 mice, 15 male MDX mice, and 8 male C57/bl6 control mice (8 weeks old) were administered drug-free nanoemulsions containing fluorescent dye (DiI/DiR), via tail-vein injections. Muscle samples were collected after 12 days, then preserved, cut, and stained using Hematoxylin and Eosin (H&E) and F4/80 (macrophage) stains for histological analysis. Microscopic analysis was performed to localize macrophages. A preliminary examination demonstrates that the nanoemulsions do directly target macrophages. Our study confirms that these nanoemulsions target macrophages within two muscular dystrophy live animal models and thus are excellent vehicles for anti-inflammatory drug delivery to potentially treat DMD.

76: Optimization of a Homologous Recombination Protocol for Future Insertion of an Antiplasmodial Effector into *Asaia bogorensis* Genome by Utilization of an I-Sce1 Endonuclease

Huong Nguyen

Biology | Bayer School of Natural and Environmental Sciences | Junior Faculty Advisor: David Lampe, Ph.D.

ABSTRACT: Current malaria control strategies such as insecticide use lack long-term effects due to rising resistance within mosquito populations. Another approach, paratransgenesis, attempts to combat malaria by modifying the genome of an existing symbiotic bacteria, *Asaia bogorensis*, within the midgut

of mosquitoes. It has been shown that expression of an antiplasmodial effector inside *Asaia* makes the mosquito resistant to *Plasmodium berghei*, which causes malaria in rodents. However, the antiplasmodial effectors within these strains are maintained on plasmids with antibiotic resistance markers, making them unstable and unfit for long term use. To prepare for stable insertion into *Asaia*, we used homologous recombination to delete a neutral phage site within the *Asaia* genome using modified lengths of homologous regions. However, the protocol for homologous recombination within *Asaia* may be further optimized. To further optimize the protocol, we integrated *I-sce1* into a recombinant plasmid and analyzed relative recombination efficiency.

77: Orca Behavior and the Analysis of Atypical Interactions: Comparison of Behavior Patterns to Multiple Murderer Behavior

Ann DiFrank

Biochemistry / Forensic Science and Law Program | Bayer School of Natural and Environmental Sciences
| Senior

Faculty Advisor: Lisa Ludvico, Ph.D.

ABSTRACT: Are orca whales' advanced hunting behaviors comparable to the victimology and motives of spree and/or serial killers? There has not yet been an animal model proposed for abnormal or pathological human behavior, such as that of multiple murderers. Numerous anecdotal observations have found individual orcas intentionally interacting with water vessels, to the extent of harming themselves. This study predicted, a priori, that these orcas would be juvenile, transient males. Most species outside of humans are known only to display behavior for survival and reproductive efforts. Cultural behavior in orcas has been specially recognized for over thirty years with specific ecotypes defined. Literature on orca behavior and deviant human behavior was systematically gathered for review. A hybrid meta-analysis/ scoping analysis approach has been used for the orca behavior research for the purpose of drawing comparisons to multiple-murderer behavior, including case studies of past serial killers. The idea of cross-species comparisons for modeling abnormal psychological human behavior is a new concept, however, there are specific aspects of orca behavior that can be demonstrative of why multiple murderers act in certain ways, and vice versa. Considering cross-species comparison in forensic psychology and criminology approaches allows for a new perspective to be considered. This work analyzes the issues potentially causing some orcas to unnecessarily interact with vessels, a novel behavior in its frequency and aggressiveness.

Keywords: Forensic psychology, wildlife forensics, *Orcinus orca*, multiple murderers, abnormal psychology

78: Reducing Healthcare Acquired Pressure Injuries in the Operating Room - A Pilot Study

Aidan Shields, Alexis Peters, Alexis Wray

Nursing | School of Nursing | Senior

Faculty Advisor: Yvonne Weideman, DNP, RN

Additional Author: Yvonne Weideman, DNP (Faculty)

ABSTRACT: Healthcare Problem: Healthcare acquired pressure injuries (HAPIs) are a common but

serious complication. HAPIs result in longer hospital stays, greater risk for morbidity and mortality, and increased healthcare costs. HAPI investigation at a community hospital revealed that 53% of all patients with HAPIs had a surgical procedure. In 14% of these patients, the HAPI occurred within five post operative days, indicating that the HAPI developed during the surgical procedure. It was suspected that the existing, unyielding operating surface mattress was the reason leading to a decision to replace the mattresses with pressure redistribution mattresses.

Purpose: The purpose of this pilot study was to determine the impact of replacing the existing standard OR mattress surfaces with pressure redistribution mattresses on OR related HAPIs.

Methods: Post new mattress implementation, records were reviewed on all HAPIs occurring over a three-month period. Data including patient positioning, length of procedure, pressure relieving equipment, location of HAPI, was recorded for HAPIs occurring within five days post-surgery. Descriptive statistical analysis was performed to compare pre and post HAPI rates.

Findings: A 1% decrease in the incidence of OR acquired HAPIs was noted along with a 0.31% decrease in OR HAPIs per patient.

Conclusion: Initial results indicate that pressure redistribution mattresses may decrease OR related HAPIs. These results will be utilized to guide additional research and practice at the facility to decrease HAPIs, thereby ultimately improving patient outcomes, decreasing length of stays as well as patient morbidity and mortality due to surgically related pressure injuries.

79: Periplasmic Extraction of RarA, a Membrane Porin from *Sulfurospirillum barnesii* SES-3

Lauren Rebel

Biology | Bayer School of Natural and Environmental Sciences | Senior

Faculty Advisor: John Stolz, Ph.D.

Additional Author: Narthana Jeganathar Kanmanii (Graduate Student)

ABSTRACT: While arsenic contamination of soil and groundwater is toxic to human populations, arsenate can be used as an energy source for certain anaerobic microorganisms. Among these is *Sulfurospirillum barnesii* SES-3, a bacterium capable of reducing a variety of metals and metalloids. The reductase capabilities of SES-3 are a result of its unique membrane protein, RarA. Based on computational modeling, we hypothesize that RarA is a monomeric, 18-strand antiparallel β -barrel porin. Upon its successful extraction and purification, RarA could be valuable in the bioremediation of contaminated water. This project aimed to explore periplasmic extraction as a method for extracting the native protein from SES-3 whole cells. Fractions obtained were further purified using anion exchange chromatography and analyzed by western blotting. Activity assays were performed in the presence of various oxyanion substrates to determine specific activity. Furthering our understanding of the kinetics of RarA will assist in the development of bioremediation strategies.

80: Personalizing Face Mask Frames for Improved Fit and Protection

Lucia Secaida Del Cid, Adam Lewis

Biomedical Engineering | Rangos School of Health Sciences | Junior

Faculty Advisor: Bin Yang, Ph.D.

ABSTRACT: Throughout the COVID-19 pandemic, face masks have been used to reduce the spread of the virus via airborne particles and droplets. As certain masks such as KN95 or N95's have been proven to be most effective, the general public has more access to basic cloth masks. The effectiveness of these masks depends upon the fit and can be increased by adding a face mask frame to decrease the amount of particles and droplets escaping. The goal of this project is to generate a personalized frame which improves the protective power of a regular surgical face mask as it allows for improved filtering.

Methods:

We used a true depth camera of an iPad Pro to obtain a 3-D scan of our faces, and generic designs of flat face mask frames to be deformed. By using different computer-aided design (CAD) software and different deformation methods we were able to design a personalized frame that was adapted to the scanned face. Designs were 3-D printed to test the fitting quality; the models and prints were used for analyzing differences and optimizing our design process.

Conclusion:

The generic design of the face mask frame and the CAD software used directly affect the result of the personalized frame. We observed that using a more complex initial design would result in a less smooth personalized frame which needed more post processing. We also observed that different software yielded different results as some methods needed less post processing, making the personalized frame smoother and better fitting.

81: Physical Therapy and the Opioid Crisis

Melanie Schultz

Physical Therapy | Rangos School of Health Sciences | Sophomore

Faculty Advisor: Rebecca Maatta, Ph.D.

ABSTRACT: The 1990s started an era of prescribing patient's opioids for chronic, non-cancer, pain management. Over the last 30 years this started a chain reaction to what is now called "The Opioid Crisis". As more people became addicted to these highly addictive drugs the rate of overdoses skyrocketed. Attention has now shifted to finding alternate nonpharmacological ways of managing pain in order to reduce opioid usage by patients in an effort to directly combat the opioid crisis. This poster will review recent research on physical therapy's potential to reduce dependence on opioid-based medications for pain management in different demographics. By using research and journal articles on specific studies of physical therapy being used rather than opioids, studies of physical therapy treatment coupled with opioid use, and recent statistics about the opioid crisis, this poster examines how physical therapy combats pain through natural movements of the body using exercises which allows for tolerance of movements and transition the patient from pain back to a normal functioning life without the use of medication. This poster shows that physical therapy is an alternate, safe, and yet underused, method of combating pain with potential to reduce the use of opioid-based medications for pain.

82: qPCR confirmation of RsmE-regulated genes in Pseudomonas fluorescens

Amber DelPrince

Spanish | Bayer School of Natural and Environmental Sciences | Senior

Faculty Advisor: Wook Kim, Ph.D.

Additional Author: Anton Evans (Graduate Student), Wook Kim, Ph.D. (Faculty)

ABSTRACT: *Pseudomonas fluorescens* has three paralogs – RsmA, RsmE, and RsmI – belonging to a super family of proteins that function as a post-transcription repressor of diverse secondary metabolites. We have found that a spectrum of loss-of-function mutations in RsmE spontaneously arise in aging *P. fluorescens* colonies, which manifest overproduction of extracellular secretions to ultimately produce spatially localized mucoid patches within the colonies. The mucoid phenotype dramatically increases the fitness of RsmE mutants compared to the wildtype cells. Since mutations occur exclusively in RsmE to drive this phenotypic change, we hypothesize that RsmE possesses unique functions from its paralogs. Our goals are to identify the genes that are specifically regulated by RsmE to produce the mucoid phenotype and to understand how the mutations in RsmE confer fitness advantage over the wildtype. We thus conducted RNAseq to compare the global gene expression profiles between the rsmE mutant and wildtype. The Kbase database was then used to analyze the expression profiles, which led to the identification of five top candidate genes that likely contribute to the mucoid phenotype of rsmE mutants. In addition, we have designed primers for these five specific genes and are currently optimizing the methods for qPCR analysis. Conducting qPCR is necessary to confirm our RNAseq expression profiles, and the optimization efforts will be valuable for the confirmation of additional RsmE-regulated genes, and genes that are uniquely regulated among the three paralogs.

83: Project MADMEN: Adapting the ALIEN Martian Mission Framework for Terrestrial Based Validation

Benjamin Kazimer

Biomedical Engineering/Physics | Rangos School of Health Sciences, Bayer School of Natural and Environmental Sciences, School of Nursing, Biomedical Engineering | Senior

Faculty Advisor: Melikhan Tanyeri, Ph.D.

Additional Author: Madelyn Hoying (graduate student @ MIT/Harvard), Alexander Evans (graduate student @ University of Rochester), Burton Carbin IV (biomedical engineering), Karli Sutton (graduate student @ University of Rochester), Rebecca McCallin, Garret Craig (graduate

ABSTRACT: Project ALIEN (Alternative Lifeform Identification and Exploration Navigator) is a comprehensive mission architecture for human exploration of the Martian surface with the goal of searching for evidence of life on Mars. This proposed Martian exploration mission has been restructured for feasibility testing in a Mars mission analogue facility on Earth. The adapted mission is referred to as Project MADMEN (Martian Analysis and Detection of Microbial ENVironemnts), and this paper outlines the changes made to the mission architecture to accommodate an Earth-based mission, and the impact of these changes to the outcome of the analogue. Specifically, we investigate how closely the analogue simulates the conditions expected in a Martian surface mission. Extravehicular activity (EVA) procedures developed for the analogue to emulate the search for life in Gale Crater will be used to demonstrate the feasibility of Project ALIEN's approach to microbe discovery. Additionally, EVA planning contingencies will be devised to account for inclement weather conditions expected in the analogue. Overall, Project MADMEN allows for feasibility testing of experimental procedures and helps develop systems to enable a full-scale exploration of the Martian surface through Project ALIEN.

***84: Quantifying the Presence of Insulin Overbasalization in a Family Medicine Practice**

Rebekah Meyers

Pharmacy | School of Pharmacy | Senior

Faculty Advisor: Autumn Stewart-Lynch, PharmD, BCACP, BC-ADM

ABSTRACT: Objectives: Although basal insulin is effective in the treatment of Type 2 Diabetes Mellitus (T2DM), insulin overbasalization may prevent patients from attaining hemoglobin A1c targets and increase the risk of high glucose variability, weight gain and hypoglycemia. Overbasalization may be suspected in patients with basal insulin doses ≥ 0.5 IU/kg/day, postprandial glucose ≥ 180 mg/dL, bedtime to AM (BeAM) glucose differentials ≥ 50 mg/dL, and/or A1c not at goal despite reaching fasting glucose targets. This study is intended to quantify the frequency of overbasalization in a family medicine practice.

Methods: This retrospective, observational study included adult patients with a diagnosis of T2DM prescribed any basal insulin product between June 1, 2018 and June 30, 2021 at a family medicine practice located in southwestern Pennsylvania. Data were analyzed using descriptive statistics and Chi-squared test comparing A1c goal attainment and weight gain with presence of overbasalization.

