



The OFFICE of UNDERGRADUATE
RESEARCH *presents the 4th annual*

2023

**Undergraduate
Research
Conference**

MARCH 31 2023



MISSISSIPPI UNIVERSITY
for **WOMEN**



FROM THE COORDINATOR

I am so proud to announce the 4th annual campus-wide Undergraduate Research Conference this year. We have come a long way in 4 short years, from having a traditional, in-person conference, to taking the best of both situations and creating a live-streamed, recorded, and hybrid conference. Accessibility is a foundational principle of the OUR, and so we bring that value to all facets of the undergraduate research, even down to the formats in which students can share their work.

We would not have as much access to as many resources without the financial, intellectual, and physical support from several campus offices. First, I would like to thank the members of the Undergraduate Research Advisory Committee for their involvement in continually improving and revising the efforts toward this conference. I would also like to thank Fant Memorial Library staff and faculty, particularly Victoria Williams and Kelsey Damms, who have been instrumental in acquiring materials, navigating campus policies, and communicating our efforts across campus. So much of the planning for one day has been months in the making.



The mission of The W's Office of Undergraduate Research is to promote and celebrate undergraduate research, empower students to engage in original intellectual or creative work across the curriculum, and collaborate with faculty, staff, and community partners to create and sustain research opportunities.

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Special Thanks

Undergraduate Research
Advisory Committee

Fant Memorial Library
Faculty and Staff

President Nora Miller

Dr. Scott Tollison and the
Office of the Provost

Office of Development and
Alumni

MUW Alumni Association

MUW Student Life

Student and Faculty
Volunteers

I also would like to thank Dean Amanda Powers and Dr. Scott Tollison, both of whom have invested in the OUR's endeavors through their financial and intellectual support. Thanks also to the Office of Development and Alumni, the MUW Foundation, and the Alumni Association for valuing the impact that Undergraduate Research has on the student experience.

A big thank you to the faculty volunteers who have agreed to dedicate their Friday afternoon to engaging their students in scholarly conversations, and to the student volunteers who have contributed their free time for the sake of supporting their peers. Most importantly, thank you to the students who are sharing the fruits of their labor with us here today. They are the reason we do what we do! I look forward to your presentations, to engaging with you in multiple modalities, and to learn from your past, current, and future pursuits.

Hillary A. H. Richardson

Coordinator of Undergraduate Research and
Information Literacy



Undergraduate Research Conference March 31, 2023

All panel presentations will be in Fant Library's Tiered Classroom and live-streamed from the AthenaCommons conference page: athenacommons.muw.edu/urc

COFFEE WITH SCHOLARS AND REGISTRATION

9:30 - 10:30 am Alumni and students to share coffee and conversation. Volunteers and participants may check in and retrieve conference materials at the registration table. Library Lobby

OPENING REMARKS

10:30 am AthenaCommons Tiered Classroom

Hillary Richardson - Welcome

Victoria Choate, MUW Class of 2021 - Kickoff Keynote

STUDENT PRESENTATIONS

10:45 am POSTERS Athena Commons South Hallway, Fant Library

Irelyn French - Investigating Historical Psychological Instruments on Campus: Mirror Tracing Apparatus

Ayooluwa Ilesanmi - Computational Evaluation of Bioactive Compounds from *Vaccinium vitis-idaea* L (Ligonberry) for Treating KRAS-associated Lung Cancer

Reggi Pech - What Makes a Good Product?

Aubrey Parker - Sexual Knowledge and Wellness of College Students

Jadelynn Rudolf - Phage Peptide Technology to Characterize Extracellular Vesicles in the Brain Tumors

Maggie Taylor - Triazole compounds: Potentials in the treatment of cystic fibrosis



Undergraduate Research Conference March 31, 2023

All panel presentations will be in Fant Library's Tiered Classroom and live-streamed via Zoom from the AthenaCommons conference page: athenacommons.muw.edu/urc

1:00 pm	SOCIAL SCIENCES PANEL I: BEHAVIORS AND NEUROSCIENCE* Shameria Thompson - Misinformation Tera Dora - Perceived Racism and Help Seeking Behaviors on College Campuses Annie Hollis - Antagonistic Pleiotropy in Alzheimer's Disease	Athena Commons Tiered Classroom
2:00 pm	SOCIAL SCIENCES PANEL II - REPRODUCTIVE HEALTH Hailey Reel - The Downfall of Women's Reproductive Health Hailey McCool - Reproductive Health in America: A History of Patriarchal Control	Athena Commons Tiered Classroom
3:00 pm	VOLUNTEER AND STUDENT PARTICIPANT RECEPTION For student presenters, faculty evaluators, and student volunteers	Multipurpose Room
3:30 - 4:00 pm	CLOSING REMARKS AND AWARDS ANNOUNCEMENT Hillary Richardson - Introductions Dr. Scott Tollison, VPAA - Award Announcements Best Oral Presentation Best Poster Best Long-term Research Best Short-term Research Best Overall Presentation	Athena Commons Tiered Classroom

*Presentations in this panel are asynchronous



UNDERGRADUATE RESEARCH CONFERENCE

GET INVOLVED IN UNDERGRADUATE RESEARCH

HANDS-ON EXPERIENCES

Find conferences, internships, publications, and campus research opportunities in your major! These opportunities can offer experiences (and sometimes pay) that will give you hands-on research experience.

Visit muw.edu/our/opportunities for more.

SUMMER SCHOLARS

Get course credit and a scholarship for tuition, room, and board to do faculty-mentored research over the summer. Applications are reviewed throughout the spring semester.

Visit muw.edu/our/summer for information on the program and application deadlines.

FUNDING

The OUR lists on-campus programs that offer funding for student research. Apply for a \$500 award toward a project, conduct research through Federal Work-Study, or apply for a summer fellowship

Visit muw.edu/our/funding for details.



STUDENT ABSTRACTS

Tera Dora

Perceived Racism and Help Seeking Behaviors on College Campuses

This goal of this study is to measure if and how perceived racism on college campus affects mental health help seeking behaviors of students. The goal is to examine racism in asynchronous courses as well as synchronous online and face-to-face courses across primarily white and historically black colleges and universities. The proposed study will include assessment of perceived racism, help seeking attitudes, and intent to seek help among students at six universities in the state of Mississippi. Implications would be to open disclosure on micro- affirmation/ micro- inclusions in college courses regardless of course delivery method to improve the well being of all college students regardless of race or ethnicity.

Irelyn French


Investigating Historical Psychological Instruments on Campus: Mirror Tracing Apparatus

In the holdings of the Department of Psychology and Family Science at Mississippi University for Women there are about 15 psychological machines and instruments. I have been investigating these machines and instruments as part of a research project on the history of the department and psychological measurement because current faculty are unsure what most of them are. I utilized several resources to identify each instrument and its purpose (e.g., psychology museum archives and YouTube). One interesting find was the equipment for the Mirror-Tracing Task. This apparatus has been used in research on hand-eye coordination and motor skills. The next step is to determine how these machines can be used in classes today to help students learn more about psychology.

Annie Hollis

Antagonistic Pleiotropy in Alzheimer's Disease

Apolipoprotein E (APOE) $\epsilon 4$ allele has been linked with Alzheimer's disease; specifically having two copies of the APOE $\epsilon 4$ allele greatly increases the risk of developing Alzheimer's disease in older age. Studies have attempted to relate an antagonistic pleiotropy hypothesis to this gene, i.e., the $\epsilon 4$ allele has positive effects on cognition and memory in early life and negative effects later in life. Many of these studies have had several limitations and conflicting results, such as testing adults in upper middle age or comparing the absence of the $\epsilon 4$ allele with the presence of at least one $\epsilon 4$ allele. Studies showed that having two copies of the $\epsilon 4$ allele has the highest risk of developing Alzheimer's in older age, comparing the presence of one $\epsilon 4$ versus none skews the results. (Abstract continued on next page)



Testing older adults does not allow for proper conclusions about the antagonistic pleiotropy hypothesis. The objective of this study is to determine if the APOE ϵ 4 allele has an effect on cognition and memory before the onset of Alzheimer's when compared to other variants of the APOE gene. We will use reliable methods to test attention, memory, and executive function in all variants of the APOE gene (ϵ 2 ϵ 2, ϵ 3 ϵ 3, ϵ 3 ϵ 4, and ϵ 4 ϵ 4) in healthy adults with an age range of 18-30. The results of this study will offer a better understanding of the progression of Alzheimer's disease and allow for more in-depth studies on progression with two copies of the APOE ϵ 4 allele.