Results: A total of 105 patients met the study's inclusion and exclusion criteria. Overbasalization (≥ 0.5 units/kg/day) was

identified in 17 (16%) patients. The average most recent A1c was 8.8%. The mean A1c among patients taking ≥ 0.5 units/kg/day was 9.4%.

Conclusions: The prevalence of overbasalization was lower than expected from a previous report in the literature of 40%. Lack of glycemic control and higher than average A1c among overbasalized patients supports current literature identifying overbasalization as a barrier to achieving glycemic control in T2DM. This literature may be used as a method to overcome clinical inertia in the future.

85: Rapid Quantification of Bacteria Using Droplet Microfluidics

Matthew Nestler

Biomedical Engineering | Rangos School of Health Sciences, Biomedical Engineering | Senior

Faculty Advisor: Melikhan Tanyeri, Ph.D.

ABSTRACT: Bacteria enumeration is a technique used in many applications including clinical, environmental, and food testing. However, the current standard for bacteria quantification, agar plating, is labor intensive and can take up to several weeks to complete. For many applications, this long timespan produces a bottleneck for increasing throughput and reducing cost. Therefore, alternative techniques are required for rapid detection and quantification of bacteria. Here, we describe a new method based on droplet microfluidics and machine learning to rapidly quantify bacteria in liquid samples. Our method relies on encapsulating and culturing single bacterial cells in droplets, and imaging them subsequent to an incubation period. Finally, we analyze these images using machine learning algorithms for fast and accurate quantification of bacteria in the sample. Our method holds potential for

reducing cost and time for applications requiring accurate quantification of bacteria using small sample volumes.

86: Reevaluating the causes of Destruction of the Lower Hill

Avishek Acharya

History / Political Science | McAnulty College and Graduate School of Liberal Arts | Senior

Faculty Advisor: Jennifer Tayler, Ph.D

ABSTRACT: Duquesne sits just some 2 blocks away from a neighborhood of historical notational importance. Those two blocks might be the longest distance known to man, a contortion of time and space that makes no students resigned to never visit “The Hill”. The Hill is a neighborhood of national importance, jazz legends, national-level newspapers, and artists are and were from the Hill. A storied history to boot. However, the Hill of today is much smaller than it has ever been, the destruction of the Lower Hill effectively separated the neighborhood’s access to down and up towns. The destruction of the Hill can be chalked up to a larger trend of “urban renewal”, a series of misguided attempts to undo the effect of white flight. However, locally when combing through the historical archives a story of the Hill as a doomed neighborhood forced to relocate emerges. An attempt by politicians to create an urban space for suburbanites, rather than a space for those who lived there, a media culture unwilling to question the ideology of ‘urban renewal, and a neighborhood fighting a losing tide against a political elite begins to emerge. I got this picture by searching the historical archives of the Pittsburgh Courier and the Pittsburgh Post-Gazette as well as secondary sources by local historians. During this project, I learned about the history of the Hill as well as the factors leading up to its destruction. The lower Hill is once again changing ownership, the topic of the story of its destruction is important to advocate for the future of the area today.

87: Regulation of Vascular Endothelial Growth Factor (VEGF) by a Network of Binding Interactions: A Computational Model

Ian Ferris

BME/BSN | Rangos School of Health Sciences/School of Nursing |

Faculty Advisor: Kimberly Forsten Williams, Ph.D.

ABSTRACT: A key step in cell growth is mammalian cell signal transduction which is often initiated by the binding of growth factors to specific cell transmembrane receptors. The vascular endothelial growth factor (VEGF) family is one of these important growth factors that plays an important role in the development of new blood vessels through the process known as angiogenesis. VEGF-A is the model molecule of the family where cell signaling mechanism occurs primarily through the transmembrane VEGF-2 receptor. While angiogenesis plays an important role in wound healing and in emerging areas like tissue engineering, its role in cancer physiology is less desirable. One way to reduce the angiogenic signaling is by preventing receptor interaction with VEGF using pharmaceuticals like Bevacizumab (Avastin) and heparin. The primary issue is that the cell local environment is not simple and consists of many potential binding partners, not all of which accomplish the task in mind. This project is focused on constructing MATLAB-based models to assist in understanding the dynamics of VEGF regulation by the local environment including VEGF receptor 2, extracellular matrix binding sites within fibronectin,

heparin and the pharmaceutical Bevacizumab (Avastin). This presentation will focus on the structure of the network system as well as present how varying the components impacts the dynamics. In particular, we focus on the differences found under physiological and hypoxic conditions, characteristic of tumors, via parameter changes. The model constructed is general to any growth factor system with specific parameters tailoring it to the VEGF family.

88: Revisiting the CSI Effect: Has the popularity of crime media changed anything?

Elizabeth Diltz

Forensic Science and Law | Bayer School of Natural and Environmental Sciences | Senior
Faculty Advisor: Lyndsie Ferrara, Ph.D.

ABSTRACT: CSI: Crime Scene Investigation, NCIS, Forensic Files, 48 Hours, these are all television programs with a focus on the forensics of crime investigation. While two of these shows (Forensic Files and 48 Hours) focus on real crime stories, CSI and NCIS are dramatizations of the world of forensic investigations that have led to the idea of a phenomenon known as the “CSI Effect.” This phenomenon is commonly defined as jurors being influenced by shows like CSI and the portrayal of forensics, and this leading to more acquittals when evidence is lacking. While most of the previous research done into the CSI Effect has shown that there is no support for this idea, there has been little research into the idea of sub-genre of crime media having different influences on juror’s evidence expectations. Using survey software to compare the hours spent watching crime media of both sub genres, evidence expectations of participants, and verdicts in crime scenarios, it was hypothesized that there would be no significant difference between those that watch more true crime media over those that watch crime dramas in verdict decision making. The results of this research will help determine if there is no impact from outside crime media when jurors are making their verdicts.

***89: Role of DNA Topoisomerase 1 in Herpes Simplex Virus Type-1 Infection**

Raegen Esenwein

Biology | Bayer School of Natural and Environmental Sciences | Junior
Faculty Advisor: Jill Dembowski, Ph.D.

ABSTRACT: Herpes simplex virus type 1 (HSV-1) infects nearly 70% of the human population. In addition to producing its own viral factors, HSV-1 utilizes numerous host proteins to facilitate its infection cycle. One host protein of interest, found to interact with the HSV-1 genome throughout replication, is human topoisomerase 1 (Top1). In human cells, Top1 is an enzyme required for normal growth and development. Top1 ensures proper transcription and DNA replication by creating transient, single stranded nicks in DNA to relieve topological stress and allow for relaxation of supercoiled DNA. Based on its role in cellular processes, we believe that Top1 aids in the regulation of HSV-1 viral transcription and/or replication. We hypothesize that altering Top1 expression in HSV-1 infected cells will decrease viral yield by not permitting an efficient infection cycle to occur. To alter Top1 expression, the commercial inhibitor, camptothecin (CPT) was used. CPT functions to block religation of DNA by Top1, preventing relaxation of supercoiled DNA. Our studies revealed the novel observation that Top1 inhibition via CPT does reduce viral yield. An inducible Top1 shRNA knockdown cell line has been created as another method of alteration. Top1 targeting shRNA cell lines stop translation of Top1 mRNA

reducing the amount of Top1 protein present in cells. We are currently characterizing the effects of Top1 knockdown on HSV-1 infection. In the future, we will determine if viral transcription or DNA replication are altered after Top1 inhibition or knockdown. These studies will further pinpoint the role of Top1 in HSV-1 infection.

90: Simultaneous multi-particle trapping using multiple coupled stagnation flows

Gram Hepner and Maxwell Ujhazy

Biomedical Engineering | Biomedical Engineering | Sophomore

Faculty Advisor: Melikhan Tanyeri, Ph.D.

ABSTRACT: Since the 1950s, microdevice-related research has rapidly grown. Microdevices such as microfluidic chips, or organs-on-chips utilize new microfabrication techniques that allow both greater efficiency and better manipulation of nature with microscale components, in comparison to large-scale lab techniques.

This poster will demonstrate the feasibility of trapping and manipulating various molecules in solution using a confinement method that utilizes coupled stagnation flows. Compared to other particle trapping methods, hydrodynamic trapping is not dependent on acoustic, electrokinetic, magnetic, or optical fields. This microfluidic trapping method provides a new platform for macromolecule and nanoparticle observation without immobilizing the surface, allowing both particle and solvent to be more diverse in properties. This introduces the opportunity to manipulate the medium by using various solutions while analyzing the trapped particle freely and expands research horizons in this field.

This technique is facilitated on a PDMS- based hydrodynamic trap that uses planar extensional flow to create a stagnation point that is only affected by Brownian motion, which is combatted through active feedback control that uses position calculations and adjusted flow rate through channel manipulation. This allows for the trapping of particles as small as 10 nm, which an average displacement of 100nm.

***91: Social Conformity in Virtual Meetings**

Mackenzie Farbo, Seth Stoll

Psychology | McNulty College and Graduate School of Liberal Arts | Junior

Faculty Advisor: Alexander Kranjec, Ph.D

Other Author: Jonathan Rowe (Clinical Psychology - Grad Student)

ABSTRACT: During the COVID-19 pandemic many student lectures and meetings have been held online. A notable feature of online meeting software (like Zoom) permits a user the choice of whether to show or hide their face. In part because teaching is difficult when students choose to turn their cameras off, understanding the dynamics of this behavior has become a topic of interest for educators. The current study examines the effects of conformity on camera behavior on Zoom. To investigate, we performed interviews over Zoom under the pretense of doing research about current dining options on campus. Participants were asked to prepare some informal answers for the interview in advance. On the day of their interview, participants joined a Zoom meeting where three confederates posing as other student participants and the researcher running the study were also present. The confederate responses

consisted of pre-recorded videos and sound clips that had the appearance of being live. There were four conditions. In condition ALL ON, all 3 confederate faces were visible; in condition MOST ON, 2 faces were visible; in condition MOST OFF, 1 face was visible; and in condition ALL OFF, no faces were visible. The experimenter's camera was always on and provided live feedback. We were interested in how participants conformed to majority camera use. We recorded the camera decision behavior for each participant. Results indicate that subjects conformed to the majority 82.5% of the time. Data from a short questionnaire found that personality differences in introversion or extraversion had no effect on camera use. These findings show that conformity plays a significant role in determining student decisions and suggests policies that may encourage participation.

92: Software Development for the CLAS12 Ring Imaging Cherenkov Detector

Aiden Boyer

Physics | Bayer School of Natural and Environmental Sciences | Senior

Faculty Advisor: Fatiha Benmokhtar, Ph.D.

ABSTRACT: Hall B of Jefferson Lab utilizes a Large Acceptance Spectrometer (CLAS12) to study electro-induced nuclear and hadronic reactions. This spectrometer is itself composed of several detectors that identify collision products at certain angles, energy, and momenta. One of these detectors is the Ring Imaging Cherenkov Detector (RICH), which allows for the separation of pions, kaons, and protons in the 3-8 GeV/C momentum range at entrance angles less than 25 degrees. The RICH, alongside other detectors in CLAS12, has its own monitoring software to control the detector performance. My project aimed to improve the RICH monitoring and graphic representation of its statistical information. During an inspection of the monitoring software, it was found that some of the information coming from the front-end electronics was not accurately decoded. These issues were addressed in a new version of the RICH software. Program analysis techniques were employed to achieve this, which involved navigating line-by-line through the RICH monitor code and cross referencing the intended actions of the program with the physical construction of the detector. With events being analyzed by the incorrect algorithm, the overall picture of the RICH hits was obscured. The corrections made to the monitor mapping now allows for a more accurate readout of event data and can help streamline the process of adding new RICH detectors to the CLAS12 software in the future. In addition, the preliminary development of the second RICH modules electronics layout will be discussed.

93: Spatial Analysis of Roman Amphitheaters: Sensational Staging in Seneca's Medea

Adrian Kessler

Music Education | Mary Pappert School of Music | Junior

Faculty Advisor: Nicole Vilknor, Ph.D.

ABSTRACT: Roman amphitheaters, derived from "amphi" meaning "on both sides," are open, circular structures with a central space for viewing both theatrical and sports-related entertainment. The tiered seating of the amphitheaters offered the audience an uninhibited, 360-degree view of events, unlike other semi-circular Roman theatres. We have limited knowledge as to what the theatrical experience was like having only literary works and archaeological evidence to provide clarity. The 230 surviving Roman amphitheaters provide a glimpse into theatrical life during that time. Looking at the

architectural features of amphitheaters, I analyze structural details that might help us better understand staging choices in Roman theatre. One of the most interesting features of the amphitheater was the vomitorium, a passageway behind the tiered seating where audience members and performers entered and exited the performance space. Structural features like this blurred lines between the audience and performer. Examining scenes from Seneca’s adaptation of Medea (originally written by Euripides), I consider how Seneca altered the Greek drama to fit the Roman amphitheater, particularly by incorporating more sensational stage violence. Looking at these examples, I argue that the Roman amphitheater is designed to blur the lines between the audience and the performers, creating an immersive and sensational experience for audiences.

94: Speech in the Spotlight: Integrating Music, Movement, and Speech Production

Brooke Yurick

Speech-Language Pathology | Rangos School of Health Sciences | Senior
Faculty Advisor: Heather Rusiewicz, Ph.D., CCC-SLP

ABSTRACT: The use of music and hand gestures are often integrated into activities that support speech production for children developing speech and for individuals with speech sound disorders. There is a growing body of research to support the use of both music and gesture for these purposes. In recent years, there has been an increased need to access educational materials via digital platforms. However, there are limited available web-based video resources for families, SLPs, and educators with a focus on speech development. A novel program, “Speech in the Spotlight”, was initiated to bridge the importance of music and movement in the broader community accessing video-based resources to support speech development. “Speech in the Spotlight” is comprised of brief videos that were produced and will be disseminated on a social media platform. Each of these videos provide instruction on either an individual speech sound or broader concept about the vocal mechanism. These videos incorporate original song-writing, gestures that mirror the spatiotemporal properties of speech (i.e., manual mimicry gestures), and engaging repetition of targets. Connections to principles of community engagement in a digital space, the impact of music and gesture on learning, and the utility of web-based resources on social media platforms will be presented. Additional research avenues and broader implications of research incorporating music and movement into speech therapy will be discussed.

95: Source Attribution for Lighter Fluids from Fire Debris

Ashton Marini

Biology | Bayer School of Natural and Environmental Sciences | Senior
Faculty Advisor: Stephanie Wetzel, Ph.D.

ABSTRACT: Arson is a criminal act that can destroy millions of dollars in any type of property or even human life. With this in mind, little progress has been made in regard to methods of evidence examination and determining what type of accelerant was used. Lighter fluid is a common type of accelerant found at arson scenes that can be purchased at many local retail stores. It is imperative to determine if the variety of brands available to consumers can be individualized which will reduce the risk of wrongful convictions. A charcoal extraction method and gas chromatography-mass spectrometry (GC-

MS) analysis were used to compare five different brands of lighter fluid after burning on three different source materials to determine if they can be classified as statistically different. The source materials in question consist of a 100% cotton t-shirt, wood, and carpet. These were chosen because they are often found in arson scenes. It is expected that each of the brands of lighter fluid will be able to be distinguished, although brands that are owned by the same company may not be found to be statistically different. Forensic investigators can determine what brand of lighter fluid was used to burn the property, and potentially find the person who bought the accelerant for further questioning.

96: Teaching How to Use a Food Tracking App and Evaluating the Impact of Lifestyle Coaches in a Diabetes Prevention Program: A Quality Improvement Project

Sara Greenan Isabella DeFabbo (Nursing)

Rachel Pappalardo (Nursing)

Nursing | School of Nursing | Senior

Faculty Advisor: Melanie Turk, Ph.D.

ABSTRACT:

Background/Purpose:

The Diabetes Prevention Program (DPP) can help at-risk individuals prevent type 2 diabetes through 5-7% weight loss via healthier eating and increasing physical activity. Duquesne University began a DPP for the Clairton and Hazelwood communities using Zoom®. The purpose of our quality improvement project was: 1) to deliver a presentation on using the weight loss app 'Lose It!' for tracking food intake and 2) to evaluate if having one lifestyle coach versus five coaches impacts participants' attendance, weight loss, and activity minutes.

Methods:

From September 2021 to February 2022, participants joined the 11:00 am class with 5 different coaches or the 5:00 pm class with 1 coach. We presented a tutorial on using Lose It! to track food intake. We administered a Qualtrics® survey to assess clarity of the presentation and suggestions for improvement. We examined weight loss, weekly attendance, and physical activity minutes after 16 weeks.

Results:

The Lose It! app sparked interest in food tracking, but not being able to provide hands-on assistance in-person was a barrier. Only ~50% (n=5) used the app. Weight loss, attendance, and activity between the 11 am and 5 pm groups were similar (4.2% weight loss, 6.7 persons attended, 162.9 weekly activity minutes vs. 3.5% weight loss, 6.5 persons attended, 174.9 weekly activity minutes, on average, respectively).

Conclusion:

Delivering a presentation on a food tracking app via Zoom® is feasible, but assisting with technological challenges was difficult. We found no issues with multiple lifestyle coaches delivering the DPP compared to just one.

97: The DNA Analysis of the Human Tissue Leaching from Different Soil Depths

Jenna Hamilton

Forensic Science and Law | Bayer School of Natural and Environmental Sciences | Senior
Faculty Advisor: Pamela Marshall, Ph.D.

ABSTRACT: When investigating a victim's death, a forensic pathologist needs to determine the time frame. This postmortem interval or PMI could be determined if the pathologist can determine how much a person's DNA leaches into the soil at different depths. Given that the overall knowledge of determining the time of death is limited, especially through different depths of soil, analyzing the amount of DNA leached into the soil over time may help determine the rate of leaching per depth, over time and weather. In this study, human tissue was obtained from a forearm belonging to a 55-year-old man that was freeze-thawed once. The amount of DNA leached into the surrounding soil will be analyzed by burying the tissue samples at 4 feet, 2 feet, and 1-foot, using loam soil and a grow pot. The DNA will be extracted using the DNeasy Power Soil Pro-Kit and run through cell electrophoresis, qPCR, and PCR. The soil microbe will also be analyzed using the Model EM Soil Test Kit.

98: The Effect of Sleep on Infant Focused Attention

Melanie Tommer

Physical Therapy | Rangos School of Health Sciences | Sophomore
Faculty Advisor: Regina Harbourne, Ph.D.

Additional Authors: Amber DelPrince, Karl Jancart (Graduate student; School of Psychology)

ABSTRACT: Background:

Sleep is known to support cognition and memory but the relationship between sleep and one aspect of cognition, attention, is under-studied in infants. Focused attention, the ability to maintain complete focus on a task/object, has been shown to be related to learning and cognitive development.

Purpose:

The purpose of this study was to understand the effect of sleep on focused attention in young infants (5-8 months old) who could sit independently.

Methods:

Twenty-nine infants, corrected ages 144-266 days were scored via the Global Focused Attention (GFA) scale (1=low-5=high) during free play in independent sitting with 3 toys for 90 seconds per toy, and then averaging over the 3 toys. A Nanit sleep monitor recorded infants' total sleep time the night before data collection.

Results:

Overall, there was a weak and non-significant correlation between total sleep time and the average GFA score. However, because the age range of the infants was wide, we divided the infants into 4 groups: older & more sleep, older & less sleep, younger & more sleep, and younger & less sleep. The infants that were older and had more sleep had significantly higher GFA scores than infants in the other groups ($p=.05$). Thus, infants who were both older and had better night sleep had higher focused attention scores on the following day.

Conclusion:

We continue to study the relationship between sleep, age, and focused attention. Our result confirms an interaction between increasing age and sleep, leading to better understanding of how sleep can improve attention and early learning in infants.

99: The Effectiveness of Video Prompting vs. Picture Prompting for Improving Daily Living Skills of Children with Autism Spectrum Disorder (ASD)

Alivia Cartwright

Occupational Therapy | Rangos School of Health Sciences | Senior

Faculty Advisor: Jeryl Benson, EdD, OTR/L

ABSTRACT: The use of technology is becoming mainstream in everyday education including for young children. Children with Autism Spectrum Disorder (ASD) may need assistance with activities of daily living (ADLs) and other areas of occupation. Interventions for children with ASD may include assistive technology or other devices. Currently, the use of static picture (SP) schedules is used to orient the child to the steps of activity to promote independence. As technology progresses the addition of assistive devices, such as a tablet, have made use of videos accessible. Video modeling (VM) can be used to introduce a child to a task and may be beneficial for children with ASD. The child watches a video of the task and uses the video as a cue for task participation and completion. Video modeling has been studied on its own but there is a need for further research to support the use with children with ASD. This study aims to determine the effectiveness of video modeling (VM) prompting vs the prompting provided by a static picture. An experimental alternating treatment design (ATD) was used to examine the effects of VM prompts and SP prompts on skill acquisition for each participant. Data findings will be shared in the presentation of the study.

100: The Effects of Temperature and Precipitation on the Amount of Recoverable Human DNA From Soil During Decomposition

Wesley Wagner

Forensic Science and Law | Bayer School of Natural and Environmental Sciences | Senior

Faculty Advisor: Pamela Marshall, Ph.D.

ABSTRACT: Human decomposition is a field that has been greatly studied, with multiple projects having focused on any number of variables, including, but not limited to, temperature, soil pH, soil type, insect activity, medical conditions of deceased, soil moisture, weather patterns, scavenging activity, and many others. However, much of this research focused on the rates of decomposition. Rather than focusing on the decomposing remains, this research expands its interest to the soil surrounding the

remains, specifically, the potential recoverable DNA. This research examined the relationship between the two most influential factors on the rate of decomposition, temperature and soil moisture, and their potential relationship with the amount of recoverable DNA from soil during the decomposition process. This was done by burying eighteen human tissue samples of equal sizes into separate pots and allowing decomposition to occur outdoors. At periods of 1, 3, 5, 7, 9, and 12 months, three pots were removed and the soil directly above, around, and below the tissue samples was collected. The DNA was then extracted from the soil and quantified using quantitative polymerase chain reaction (qPCR). The extracted DNA was also genotyped using capillary electrophoresis (CE). It is predicted that an increase in soil moisture will be correlated with an increase in the DNA concentration, while a decrease in temperature will be correlated with a decrease in concentration.

101: The Extraction and Identification of Illicit Compounds from Baked Goods Using Paper Spray Ionization – Tandem Mass Spectrometry (PSI-MS)

Isabella Haberstock

Biochemistry | Bayer School of Natural and Environmental Sciences | Senior
Faculty Advisor: Michael Van Stipdonk, Ph.D.

ABSTRACT: Complex matrices like cookies and other baked goods have become common methods of consumption for illicit substances like MDMA, methamphetamine, and amphetamine, but there is a gap in the field of rapid drug detection in spiked edibles. The existing research for extracting substances from edibles has been exclusively for cannabis, and the developed extraction methods for this application are very complex and can require multiple extractions to obtain a prepared sample for detection. To fill this gap in the literature, the goal of this project is to couple the QuEChERS (Quick Easy Cheap Effective Rugged Safe) dispersive solid phase extraction method with paper spray ionization – tandem mass spectrometry (PSI-MS) to create an optimized and rapid extraction and detection method for illicit substances in edibles. To accomplish this, cookie dough will be spiked with varying amounts of phenethylamine, which is a structural precursor to the stimulants mentioned above. The cookies will be baked and extracted using the QuEChERS method. The resulting supernatant will be analyzed using the Thermo Scientific LTQ-XL Linear Ion Trap Mass Spectrometer for the presence of the phenethylamine peak, which will be confirmed through the use of tandem mass spectrometry (MS/MS) and collision induced dissociation (CID). This research will advance drug chemistry studies of edibles using more rapid and accessible methods so that QuEChERS and PSI-MS can be implemented in more laboratories.

102: The Glorification of Abusive Behavior in YA Literature: An Analytical Review of the Twilight Saga

Ellie Quinlan

Secondary English Education | School of Education | Sophomore
Faculty Advisor: Emad Mirmotahari, Ph.D

ABSTRACT: Young adult fiction literature has been a vehicle for various entertaining, fantastical stories, with an audience made up primarily of adolescents between the ages of 12-18. One of the most popular novel series that has taken the world of YA fiction by storm internationally is the Twilight Saga. Audiences around the world have praised author Stephanie Meyer for her creation of a fantastic

romance story, and young readers have idolized the fictional couple's relationship. The primary plot drive throughout the story involves a vampire, Edward Cullen, and his constant restraint from killing the protagonist, Bella, and drinking her blood. He restricts himself due to his perceived love and romantic interest in her. This poster will explore specific instances of abusive behavior that take place in the Twilight Saga, and how Meyer writes it under the context of an ideal romantic relationship, as well as the effects this may have on young readers.

103: The Hero's Journey (Joseph Campbell): Choral Music Edition.

Danna Villarey

Biology | Bayer School of Natural and Environmental Sciences | Freshman

Faculty Advisor: Gregory Jones, Ph.D.

ABSTRACT: Joseph Campbell's *The Hero's Journey* talks about embarking on an inner journey of transformation, leading to one's enlightenment, hence becoming a true hero. It follows a series of stages that the "hero" would go through before becoming enlightened, a concept often evident in fairy tales and movies. While *The Hero's Journey* can often play a role in fairy tales and movie analyses, it can also play a role in musical analysis. This poster interprets a choral music piece called *Peace Flows Into Me* by Michael John Trotta through the context of Joseph Campbell's *The Hero's Journey*. By using the lyrics and musical dynamics of the choral music piece, this poster will show that a musical composition — such as *Peace Flows Into Me* — could also be admired and interpreted not just as an emotional and dynamic piece but as a journey, conveying a story of how the persona of the song achieves peace within after going through the stages of becoming a hero.

104: The Identification of Gammarid Amphipod Species by Scanning Electron Microscopy and DNA Barcoding

Mikayla Bayto

Environmental Science | Bayer School of Natural and Environmental Sciences | Junior

Faculty Advisor: John Stolz, Ph.D.

ABSTRACT: Amphipods — also known as scuds or freshwater shrimp — are bottom-dwelling members of subphylum Crustacea. Scuds exhibit collector-gather feeding behavior and are moderately tolerant to pollution. The identification of amphipod species is difficult due to small specimen size, little morphological variance, and lack of study at the species level. We were interested in examining the morphological diversity of Gammarid amphipod specimens from the Mingo Creek watershed of Washington County, PA. Specimens from the Gammaridae family — *Gammarus* and *Crangonyx* genera, specifically — were analyzed by scanning electron microscope (SEM), dissection microscope, and DNA barcoding. The SEM allowed for enhanced viewing of setae and comb spines not as easily viewed with a dissecting microscope. Dissection microscopy and DNA barcoding were utilized to support the scud species identifications determined from SEM imaging as well as existing Gammarid literature. SEM analysis of Gammarid specimens proved helpful in determining Gammaridae specimen genera and species.

105: The Impact of Earthworm Activity on the Movement of Human DNA into Soil

Lauren Dangel

Forensic Science and Law/Biology | Bayer School of Natural and Environmental Sciences | Senior
Faculty Advisor: Lisa Ludvico, Ph.D.

ABSTRACT: After death, the human body decomposes and releases cellular contents into its surroundings. DNA has been shown to be influenced and ingested by other living things such as insects in the environment. Despite the advances in extracting and developing DNA profiles from insects, there has been no research on earthworms, an annelid that lives in soil and decomposes organic matter. The purpose of this study is to determine the impact of the activity of the earthworm species *Lumbricus terrestris* on the movement of human DNA into a soil burial environment as human tissue undergoes decomposition. Donated cadaveric flesh will be placed into a loamy soil environment containing earthworms and allowed to decompose for six months outdoors. Samples of soil and earthworms will be collected throughout the study period. The Qiagen DNAeasy[®] Powersoil Pro and Blood and Tissue Kits will be used to extract any DNA contained within the soil and earthworm matrices. The quality and quantity of the extracted DNA will then be assessed using quantitative PCR. Samples of high enough quality and quantity will be genotyped and compared to the profile of the flesh. It is anticipated that the presence of earthworms will impact the rate of DNA transfer into the soil. Through the earthworm's interactions with the soil environment, it is predicted that they will retain and redistribute the DNA by passing it through their digestive tract. By understanding this interaction, this research can later be useful in identifying cadavers and associating cadavers with burial sites.

106: The impact of saturation status on the regulation of yeast acyltransferase Gpc1

Shane Conklin

Biology | Bayer School of Natural and Environmental Sciences | Senior
Faculty Advisor: Jana Patton-Vogt, Ph.D.

ABSTRACT: A vital component of cell viability is membrane homeostasis, which includes lipid synthesis, lipid turnover, and alterations in lipid saturation status. Phosphatidylcholine (PC) is a major membrane phospholipid in eukaryotic cells. The novel PC Deacylation-Reacylation Pathway (PC-DRP) remodels phosphatidylcholine through cleavage of its acyl chains, followed by two reacylations. The first acylation is catalyzed by Gpc1, and results in an increase in PC saturation status. To further explore the relationship between Gpc1 and membrane saturation, we provided *Saccharomyces cerevisiae* with saturated and unsaturated fatty acids. Expression was assessed for GPC1 and OLE1, the sole desaturase in *Saccharomyces cerevisiae*. Additionally, we probed for GPC1 expression upon downregulation of OLE1 transcription. Induction of the UPR was also monitored. Our results indicate that GPC1 expression is responsive to fatty acid saturation.

107: The Impact of Violence and Warfare on Mental Health in Global Health Contexts

Hannah Kupetz

Physician Assistant | Rangos School of Health Sciences | Junior
Faculty Advisor: Anna Scheid, Ph.D.

ABSTRACT: Violence and war cause serious psychological problems for both combatants and noncombatants, while also creating a ripple effect on global health.

Considering noncombatants, one in four children live in an area directly affected by armed conflict (1). These children are more likely to develop psychological problems, like PTSD, anxiety, and depression, and they are also more likely to use violence themselves when faced with conflict (2). Noncombatants are also affected by rape when it is used as weapon of war, causing devastating impacts on women's mental health and self-worth (2).

Combatants, who are usually men, suffer profoundly serious psychological effects resulting from participating in and witnessing gruesome or dehumanizing violence. Unfortunately, the social stigma around mental illness discourages men from seeking help, making their problems even worse (3).

Finally, war can have a domino effect that impacts other areas related to global health, including reducing access to food, healthcare, and economic security. As these hardships show, violence is just one aspect of war that causes poor mental health; social and economic factors related to war also contribute to mental health conditions.

My poster shows the effects on how war and violence harm the mental health of noncombatants and combatants alike, both during the war and post-war for many years to come.

Works Cited

1. Betancourt, T. S., Keegan, K., Farrar, J., & Brennan, R. T. (2020). The intergenerational impact of war on mental health and psychosocial wellbeing: Lessons from the longitudinal study of war-affected youth in Sierra Leone. *Conflict and Health*, 14(1). doi:10.1186/s13031-020-00308-7
2. Levy, B. S., & Sidel, V. W. (2008). War and Public Health: An Overview. *War and Public Health*, 3-20. doi:10.1093/acprof:oso/9780195311181.003.0001
3. Droždek, B., Rodenburg, J., & Moyene-Jansen, A. (2020). "Hidden" and Diverse Long-Term Impacts of Exposure to War and Violence. *Frontiers in Psychiatry*, 10. doi:10.3389/fpsy.2019.0097

108: The impact of zinc pyrithione and coconut oil on the microbes associated with dandruff

Suzannah Costa

Biology | Bayer School of Natural and Environmental Sciences | Senior

Faculty Advisor: Wook Kim, Ph.D.

ABSTRACT: Microbes form distinct communities on various parts of the human body that directly and indirectly impact our health. The scalp is uniquely dominated by three microbes: *Malassezia restricta*, a fungus, and two bacterial species, *Cutibacterium acnes* and *Staphylococcus epidermidis*. These organisms likely manifest a symbiotic relationship, and recent studies indicate that characteristic shifts in their relative frequencies – a decrease in *C. acnes* and an increase in *S. epidermidis* and *M. restricta* – is strongly correlated with dandruff. Thus, *C. acnes*'s fitness appears to be an important indicator of a healthy scalp. Many anti-dandruff shampoos contain an ingredient called zinc pyrithione (ZPT), which is described to suppress fungal growth. Coconut oil is another common ingredient, largely

reflecting social beliefs of its broad healing properties. However, these shampoos only provide transient relief, requiring constant use to control dandruff symptoms. We hypothesize that ZPT and coconut oil impact all dominant microbes of the human scalp to influence the symbiotic balance. To test this, we assessed the in vitro growth of the microbes in monoculture against concentrations of ZPT or coconut oil. Our results indicate that ZPT does not appear to be fungus specific as indicated, since it produced toxicity against all microbes. Additionally, coconut oil does not appear to impact the growth of any of the microbes in a consistent manner. These findings raise caution that ZPT functions like a broad-spectrum antibiotic, potentially stripping away microbes necessary to maintain a healthy scalp, and coconut oil may not be an effective agent for dandruff treatment.

109: The Interwoven Paradigm of Death Anxiety and the Mind

Rachel Ehrlichman

Psychology | McNulty College and Graduate School of Liberal Arts | Senior
Faculty Advisor: Garri Hovhannisyan, MA

ABSTRACT: This presentation dialogues three distinct literatures in order to deepen our psychological understanding of the phenomenon of death anxiety—defined as anxiety around the safety of self. On the one hand, existential psychologists have long discussed experiences of death anxiety in a variety of contexts, demonstrating its centrality to the human condition. On the other hand, personality psychologists have developed rigorous methods of studying individual differences in how people tend to think, feel, and behave in their worlds. However, the question of individual differences in ways of experiencing death anxiety has not yet been raised. Utilizing the perspective of the Big Five, we can begin to bridge this gap by articulating a preliminary conceptual account of the relationship between personality traits and death anxiety. Through this lens, humanity’s innate capacity for self-preservation is expressed through the traits as a dispositional tendency. With this thematization in mind, I discuss and synthesize recent findings in the cognitive science of personality and individual differences in literatures with basic existential psychological understandings of death anxiety.

110: The Isolation of Type 1 secretion signals in *Asaia borgorensis*

Marissa Bennett

Biology | Bayer School of Natural and Environmental Sciences | Senior
Faculty Advisor: David Lampe, Ph.D

ABSTRACT: Malaria is caused by parasites in the genus *Plasmodium* and is transmitted by *Anopheles* sp. mosquitoes. Transgenic modification of the symbiotic bacteria in the mosquito midgut can be used to change the phenotype of the mosquito, a process called paratransgenesis. *Asaia bogorensis*, a Gram-negative bacterium, is a symbiont known to colonize the *Anopheles* sp. midgut, salivary glands, and ovaries. This bacterium was previously successful at reducing the *Plasmodium* infection of mosquitoes when engineered to secrete scorpine, an antiplasmodial effector protein. Production of these antiplasmodials, especially the effector scorpine, can have a toxic effect on the host bacterium, which can lead to fitness costs. The current Type II secretion signals may be impeding bacterial fitness by causing the effectors to get “stuck” within the periplasm. We are working to identify Type I secretion

signals and bypass the periplasm by using the C-terminal 100 amino acids of potential Type I signals. These are long, and our current goal is to reduce the length of the sequence to the smallest possible size. We reduced the signal size 50 amino acids and fused it to GFP in *A. bogorensis*, followed by testing for glowing and secretion. The length of Type I signal sequence will be further reduced in 10 amino acid increments to isolate the shortest functional signal.

***111: The Misrepresentation of Native Americans in Textbooks in the United States**

Haley Oroho

History/Political Science | McNulty College and Graduate School of Liberal Arts | Sophomore
Faculty Advisor: Andrew Simpson, Ph.D.

ABSTRACT: Textbooks within the United States especially regarding elementary and middle school students have misrepresented Native Americans predominantly ensuing the arrival of European settlers since precolonial history is typically examined through the eyes of European settlers. Primarily students from k-12 learn about the history of the United States, and a significant portion of that history includes Native Americans, yet their point of view is usually not included or limited in textbooks. This has been a reoccurring issue with American textbooks for decades for several reasons including racism, limited access to certain resources, and not having authors with a focus in Native American history. This paper will look at a range of different textbooks from the 1970s to the most recent editions in order to compare how certain events are portrayed in these textbooks over time. The paper will also provide evidence from primary sources connected to these events such as Columbus's journal. The reasoning is to show how textbooks have different portrayals of a specific event, but the one consistency is that some of the information within textbooks is inconsistent with Native American accounts of the situation. This matter is continually being ignored and has caused issues in the past and continues to have repercussions not only on students but also Native Americans. Publishers and authors of textbooks need to realize this error and create a new set of standards that their books must have in order to be inclusive and accurately represent history.

112: The Slavic Foundations of Pittsburgh Culture

Giannah Marasovich

Secondary Social Studies Education | School of Education | Junior
Faculty Advisor: Andrew Simpson, Ph.D

ABSTRACT: This research paper offers a new look at the makeup of societal and cultural norms in the greater Pittsburgh area. Historians have explained why so many people have immigrated to Pittsburgh, but there have not been direct connections made between that and the Slavic influences in Pittsburgh's culture. This research intends to argue that there is an increased Slavic influence on mainstream culture in Pittsburgh, Pennsylvania. And that this was caused by the high volume of Balkan immigrants that came to work in the booming steel industry post war. I have compiled a collection of primary and secondary sources to help make this argument. While doing my research for this project, I also conducted interviews with individuals of Slavic descent and visited the nationality rooms in the Cathedral of Learning at the University of Pittsburgh.

113: The Study of Hyoid Bone Fracture Patterns

Grace Stockmal

Forensic Science and Law | Bayer School of Natural and Environmental Sciences | Senior
Faculty Advisor: Pamela Marshall, Ph.D.

ABSTRACT: Commonly referred to as the “Hangman’s Fracture”, the hyoid bone in the neck has been observed to partially or completely break when compressed by a ligature in suicidal hangings and homicidal strangulations. Hyoid bones need to be studied to determine if they fracture differently between these two manners of death. Previous studies have determined differences in neck damage and frequency of thyrohyoid fractures, but scientists need to develop effective comparisons between the manners of death and patterns of fracture within the hyoid bone. It is proposed that homicidal strangulations by ligature will require more force and will result in higher frequencies of fractures to the body than the greater horns of the hyoid than in a suicidal hanging. To test this proposal, hyoid bones were collected from deceased patients, cleaned using an Oxi-Clean solution, and models were created by 3D-printing utilizing FibreTuff polymer. The Torbal FT Odyssey force gauge was used to measure the Newtons required to partially fracture these models and allowed observation of fracture patterns. Ligatures and ballistic head models with inserted 3D model hyoids were used to simulate suicidal hangings and homicidal strangulation methods. Future autopsies with unidentified manners of death involving asphyxiation and abrasive damage to the neck can investigate the hyoid bone for patterns of fracture that correlate to either suicide or homicide. Future cases like Jeffrey Epstein would have further investigation of the hyoid bone to determine a manner of death.

114: The Vital Role of the Nurse as an Important Contributor to an Interdisciplinary School-Based Asthma Clinic: Abstract

Marlana Werderber, Lindsay Currie, Madeline Johnston

Nursing | School of Nursing | Senior

Faculty Advisor: Angela Karakachian, Ph.D.

ABSTRACT: Underserved communities lack access to healthcare, which in turn leads to poor health and an increased risk for chronic illnesses. Preventative health services in underserved communities are a way of helping these communities stay healthy and reduce the increased demand on hospital systems. Community programs, such as a school-based asthma clinics, give children the opportunity to learn ways to prevent and control asthma symptoms, which may reduce the risk of hospitalizations.

The Duquesne University Center for Integrative Health implemented a school-based interdisciplinary asthma program, Caring for Asthma in our Region’s School children (CAREs) to deliver comprehensive asthma care across six elementary schools in Pittsburgh. Evidence shows that an interdisciplinary approach to patient care leads to better patient outcomes. The purpose of this project is to discuss the vital role of the nurse in an interdisciplinary CAREs care model. In addition, we will provide recommendations to improve CAREs. Qualitative data collection method was used to gather information on the nurse’s role in this interdisciplinary asthma program. The role of the nurse in this project was vital as the nurse was the coordinator and communicator for all providers. When healthcare professionals collaborate, children are healthy.

Nursing is known for its emphasis in holistic care and nurses are in unique position to collaborate with other healthcare providers to improve the quality-of-care children with asthma receive.

115: Therapeutic Potential of Novel Veraguamides and Sigma 2 Receptor Ligands for Triple-Negative Breast Cancer

Emily Tran

Pharmacy - 5th year | School of Pharmacy | Senior

Faculty Advisor: Jane Cavanaugh, Ph

ABSTRACT: Triple-negative breast cancer (TNBC) is a form of aggressive breast cancer that lacks hormone and growth factor receptor receptors, making TNBC particularly difficult to treat and limiting the treatment options to chemotherapy and radiation. Sigma 2 receptors are overexpressed in TNBC and can undergo receptor-mediated endocytosis. Therefore, ligands of sigma 2 receptors have the potential to act as targeted treatments for TNBC. Interestingly, veraguamides, natural compounds that are isolated from cyanobacteria, bind to sigma 2 receptors and are toxic to lung cancer cells. In this study, we tested cyanobacteria fractions, veraguamides isolated from cyanobacteria fractions, and known sigma 2 ligands for toxicity against TNBC cells. Our data suggest that some cyanobacteria fractions and veraguamides O and P, but not known sigma 2 ligands (PB28, SM-21, and GBR), reduce the viability of MDA-MB-231 TNBC cells. As TNBCs are a diverse group of cancers, we also explored the effect of the cyanobacteria fractions on other TNBC cell types, including BT-549 and MDA-MB-468 cells. Overall, our current data suggest that veraguamides are toxic to TNBC cells and this toxicity may be due to binding of veraguamides to the sigma 2 receptor and subsequent endocytosis of the veraguamide-sigma 2 receptor complex. Future studies will be aimed at isolating veraguamides using bioassay guided fractionation, testing the veraguamides against diverse TNBC cells, and exploring the mechanism of toxicity of veraguamides against TNBC cells.

116: Therefore, Fight!: The Bhagavad Gita's Perspectives on Death and Its Preparation

Savannah Spratt

English | McAnulty College and Graduate School of Liberal Arts | Sophomore

Faculty Advisor: Patrick Lee Miller, Ph.D.

ABSTRACT: Death is inevitable. There is no force with the ability to halt its plans, and this disturbing reality often lingers in one's mind relentlessly, without resolve. Luckily, there are ways to conquer this fear of death. In the Bhagavad Gita, death is conquered by teaching the tri-fold belief that a person must give up personal attachments and desires, fulfill God's (Brahman) duty (dharma), and ultimately attain a union with Brahman. This poster will analyze the philosophy and doctrine of the foundational Indian text of the Bhagavad Gita. Furthermore, this poster will include a demonstration of how this philosophy approaches death and, consequently, how one should prepare for death. I will relate these lessons in the Bhagavad Gita to how they can be relayed in one's own life. If one is a teacher, teach! A pilot, fly! A warrior, fight!

117: To be Reductionist or Non-reductionist

Jonah Lee

Biology and Psychology | McAnulty College and Graduate School of Liberal Arts | Junior
Faculty Advisor: Garri Hovhannisyan, MA

ABSTRACT: Reductionism is a position that favors the materialistic view of the world, reducing the whole down to its constitutive parts in the name of knowledge acquisition. Nonreductionism, on the other hand, holds that the whole is greater than the sum of its parts. It transcends human experience from mere concerted molecular interaction. Drawing on Cartesian thought, the scientific revolution, and a brief survey of near-death experiences, I build a case for the validity of understanding the world by including both nonreductionism and reductionism instead of accepting one and neglecting the other. I conclude that to accept only one of these positions at the exclusion of the other will limit our explanatory basis for the complex world. The implications of viewing the world through the narrow lens of just one of these approaches are that it can either jade our view of the world and strip it from meaningful experience or cast a constant elusive shadow on our understanding of the natural world, severely limiting human advancement.

118: Toward Improving Maternal and Infant Health Outcomes Through Use of Mobile Applications; A Survey

Kathleen Dunn, Amber Gorog, Adrienne White
Nursing BSN | School of Nursing | Senior
Faculty Advisor: Melissa Kalarchian, Ph.D.

ABSTRACT: Background: Mobile applications can help provide healthcare education to pregnant mothers, regarding gestational weight gain, infant feeding, and NICU information, to better the health of the mother and her infant. Methods: Mothers between the ages of 20 and 40 who were currently pregnant or have had a child in the last two years, completed an anonymous, online questionnaire via Qualtrics where they recalled any apps they used as well as details about their health and their infant's overall health throughout and after their pregnancy. Results: Thirty-eight responses were recorded with 34 complete responses able to be analyzed. Forty-seven percent (n=16) of participants had their provider discuss weight gain guidelines throughout their pregnancy with them. The survey also found that 58.8% (n=34) of participants chose to breastfeed their infants, 17.7% chose to bottle feed, and 23.5% chose a combination method. The primary influencer on mother's decision regarding infant feeding was online resources. Pertaining to mothers with infants in the NICU, the most common answer of those studied was that mothers were only "somewhat confident" in their understanding of the information received throughout their experience with only 1 of the 9 stating that they used a mobile app. Conclusions: This study can be used to bring awareness to inconsistencies with use of online resources for maternal health information. In the future, it could further app development to create apps with accurate information that will reduce maternal and neonatal morbidity and mortality through improving maternal knowledge and confidence.

119: Training, Education, and Certification of Forensic Document Examiners in the United States

Lauren Turnacioglu

Forensic Science and Law | Bayer School of Natural and Environmental Sciences | Senior Faculty Advisor: Lyndsie Ferrara, Ph.D.

ABSTRACT: Crime Television shows like CSI portray forensic scientists as perfect at their job, always getting the right answer easily in all of their cases. In real life, that is almost never the case. The field of forensics is not perfect. Regardless, the public still expects quality from the field. But how can accurate, quality service be guaranteed when the field lacks consistency in its methods of producing professionals? The field of forensic document examination does not have adequate standards that address the content of the training, education, and certification that examiners receive. It is hypothesized that examiners across the country will have significantly different levels of proficiency, training, and education. A survey will be conducted that will include sections on demographics, certification, training, education, and proficiency testing, and it will be sent to forensic document examiners across the United States, including both government and private laboratories. Qualitative and quantitative comparisons will be used to determine if there is significant variation among examiners employed at different laboratories. This research will indicate that status of training, education, and certification in the field, determine how pressing the need for standards is, and suggest what the content of the standards should be. This will allow for consistency throughout the field, and advance the knowledge on what the best practices are in regards to training, education, and certification, to produce competent, reliable experts.

120: Trends in Profiles of Offenders Caught using Forensic Genetic Genealogy (FGG)

Will Vause

Forensic Science and Law | Bayer School of Natural and Environmental Sciences | Senior Faculty Advisor: Pamela Marshall, Ph.D.

ABSTRACT: Trends in Profiles of Offenders Caught using Forensic Genetic Genealogy (FGG)

William Vause, B.A.¹, Lyndsie Ferrara, Ph.D.¹, Colleen Fitzpatrick, Ph.D.², Linda Doyle², Brian Kohlhepp, Det.^{1, 3}, and Pamela Marshall, Ph.D.¹

1. Forensic Science and Law Program, Duquesne University, Pittsburgh, PA 15282, USA.
2. Identifinders International, LLC, Fountain Valley, CA 92708, USA.
3. Ross Township Police Department, 1000 Ross Municipal Drive, Pittsburgh, PA 15237, USA.

Forensic Science and Law Program, Duquesne University, Pittsburgh, PA 15282, USA.

Forensic genetic genealogy (FGG) is a new tool in the forensic science community which allows violent offenders to be identified by genetic similarities their relatives share with a DNA sample. Since FGG is so new and limited in its use, it is important to examine the types of offenders FGG is successfully identifying in terms of previous criminal record and whether or not a sample is in CODIS. Currently, there are no studies effectively analyzing FGG with regards to trends in cases where it has been successfully used. In order to address this topic a way to analyze the cases which provided insight into variation in the offenders was developed. This entailed analyzing the case to determine the criminal record of the offender and whether or not they were in CODIS, as well as if a DNA was taken or should

have been taken. From there potential cases involving violent offenders were identified by research and Freedom of Information Act (FOIA) requests were subsequently filed. Through these the case files for each individual case were obtained which allowed criminal history, the date of the crime, and other key information to be identified. In cases where this information needed to be supplemented, certain detectives on these cases were contacted and interviewed. The research is vital because it helps to provide more insight into a fast growing field of forensic science and one that will surely be integrated into law enforcement techniques as it becomes more fully understood.

Keywords: Genealogy, forensic genetics, CODIS, cold cases

121: Trojans in the Aeneid Compared with Romans in De Bello Gallico

Parker Grisanti

Forensic Science and Law | Bayer School of Natural and Environmental Sciences | Freshman
Faculty Advisor: Sarah Miller, Ph.D.

ABSTRACT: In the Book 4 of De Bello Gallico by Caesar and the Book 1 of the Aeneid by Virgil, the Greeks and Romans in each respective piece of literature depict how each group face difficulties in coming to the shore safely, and each respective group are able to overcome their difficulties. Illioneus, of the Trojans, must persuade Dido in order for the Trojans to be allowed to take refuge in Carthage. The standard bearer of the Romans, on the other hand, performs a courageous action of jumping down from the Roman ships and leading the charge of the Romans to the shores. In ancient Roman history, if the standard bearer were killed in battle by the opposing forces, the battle was most likely lost because at that point there was no morale left for the surviving troops before the battle had ended. This poster will analyze and explore the significance of the Roman standard bearer's courage and Illioneus' speech to Dido, the queen of Carthage. By using excerpts from 4.25 of De Bello Gallico, and lines 521-529 and 539-543 from Book 1 of the Aeneid, this poster examines the importance of each of these excerpts and what ways Illioneus and the Roman standard bearer are able to overcome the challenge of making it safely to the shores and staying there. This poster directly analyzes how difficult it was for each of these respective groups to make it to the shore, whether that be the shores of Carthage or Britannia, and how each group found a way of persuasion to overcome their hurdle of arriving to the shore.

122: Understanding Lawyer's and Judge's Knowledge of Forensic Science

Nicole Seuferer

Biology | Bayer School of Natural and Environmental Sciences | Senior
Faculty Advisor: Lyndsie Ferrara, Ph.D.

ABSTRACT: Lawyers have very little, if any, science courses in law school, thus when they enter into the field, they have a lack of education in science. The lack of understanding forensic science is a contributing factor to wrongful convictions. Additionally, there needs to be an increase in forensic science knowledge taught to legal professionals to enhance conviction integrity. This learning gap is crucial to judges as they have to be prepared to comprehend what scientific evidence should be allowed into the courtroom. While lawyers must know how to effectively direct or cross-examine experts

(challenge qualifications and methodology). The goal of this research is to understand the current forensic science education of criminal lawyers as they present and challenge scientific information. It aims to understand the forensic science knowledge that judges need to know as they act as the gatekeepers in determining the admissibility of evidence. Through a survey and interviews, the education of legal professionals can be better understood. The survey asked lawyers and judges their legal background, experience, and confidence in specific forensic science disciplines and any feedback regarding forensic science education available to legal professionals. The interview gave more detailed responses on views of forensic science education in the legal community. Results indicate the areas where lawyers and judges have less confidence presenting during trials. Knowing exactly where the lack of forensic science knowledge is will help determine what specific areas of forensic science need to be taught more to enhance conviction integrity in the courtroom.

123: Urea and Thiourea: Special Cases in Quantum Chemistry

Lindsay Moskal

Chemistry and Mathematics | McAnulty College and Graduate School of Liberal Arts, Bayer School of Natural and Environmental Sciences | Junior

Faculty Advisor: Jeffrey D. Evanseck, Ph.D.

Additional Authors: Serina Tressler, Thomas D. Montgomery (faculty)

ABSTRACT: As recognized by the 2021 Nobel Prize in Chemistry, small organic molecules like urea and thiourea have become increasingly prominent in organocatalysis and have impacted the chemical industry significantly. Such small organic molecules are popular core motifs of larger catalysts known as dual-hydrogen-bond-donors (DHBDs), which are safer, greener, and more cost-effective alternatives to the metal catalysts frequently used in pharmaceutical processes. Despite the importance and utility of DHBDs, experiments and computations on the structures, energies, and vibrations of unsubstituted ureas and thioureas are not in agreement. Previous computations predict an intuitive nonplanar geometry known as anti- and an unusual syn-conformation. However, experimental studies could not locate the syn-conformation. This disagreement has resulted in a perennially unresolved conundrum which indirectly hinders the innovation and development of novel DHBDs to replace harmful, environmentally destructive, and expensive metal catalysts. Our work, therefore, takes a systematic and complete approach in defining the structures, energies, and vibrations of urea and thiourea using state-of-the-art quantum chemistry. We find that urea and thiourea are special cases in quantum chemistry. Typically, quantum predictions do not require formally correct approximations to yield experimental agreement. However, for urea and thiourea, we find that the inclusion of the complete basis set limit, zero-point energy, and anharmonic vibrations eliminates the syn-conformer as a possible ground state. Thus, we conclude that only the anti-conformation exists with a large-amplitude motion, which explains the experimental observations. These findings will help the organocatalysis community to design DHBD catalysts for safer, greener, and more cost-effective pharmaceutical processes.

124: Use of New Procedure for the Synthesis of Sulfonylureas

Alexis Duda

Chemistry | Bayer School of Natural and Environmental Sciences, School of Pharmacy | Junior

Faculty Advisor: Patrick Flaherty, Ph.D.

ABSTRACT: Sulfonylureas are a well-established category of bioactive molecules used to treat a variety of diseases from diabetes to bacterial infection. Identification of the inwardly rectifying potassium channels SUR1 and SUR2 as the therapeutic target of sulfonylureas recommend additional scrutiny of this class of compounds along with their known and potential targets. In the course of examining the physical chemical properties of aryl sulfonylureas new reliable methodology was required. Synthesis of a series of sulfonylureas with in-situ formation of isocyanates from precursor carbamic chlorides or O-siloxy carbamates with direct capture by sulfonamides is presented. These new strategies generate sulfonyl ureas in an atom-efficient manner with identical chemical characterization to prior methods proceeding via traditional carbamate, carbonate, or externally prepared isocyanate approaches.

125: Using Flow Cytometry to Study Vertebrate Brain Development using Northern Leopard Frogs (*Lithobates pipiens*).

Madison Uhrin

Biology | Bayer School of Natural and Environmental Sciences | Senior

Faculty Advisor: Sarah Woodley, Ph.D.

ABSTRACT: Vertebrate brain development is sensitive to environmental stimuli which impact neural cell growth, differentiation, and function. Frogs are excellent model organisms for vertebrate brain development because they develop separately from maternal influence and can thus be directly manipulated and studied. Previous studies have shown that there are structural differences between tadpole and metamorphic frog brains, however, the reason for these structural differences is unknown. To determine whether these differences in brain shape are reflected in cell populations, we used flow cytometry, which is a method of quantifying cell types. Because the use of flow cytometry in frog brains is novel, we first sought to validate its use by comparing tadpole and metamorphic frog brains. We used antibodies for Nestin and NeuN to determine the percentage of neural stem cells and mature neurons, respectively. We predicted that tadpoles would have a greater percentage of Nestin-positive cells, whereas metamorphs will have a greater percentage of NeuN-positive cells, consistent with developmental stage. There was no difference in the number of NeuN or Nestin reactive cells between tadpoles and metamorphs. However, unexpectedly, metamorphs had greater median cell size and cell complexity compared to tadpoles. To conclude, flow cytometry is a promising method for assessing differences in brain cell populations in developing amphibians, although additional validation is necessary. Future work includes comparing fresh and fixed tissue and exploring how environmental stressors impact brain development.

126: Using Forensic Anthropological and Genetics Techniques to Analyze Ancient Human Skeletal Remains (From Rhodes, Greece)

Dylan Baxter

Forensic Science and Law | Bayer School of Natural and Environmental Sciences | Senior

Faculty Advisor: Lisa Ludvico, Ph.D

ABSTRACT: Human civilization has evolved by incredible leaps and bounds over the course of

history. To properly study it we must not only look at history, but also fields like anthropology, genetics, and even forensic science to gather as much information as possible. This study incorporates the use of classical osteology methods, along with x-rays, as well as genetic data from cutting edge techniques such as Massive Parallel Sequencing (MPS) to obtain information from human skeletal remains from Rhodes, Greece. The remains are approximately 1,500 years old which presents unique challenges in recovering DNA and making certain anthropological determinations because of their condition. Using the MiSeq™ MPS platform will allow for phenotypic and ancestry information via Single Nucleotide Polymorphisms (SNPs) and determination of individual relatedness among those buried in the grave site via Short Tandem Repeats (STRs). Preliminary anthropological data show that there are 2-4 individuals from the site. There is evidence that the individuals had healthy diets and were well taken care of. At least one individual had a gracile build and at least one had a robust build which could indicate that there are both sexes present in the remains. Further genetic testing will be completed to determine sex along with the ancestry and phenotypic information.

127: Using Logbooks to Support Home Practice for People with Aphasia

Katherine Janov (Speech-Language Pathology, Mariana Pacheco (Occupational Therapy), Katherine Janov (Speech-Language Pathology)

Rangos School of Health Sciences | Senior

Faculty Advisor: Elena V. Donoso Brown, Ph.D., OTR/L

Additional Authors: Sarah E. Wallace, Ph.D., CCC-SLP (faculty), Jaime Lee, Ph.D., CCC-SLP (faculty), Callie Schweizer, MS, CF-SLP (student author), Kaitlyn Holtz, B.S. (student author), Qianwen Liu (student author)

ABSTRACT: Background: Home practice programs provide a low-cost mechanism to help people with aphasia make meaningful gains in reading comprehension. However, factors that enhance adherence to home programs are poorly understood. A logbook that clients record their completed practice is one potential mechanism that could support adherence. Information about the use of logbooks for individuals with aphasia is important for creating home programs that will improve rehabilitation outcomes.

Method: We utilized a non-concurrent multiple baseline single-subject design to explore the effect of utilizing logbook on adherence to practice. Materials included an iPad and mobile application, Advanced Language Therapy by Tactus Therapy, with passages and activities designed for people with aphasia.

Study procedures occurred in-person and virtually. Written materials contained large font size, simplified text, and relevant images. First, participants completed standardized language and cognitive assessments, and self-efficacy questionnaires. Next, participants were trained on the use of the app and asked to practice for 80 minutes every day. Baseline phases varied from 2-4 weeks. Then participants were asked to record the amount of practice completed using a timer and the logbook.

Results: Data collection and analysis are underway. We will present data from four participants with chronic aphasia. A complete visual analysis of total minutes practiced per day, adherence rates, comprehension accuracy, and pre/post scores from the reading tests will be included. Statistical analyses will quantify potential treatment effects and corroborate visual analysis findings.

Discussion: Based on these four cases, we will provide clinical implications and future research directions.

128: Using pS6-immunoreactivity as a marker of neuronal activity in the context of salamander reproductive behavior.

Jenna Mulreany

Biology | Bayer School of Natural and Environmental Sciences | Junior

Faculty Advisor: Sarah Woodley, Ph.D.

ABSTRACT: Pheromones are chemical signals that trigger a social response between individuals of the same species. To better understand how pheromonal and other reproductive cues are processed by the brain, I used immunohistochemistry (IHC) for phosphorylated ribosomal protein S6 (pS6), which is a potential indicator of neural activity. I designed an experiment to test the hypothesis that cues associated with mating will increase amounts of pS6 in the brain in terrestrial salamanders. I predicted that male-female pairs that successfully mated will have higher amounts of pS6 in the brain compared to pairs that did not mate, and unpaired salamanders. I also included a positive control of salamanders that were handled to induce a stress response. Tissues were fixed and sectioned using a cryostat. I am currently completing IHC and gathering data. If successful, the method of pS6 could be used to examine neural activation in response to many sensory cues to better understand neural processing by the amphibian brain.

129: Well Child Wednesdays: An Interprofessional Pilot-program to Increase Pediatric Immunizations Post-Covid

Sylvia Lombardo

Pharmacy | School of Pharmacy | Senior

Faculty Advisor: Autumn Stewart-Lynch, PharmD

ABSTRACT: Objectives

To describe the development and impact of a multidisciplinary, pilot, catch-up immunization initiative directed at increasing the number of pediatric immunizations and wellness visits within a family medicine practice during the aftermath of the COVID-19 pandemic.

Methods

Pharmacy students, medical residents, and nurses within a family medicine clinic collaborated to create a 4-week, pilot-program that incorporates “Well Child Wednesday’s” into the site’s workflow with minimal additional labor. Pharmacy students reviewed profiles of patients age 12 and younger within the practice, contacted guardians to schedule a visit, and made their vaccination recommendations based off of the CDC immunization schedule to the nurse. The nurse administered the appropriate immunizations to each child and the medical resident completed the well-child visit. A designated room was used to complete these visits to avoid any additional risks of exposure to COVID-19.

Results

193 patient charts were reviewed for immunization needs and of these, 68 were not up-to-date on routine pediatric vaccines. 29 children were scheduled and 69% of these patients attended their visit. A total of 69 vaccines were administered. Additional data on the types of vaccines administered and patient demographics will be presented.

Conclusion

An interprofessional immunization program within a family medicine practice is one strategy to address the current decline in immunizations and protect children who are at risk for vaccine-preventable diseases. A program such as this can have a positive impact on ensuring that children are not falling behind with their healthcare needs during the pandemic.

130: Student withdrew.

131: Court Proceedings During the COVID-19 Pandemic

Julianna Firek

Forensic Science and Law | Bayer School of Natural and Environmental Sciences | Senior
Faculty Advisor: Lyndsie Ferrara, Ph.D.

ABSTRACT: As of March 2020, the courts shut down, along with the rest of the world. During this unprecedented time, figuring out a way to continue with legal proceedings was a difficult feat that each court did independently, without universal guidelines. Prior to the pandemic, the court was extremely slow to make changes, but the pandemic forced many quick changes along with significant investment into new courtroom technology. These significant changes are important to document and analyze.

The goal of this research was to collect firsthand accounts of court adaptations and operations throughout the pandemic. Interviews were conducted of various professionals within the court system to gather information on their experiences during the pandemic. Interviews were conducted across different jurisdictions to compare the changes each court made. These interviews were conducted via zoom and the responses were compared to each other and what was found in literature. This comparison identified challenges confronting the court system as well as elicited unique perspectives specific to different jurisdictions.

Documenting how the courts adapted is important for future events that may require virtual court as well as for analyzing if operations were effective and fair. As the pandemic continues, court operations continue to adapt. This research provides a retrospective analysis of courtroom operations that shifted to fully virtual proceedings up through re-opening efforts and hybrid models. After analyzing how virtual proceedings were executed during COVID brings the discussion of which parts can remain virtual post-pandemic.

132: The Role of Occupational Therapy at Shepherd's Heart House of Hope

Amanda Dean, Emily Hall, Caitlin Ulrich

Occupational Therapy | Rangos School of Health Sciences | Senior
Faculty Advisor: Ann Stuart, OTD, OTR/L

Additional Authors: Ann Stuart, OTD, OTR/L (faculty)

ABSTRACT: The Role of Occupational Therapy at Shepherd’s Heart House of Hope

Shepherd’s Heart House of Hope provides transitional housing to veterans experiencing homelessness in the Pittsburgh area. This video will explain the role occupational therapy within Shepherd’s Heart and how OT services support independent living skills and residents’ valuable interests. The primary goal of occupational therapy is supporting individuals in engaging in what they want to do, need to do, and are expected to do. As students at Shepherd’s Heart, it was critical to create equitable opportunities for engagement in meaningful activities including community engagement, independent living skills, and stress management.

133: Myoelectric Adaptation of a 3D-Printed Prosthetic Arm

Alexander Guy

Biomedical Engineering | Rangos School of Health Sciences, Biomedical Engineering | Junior
Faculty Advisor: Richard Simpson, Ph.D, ATP

ABSTRACT: Prosthetic limbs serve a wide range of purposes, from being purely cosmetic to fully functional. While fully functional are preferred, they are usually very expensive because of electronics and are inaccessible for many families. With the rise of 3D printing, these functional prosthetics have become cheaper and more accessible but are limited to movement produced by the body. For this project, a 3D-modeled left prosthetic arm, originally designed for mechanical movement, was remodeled to house and function electronic for use for an adult. After modifications were made within CAD modeling software, the arm parts were then printed, assembled, and wired to function with electronic motors. A microcontroller was coded to allow for motor control and external power sources were added to allow to user to freely move around without the need to be always connected to a computer. The motors were tested with switches to allow the hand to grasp common household objects. A myoelectric sensor, used to measure signals sent through muscles when they move, was then successfully added in place of the switches to allow for the user to open and close the hand without the need for interacting with switches. This adaptation successfully demonstrates the practicality of making effective and cost-efficient motorized limbs in one's own home.

***134: Valve Replacement Combined Surgical Device**

Selvin Hernandez, William Miller (BME), Nicholas Shaffer (BME), Jonathan Wehner (BME), Ian Ferris (BME, Nursing)

Rangos School of Health Sciences | School of Nursing | Senior
Faculty Advisor: Leda Kloudas, Ph.D.

Additional Authors: Leda Kloudas, Ph.D. (faculty)

ABSTRACT: Cooley Scissors and the Freer elevator are two of the most important tools used for cardiovascular surgery. During the removal of a calcified aortic valve, Cooley scissors are used to cut the

valve while the Freer elevator is used to scrape and remove calcium deposits on aortic walls. A cardiovascular surgery team expressed the need for a new device that could accomplish these functions in one device. Creating this novel combination tool works towards solving two problems. The first being patient safety; surgeons remove instruments from the chest cavity and re-enter at arguably the most crucial point in surgery. The second problem is tool cramming; roughly 100-200 separate surgical instruments are used during this procedure. There is no existing device that combines these surgical tools, making our project innovative in the scientific field as well as the medical market. We present a novel surgical device prototype that combines the Cooley Scissors and the Freer elevator. We have developed a 3D printed device made from Polylactic acid (PLA) which mimics the shape of surgical scissors with a modified point to perform scraping. Tapering the point down to the thickness of Freer elevators allows for optimal scraping while maintaining full cutting functions. Additionally, knurling the shaft of the device adds to device grip and stability during use. Lastly, this combination device reduces the number of steps required for use during operation making surgeries more efficient than before. Risk analysis along with design verification and validation are being conducted during prototype development.

135: Assistive Device for Bilateral Fine Motor Coordination Impairments

Jordan Houseworth, Jessica Towns, Carlie Hernjak, Ethan Herstek
Biomedical Engineering | Biomedical Engineering | Senior
Faculty Advisor: Leda Kloudas, Ph.D.
Additional Authors: Leda Kloudas, Ph.D. (faculty)

ABSTRACT: Patients who have suffered from stroke, multiple sclerosis, arthritis, and other debilitating diseases have experienced loss of function in one or both hands. Although rehabilitation activities to counter hand impairment are profuse, patients who don't regain full grip strength require assistance to carry out daily activities. Current assistive devices are difficult to use for those who lack grip strength in both hands. Specifically, patients who have suffered bilateral hand impairment may rely on an occupational therapist to complete simple tasks. The aim of this project is to develop an assistive hand device for patients with bilateral fine motor impairments. The device meets four essential needs including usability by target population, attachments specific for user's daily needs, sizing scale for a range of ages, and ability to be disinfected and properly cleaned. The major component of the device is a magnetized adjustable band that fits around the patient's hand. It is used in conjunction with magnetized attachments for user-specific tasks (e.g. hair-brushing, eating, brushing teeth). The device also includes a base stand that attaches to the grip component. The user will be able to independently remove and attach the grip band by placing the hand on the magnetic surface of the stand and sliding in or out. An additional component on the base stand facilitates removal of the task-specific attachment from the grip band. We expect that this device will aid users performing tasks independently and in a comfortable manner.

136: Airway Management Device for Sedated Patients

Alec Skomo, Benjamin Kazimer, Matthew Nestler, Christina St. Clair
Biomedical Engineering | Biomedical Engineering | Senior
Faculty Advisor: Leda Klouda, Ph.D.

Additional Authors: Randall Rawa, MD

ABSTRACT: Surgery involving sedation can encounter problems involving the blockage of the patient's airway. To solve this, medical professionals manipulate the head or perform invasive procedures to maintain the airway. This is a problem due to the nature of invasive procedures, or the waste of skilled manhours manipulating the head for the duration of the surgery. The labor of maintaining the airway is a common complaint among anesthesiologists. Our work aims to create a medical device prototype that positions the head during surgery to reduce the instances of blocked airways. We have investigated the problem with medical professionals, analyzed existing devices common in surgery, and made a series of prototypes involving head positioning. The positioning of the head into a "sniffing position" with the chin up aids in opening airways. Emphasis has been placed on adaptability to different patient populations and procedures while avoiding pressure points. We have created a refined prototype consisting of a polymer base and adaptable cushioning that appropriately positions the head of a patient.

137: The Ethical Considerations Presented by "The Immortal Life of Henrietta Lacks"

Natalia Bentz

Psychology | McAnulty College and Graduate School of Liberal Arts | Freshman
Faculty Advisor: Lauren Crivellaro

ABSTRACT: The Immortal Life of Henrietta Lacks by Rebecca Skloot follows the story of a black woman who suffered from cervical cancer in the early 1950s, and the hospital's clandestine use of her cells for scientific research without her informed consent. The Immortal Life of Henrietta Lacks is a story about exploitation of Henrietta's family for generations. The hospital's failure to obtain Henrietta's informed consent, the medical community's public disclosure of information pertaining to Henrietta, and the biotechnology companies' refusal to pay profits to Henrietta Lacks' family had an immeasurable negative impact on the lives of Henrietta's descendants. However, the bioethical issues presented in "The Immortal Life of Henrietta Lacks" are not limited to the 1950's as the questions about informed consent and the use of a patient's body for scientific research are contemporary problems faced by the scientific and medical communities today. This poster shows that a new conversation is needed about the importance of consent and how that is obtained by the family for the use of a patient's body for medical and research purposes.

138: Open-air 3D Bioprinting of Complex and Physiologically Relevant Tissue Structures

Burton Carbino, Kayla Kraeuter

Biomedical Engineering | School of Pharmacy, Biomedical Engineering | Junior
Faculty Advisor: Bin Yang, Ph.D

Additional Authors: Nathan Lingenfelter (Graduate student), Jelena Janjic, Ph.D (faculty), Bin Yang, Ph.D (faculty), Kimberly Williams, Ph.D (faculty)

ABSTRACT: Three-dimensional bioprinting is a promising technology for developing artificial organs. Using a variety of protocols and techniques, clinicians can now incorporate biologically relevant scaffold materials, cells, and growth factors into patient-specific tissue scaffolds. While these bio-interactive

scaffolds can take many forms (such as organ-on-a-chip models, tissue grafts, and even entire organs), all emulate specific qualities of living tissue. Typically, soft gel materials such as collagen type I or Pluronic F-127 are employed for 3D bioprinting tissue scaffolds because they are biodegradable, biocompatible, cost effective, and mechanically similar to their natural counterparts. The viability of a 3D printed hydrogel scaffold is mainly dependent on print settings (temperature, pressure, speed), and the morphology of the structure being printed. Reliably bioprinting hydrogels into complex shapes is equally challenging and promising for the future of tissue engineering/regenerative medicine research.

We propose a method for open-air FDM 3D bioprinting of complex, physiologically relevant tissue structures made of Pluronic F-127: a temperature sensitive, biodegradable hydrogel bio-ink. Our goal for this study is three-fold: design, print, and optimize the parameters necessary for printing intricate biological structures. Lattice and tube-shaped models were the focus of our evaluations since both mimic connective tissue and vascular structures, respectively. Individual model morphology was edited on CAD software and printed on the Allevi 1 bioprinter. Qualitative analysis of each structure is presented, and model fidelity is compared to idealized, physiological counterparts. Based on these preliminary results, we plan to further investigate cell seeding and vascular blood flow in accurate artificial organ structures.

139: Personality, Vaccines and Conspiracy

Anna Courtney (Psychology), Hannah Aroesty (Psychology), Lauren Wessel (Psychology and Integrated Marketing Communication)

Psychology | McAnulty College and Graduate School of Liberal Arts | Junior

Faculty Advisor: Alex Kranjec, Ph.D.

ABSTRACT: Understanding the qualities that contribute to anti-vaccine or other conspiracy attitudes may help prevent further polarization in society. Previous studies showed a correlation between belief in vaccine conspiracies and self-reported personality disorder symptoms in the general population. We were interested in surveying members of social media forums for anti-vaccine discussion. To determine the general personality traits that make a person more or less likely to align with extreme views or conspiratorial beliefs, we used the 60 question HEXACO Personality Inventory, the Comprehensive Intellectual Humility scale, and The Vaccination Attitudes Examination Scale to determine correlations. We predict that those with higher scores for emotionality and honesty-humility, lower scores for agreeableness and openness and low scores on the Intellectual Humility scale to experience were more likely to align with extreme views or conspiracism in relation to vaccination attitudes. This research will further our understanding as to why certain people refuse vaccinations on account of various attitudes toward medicine/government, a “natural immunity” and anti-modern medicine attitude, and particular religious beliefs.

140: “Healthy” Alternative

Brandan Davis

Integrated Marketing Communications | McAnulty College and Graduate School of Liberal Arts | Senior

Faculty Advisor: Carla Richards, Ph.D.

ABSTRACT: Vaping seemed to hit the scene with a bang around the early 2010's marketed as the 'solution' to address nicotine addiction in large segment of the population. Vaping, advertised as a 'healthy alternative' to smoking is a questionable argument which is specifically aimed to benefit the tobacco industry. With the rise of targeted marketing geared towards young adults who are addicted to this new 'safer' nicotine delivering devices, health experts may argue otherwise.

For this essay, I aim to dissect methods from studies dealing with vaping and public comments on Twitter. By analyzing studies focused on public comments via Twitter and national news stories regarding vaping, a better understanding of both targeted marketing and vape usage can be understood. "And although E-cigarettes and smokeless tobacco are significantly less dangerous than cigarettes, the empirical question remains about the possible net public health effects of promoting non-combusted tobacco and nicotine products" (Kozlowski 22). With the goal to explore the notion of captive audience and influences on young adults I aim to assess the ethical implications of targeted marketing central to the vape industry. By unpacking results from Damiano et al.'s study specifically pointing out failure to recognize risks of using vapes and e-cigarettes ethical implications for marketing will be better understood.

Keywords: Vaping, marketing, young adults, implications

Works Cited

Damiano, Amanda D., and Jennifer R. Allen Catellier. "Up in Smoke: A Content Analysis of Tweets during the Vaping-Related Illness Epidemic." *Journal of Communication in Healthcare*, vol. 14, no. 1, Mar. 2021, pp. 41–49. EBSCOhost, doi:10.1080/17538068.2020.1767980. (Paragraph 3)

Kozlowski, Lynn T. "A Policy Experiment Is Worth a Million Lives." *Issues in Science and Technology*, vol. 32, no. 2, 2016, pp. 20–23. JSTOR, www.jstor.org/stable/24727027. Accessed 3 May 2021.

141: BabyBot: A Robotic Testing Device for Infant Cognition

Elyssa El-Hajj, William Miller, Burton Carbino, Raegan Gouker

Biomedical Engineering | Senior

Faculty Advisor: Kimberly Forsten Williams, Ph.D.

Additional Authors: Rocco Turano (undergraduate at University of North Carolina School of the Arts), Regina Harbourne, Ph.D. (faculty), Kimberly Forsten Williams, Ph.D. (faculty).

ABSTRACT: Early infant problem-solving encompasses the ability to control the body in new ways and attend to new experiences. Infant problem-solving is traditionally tested by using the A-not-B paradigm, in which the child reaches to an object in one location repeatedly and must reallocate attentional resources when the object location changes. The ability to perform this testing for our National Science Foundation grant (#1941122) was hampered by contact restrictions due to COVID-19. Development of a mechanical testing device that could simulate the test without contact was desired. BabyBot 1.0, in which a piston mechanism pushed toys down a wooden shoot, into a well in which the baby could then access the toy was developed. Pilot testing revealed features that needed revision including the size of the device, the sound produced, and the object delivery to the infant. We redesigned the device to address these limitations by reevaluating the user needs of the research team and issues regarding infant behavior noted during testing. For BabyBot 2.0, a filing box served as a base,

and colorful balls were used as the attractant toy. We used 3-D printing to create lightweight ramps to deliver the toys, paddles attached to an electronic servo to release the toys, and attachable trays for presentation. To draw attention to toys, LED lights were added. An Arduino board programmed the toy presentation and controlled the servos and the LEDs. A wired remote was added for device control from a distance. BabyBot 2.0 is easily transportable uncomplicated for user convenience.

***142: Human Trafficking: Violations against Human Rights and its Effects on its Victims
(Virtual Participation Only)**

Angel-Inez Feschuk
education | School of Education | Senior
Faculty Advisor: Robin Chapdelaine, Ph.D.

ABSTRACT: Human trafficking is an infringement on human rights as it violates individuals right to life, liberty, and security, and so much more. Trafficking originates where there are already signs of human rights being deprived, as traffickers tend to target people who are vulnerable. This is due to the root of the problem being related to poverty, economic inequality, gender, homelessness, or structural violence. This is a global issue, as human rights are universal, and the victims of trafficking are entitled to the full range of human rights, no matter where they are from, their age, or sex. Throughout my research, I will discuss the different forms of human trafficking, the infringements they place on human rights, individual cases studies, and different international policies set in place by global organizations to protect human rights and to prevent trafficking and whether they are effective or not.

143: Separating Art from the Artist

Tariq Rafi Daniel Miller (Psychology)
Psychology | McAnulty College and Graduate School of Liberal Arts | Junior
Faculty Advisor: Alex Kranjec, Ph.D.

ABSTRACT: Do people separate art from the artist? In the age of shifting social norms and intense fan tribalism, the question of whether an artist's character should influence our appreciation for their art has become a central question. However, studying this question empirically is difficult since an artwork typically reflects the character of the artist in some way. This research will therefore be conducted experimentally. Our goal is to to elicit a biased response from the participants after informing them about the artist's history.

The experiment begins with a short segment of an obscure instrumental song and participants will be asked to rate their enjoyment. One artist is tonally positive, while the other is tonally negative. Participants will then read a fictional background story which presents the artist in a positive or negative light. Afterwards, participants will repeat the process with a different song that same artist's discography. The same two song process is repeated for another artist, who will be depicted positively if the first artist was depicted negatively, or vice versa. The difference between the initial and secondary impressions will be used to interpret the individual's bias. The difference is then compared with results from other participants.

We expect that participants would be biased toward hating music more after believing the artist to be a heinous person. The discovery of how people's tastes in music are skewed based on their moral intuitions about the artists provides insight as to whether the art can truly be separated from the artist.

144: Breaking Down the Misinformation Surrounding Animal Testing

Saffrin Schaeffer

Political Science | McAnulty College and Graduate School of Liberal Arts | Sophomore
Faculty Advisor: James Talerico, Ph.D.

ABSTRACT: When most people hear the phrase “animal testing,” they visualize lipstick being placed on bunnies and dogs getting nail polish on their paws. Unfortunately, misinformation like this makes the reality of animal testing seem less cruel than it is. Animal testing is a form of experimentation that uses animals to gain results on how cosmetic products will affect humans. Most of the time, this experimentation involves injecting makeup product ingredients into the animals and placing chemicals into their eyes. Humane Society International approximates that 500,000 animals suffer and die each year from these cosmetic tests. If they are not killed from the testing, they often are euthanized once they are deemed useless. This poster presentation will explore the misinformation on the Internet regarding cosmetic animal testing. The makeup industry thrives on the lack of truthful information surrounding their practices and keep this harmful information out of the public eye. By examining statistics and authenticated accounts of animal cruelty, while breaking down the deceptive information, we can begin to see the truth of this problem and be better prepared to combat it. . This poster will showcase the false information regarding abuse and create a new conversation on how society can move away from cosmetic testing on animals. By exposing the makeup industry for their use and abuse of animals, we can work towards the betterment of society and the eradication of animal testing.

145: Novel Flow Chamber Design for Photoacoustic Flow Cytometry (PAFC)

Jennifer Schinke Sakina Goawala

Biomedical Engineering / Applied Mathematics | Rangos School of Health Sciences, McAnulty College and Graduate School of Liberal Arts, Biomedical Engineering | Senior
Faculty Advisor: John Viator, Ph.D.

ABSTRACT: Photoacoustic flow cytometry is a newly developed optical method for the detection of pathologic analytes such as cancerous and bacterial cell lines. This process is completed using a flow chamber that contains the sample as well as the optical fiber that delivers 532nm laser pulses for absorption in the targeted cells. The current flow chamber model necessary for this process can be unreliable due to the quartz tubing that is used as the flow channel. It often breaks when removing air bubbles from the chamber prior to testing by accidental bumping due to its delicateness and can only be tested with minimal times before breaking naturally. An updated flow chamber model has been created using polydimethylsiloxane (PDMS) to fill the chamber and create a hollow channel using piano wire. Using PDMS is beneficial because it is acoustically matched to enable robust detection. This channel is unbreakable leading to a more reliable chamber that can withstand many more uses than the prior model. The new flow chamber eliminates the delicate aspect of the prior model and thus saves time, money, and resources.

146: Educational Theory: A Support for Students Suffering from Pandemic-Related Mental Health Concerns (Virtual Participation Only)

Alexa Orbin

Secondary Education/English Dual Degree | School of Education/McAnulty College and Graduate School of Liberal Arts | Senior

Faculty Advisor: Sarah Wright, Ph.D.

ABSTRACT: Research has shown a direct correlation between the Covid-19 pandemic and a recent rise in mental health issues in high school students. I have spent time during the 2021-2022 school year in high school classrooms observing the alarming increase in mental health concerns amongst high schoolers. Students have returned to the traditional in-person learning setting reporting struggles with anxiety, depression, and grief because of the pandemic (Pew Charitable Trust). Several adolescent physiological associations have declared a national emergency as mental health in high school students declines (Pew Charitable Trust). This project proposes a solution for high school teachers looking to motivate and support students in their classrooms. Specifically, I argue that Abraham Maslow's hierarchy of need, Howard Gardner's theory of multiple intelligences and Lev Vygotsky's social learning theory offer educational theories that can effectively combat mental health issues caused by pandemic-related stressors. These theories offer means by which to address: the decline in student motivation due to online learning, lower expectations, and lighter workload; lack of sleep due to worry, stress, and depression (reported by 1 in 4 surveyed high school students [Margolius]); and lack of confidence and esteem related to the Covid-19 pandemic. Research also shows that pandemic-related stress has disproportionately impacted people of color (Margolius). Conversations with high school professionals and observations of high school students support this research.

References:

Covid Harmed Kids' Mental Health-and Schools Are Feeling It." COVID Harmed Kids' Mental Health-And Schools Are Feeling It | The Pew Charitable Trusts, <https://www.pewtrusts.org/en/research-and-analysis/blogs/stateline/2021/11/08/covid-harmed-kids-mental-health-and-schools-are-feeling-it>.

Margolius, Max, et al. "The State of Young People during COVID-19: Findings from a Nationally Representative Survey of High School Youth." America's Promise Alliance, America's Promise Alliance, 1 June 2020. EBSCOhost, search-ebsohost-com.authenticate.library.duq.edu/login.aspx?direct=true&db=eric&AN=ED606305&site=eds-live&scope=site

LIST OF PARTICIPANTS BY SCHOOL

Last, First – Abstract Number

*Indicates oral presenter

Video - indicates Creative Video Competition

Bayer School of Natural and Environmental Sciences

Adamik, Hailey - 25
Aymar, Paige - 6
Baxter, Dylan - 126
Bayto, Mikayla - 104
Bell, Natalie - 51
Bennett, Marissa - 110
Beres, Danielle - 47
Boyer, Aiden - 92
Cawley, Hannah - 21
Conklin, Shane - 106
Costa, Suzannah - 108
Dangel, Lauren - 105
de Jesús, Fabiola - 15
DelPrince, Amber - 82
DiFrank, Ann - 77
Diltz, Elizabeth - 88
Duda, Alexis - 124
Esenwein, Raegen - 89*
Farmen, Christopher - 31
Filipkowski, Julia - 72
Firek, Julianna - 131
Fromuth, Daniel - 73
Fu, Jiahao - 35
Gibbs, William - 43
Gibson, Julia - 57
Grisanti, Parker - 121
Haberstock, Isabella - 101
Hajihassani, Arian - 19
Hamilton, Jenna - 97
Henry, Samiya - 1
Karl, Alexys - 50
Katsafanas, Jacob - 70
Kern, Kamber - 68
Kmidowski, Shelby - 59
Marini, Ashton - 95
Massari, Kayla - 26
Maus, Abigail - 34
McClure, Taylor - 34

McIntyre, Clancy - 27
McNamee, Abigail - 8
Mellott, Madison - 41
Michaels, Alexa - 54
Mitta, Priyanka - 16
Moskal, Lindsay - 123
Muccio, Grace - 16
Mulreany, Jenna - 128
Nguyen, Savannah - 14
Nguyen, Huong - 76
Oblak, Evan - 56
O'Neill, Devin - 66
Pastierik, Remy - 39
Patel, Pratham - 39
Patton, Emma - 28
Picariello, Maeve - 33
Potock, Matt - 18
Price, Olivia - 0
Rebel, Lauren - 79
Schaeffer, Hannah - 55
Seuferer, Nicole - 122
Sobol, Erika - 52
Souriyavong, Melanie - 15
Stockmal, Grace - 113
Stone, Megan - 34
Sullivan, Marie - 29*
Supinski, Alexandra - 74
Thompson, Jessica - 37
Treece, Megan - 46
Tressler, Serina - 4
Turnacioglu, Lauren - 119
Tuzzo, Alexa - 23
Uhrin, Madison - 125
Valenty, Hannah - 48
Vause, Will - 120
Villarey, Danna - 103
Wagner, Wesley - 100

Mary Pappert School of Music

Cortney, Gordon - 67

Dell, Megan - 15
Kessler, Adrian - 93
Souriyavong, Melanie - 15

**McAnulty College and Graduate
School of Liberal Arts**

Acharya, Avishek - 86
Aroesty, Hannah - 139
Battista, Antonio - 65
Cabacungan, Renne - 53
Cortney, Gordon - 67
Courtney, Anna - 139
Cromer, Isabelle - 61
Davis, Brandan - 140
de Jesús, Fabiola - 15
Dell, Megan - 15
DiBenedetti, Cassie - 58
Ehrlichman, Rachel - 109
Farbo, Mackenzie - 91*
Goawala, Sakina - 0
Jaronski, Simon - 71
Kessler, Adrian - 93
Kolson, Amanda - 10
Krishna, Diya - 44
Lee, Jonah - 117
Manfre, Joe - 22
Miller, Daniel - 143
Minicozzi, Jason - 11*
Moskal, Lindsay - 0
Orbin, Alexa - 146
Oroho, Haley - 111
Paul, Jennifer - 36
Rafi, Tariq - 143
Reese, Kalyann - 36
Reith, Carley - 0
Reith, Abigail - 7
Rosello, Kate - 58
Schaeffer, Saffrin - 144
Scheetz, Alex - 38
Schinke, Jennifer - 145
Souriyavong, Melanie - 15
Spratt, Savannah - 116
Stoll, Seth - 91*
Stone, Megan - 34
Strimling, Julia - 49
Voytek, Mara - 36
Weber, Julia - 38

Wessel, Lauren - 139

Rangos School of Health Sciences

Ambrosino, Alexa - 12, Video
Badr, Durwash - 24
Baxter, Anna - 5
Becker, Catherine - 12
Becker, Catherine - Video
Biancone, Bella - Video
Bohatch, Nicole - 62*
Braum, Sara - 30
Braum, Sara - Video
Caputo, Jordyn - Video
Carbino, Burton - 138, 24, 141
Cartwright, Alivia - 99, Video
Crawford, Micaela - 30
Crawford, Micaela - Video
Dean, Amanda - 132
Dean, Amanda - Video
DeStefano, Rachel - 30
Dowell, Rachel - Video
Downs, Julie - 12
Downs, Julie - Video
El-Hajj, Elyssa - 141
Falasco, Claire - Video
Ferris, Ian - 134*, 87
Gambacorta, Celia - 60
Glaneman, Erica - 17*
Gouker, Raegen - 141
Guy, Alexander - 133
Hall, Emily - 132
Hansen, Morgan - 30
Hebenton, Abby - 60
Hepner, Gram - 90
Hernandez, Selvin - 134*
Hernjak, Carlie - 135
Herstek, Ethan - 135
Houseworth, Jordan - 135
Janov, Katherine - 127
Joyce, Kaitlyn - 30
Kazimer, Benjamin - 136, 83
Kikani, Anusha - 51
Knight, Tesla - Video
Kraeuter, Kayla - 138
Kupetz, Hannah - 107
Lewis, Adam - 80
Martino, Elena - Video
McCollum, Isabella - 24

McCreary, Shannon - Video
Meier, Emily - 60
Miller, William – 134*, 141
Musich, Karlie - Video
Nafziger, Melissa - Video
Nestler, Matthew - 85, 136
Pacheco, Mariana - 127
Pegg, Carissa - Video
Price, Olivia - 75, 64
Primm, Claire - 2
Refosco, Sarah - Video
Reith, Abigail - 7
Saldj, Kiearra - 20*
Schinke, Jennifer - 145
Schultz, Melanie - 81
Secaida Del Cid, Lucia - 80
Seidel, Lindsay – 17*, Video
Shaffer, Nicholas - 134*
Shepherd, Kathleen - Video
Shirmer, Rachel - Video
Skomo, Alec - 136
Sripathi, Bhoomika - 63
St. Clair, Christina - 136, 45
Stollberg, Mina - Video
Throop, Alexis - 62*
Tommer, Melanie - 98
Towns, Jessica – 20*, 135
Ulrich, Caitlin - 132
Van Aken, Mikayla - Video
Wehner, Jonathan - 134*
Wentz, Rachel - 60
Yurick, Brooke - 94

School of Education

Byers, Lauren - 64
Feschuk, Angel-Inez - 142*
Marasovich, Giannah - 112
Orbin, Alexa - 146
Quinlan, Ellie - 102

School of Nursing

Currie, Lindsay - 114
DeFabbo, Isabella - 96
DeRienzo, Marissa - 69, 78
Dunn, Kathleen - 118
Ferris, Ian - 134, 87
Gambacorta, Celia - 60

Gorog, Amber - 118
Greenan, Sara - 96
Hill, Meredith - 40*
Johnston, Madeline - 114
Marlett, Mary - 13*
Pappalardo, Rachel - 96
Peters, Alexis - 130
Scassa, Cassidy - 13*
Shields, Aidan - 130
Wentz, Rachel - 60
Werderber, Marlana - 114
White, Adrienne - 118
Wray, Alexis - 130

School of Pharmacy

Carbino, Burton - 138, 24, 141
Dobbins, Duncan - 42
Dobbins, Duncan - Video
Grenell, Katelyn - 9
Lombardo, Sylvia - 129
Meyers, Rebekah - 84*
Tran, Emily - 115