Ayooluwa Ilesanmi

Computational Evaluation of Bioactive Compounds from *Vaccinium vitis-idaea* L (Ligoberry) for Treating KRAS-associated Lung Cancer

Lung cancer is the cancer of the lung's epithelial cells typically characterized by difficult breathing, chest pain, blood-stained coughs, headache, and weight loss. If left unmanaged, lung cancer can spread to other body parts. While several treatment methods exist for managing lung cancer, exploring natural plant sources for developing therapeutics offers great potential in complementing different treatment approaches. In this study, we concentrated on inhibiting the mutated Kirsten rat sarcoma viral oncogene homolog (KRAS) by targeting an associated protein (Phosphodiesterase 6 δ) to which KRAS form complexes. We evaluated bioactive compounds from Ligoberry (*Vaccinium vitis-idaea* L), adopting computational approaches such as molecular docking, molecular dynamics simulation, molecular mechanics/generalized Born surface area (MM/GBSA) calculations, and pharmacokinetics analysis. A total of 26 out of 39 bioactive compounds of *Vaccinium vitis-idaea* L had a higher binding affinity to the target receptor than the approved drug, Sotorasib. Further, the pharmacokinetics properties of the lead compounds were examined, and the best four compounds, namely, (+) – Catechin (Cianidanol), Arbutin, Resveratrol, and Sinapic acid, were further subjected to molecular dynamic simulation. In conclusion, Arbutin (+) – Catechin and Sinapic acid are predicted to be the best compound of *Vaccinium vitis-idaea* L, because of their pharmacokinetic properties and drug-likeness attributes. Also, their stability to the target receptor makes them a potential drug candidate that could be explored for treating KRAS-mutation-associated lung cancer.



Hailey McCool

Reproductive Health in America: A History of Patriarchal Control

The United States is often referred to as the land of opportunity and the home of the free, yet today, those who challenge the patriarchal system are not treated fairly or equitably. Historically, from owning land to voting women have fought for the same rights enjoyed by men. The effort of early feminist movements paved the way for the Supreme Court to protect women's reproductive rights through *Roe v. Wade*. For decades, women were able to make a choice regarding their reproductive health. However, in just the past year (2022), the Supreme Court ruled to strike down *Roe v. Wade*, thus undoing years of work and the liberty of women to decide on their own health care. While some people associate *Roe v. Wade* with abortion and pro-life and pro-choice, this view discounts the fundamental right to access contraceptives and resources all women need to make informed decisions about their reproductive health. In a country where women are so desired, their rights mean so little to the men who seek to promote gender roles that ignore the fundamental values Americans have enjoyed for centuries: the freedom to pursue happiness. The consequences of the overturning of *Roe v. Wade* can restrict access to birth control for minority women and teenagers, restrict resources for domestic violence victims, and create additional burdens on society when individuals are not ready or equipped to form families.

Aubrey Parker

Sexual Knowledge and Wellness of College Students

The purpose of this research project is to conduct further research on the use of a questionnaire developed by the fall 2022 FSC 330 class to assess sexual health knowledge of W students. I plan to study their use as a potential educational tool to provide sexual health knowledge to W students in addition to assessing their sexual health knowledge. The revised survey consists of topics that cover: contraceptives, women's/ men's sexual health and anatomy, gender/ sexual orientation, sexual coercion, STI's, and lastly love/ communication. The survey we are currently making will have three different versions that are: feedback on incorrectly answered questions, feedback on correctly/ incorrectly answered questions, and no feedback. This is to test if feedback will improve test scores. To start the experiment, I will give the participants access to versions where feedback is given. Three weeks after the surveys are finished, I will release the final version with no feedback to evaluate the knowledge of the explanations that were given. The hypothesis is those given the most information will perform better on a post- test of sexual health knowledge. Through the survey that FSC 330 produced, we found that W students knew more than the typical American. Students performed best on the sexual coercion subscale and showed poorest performance on the gender and sexual orientation subscale. The mean score of these participants was a 67%, which is passing, however it indicates that the W students still have much to learn about sex, and healthy sex habits.



Reggi Pech

What makes a good product?

My research for the summer of 2022 was on product design. As a graphic designer product design has always interested me but I was only aware of the technical aspect of it. Through the research I immersed myself in the process of product design from beginning to end. My goal for the entirety of the research was to design a real product and to explore the importance of functionality and aesthetics. The early stages of the project was all research as I read *The Design of Everyday Things* by Don Norman and *An Industrial Design Guide* by Carmen Andrisani and Neville Songwe. Next, I rendered a design based on what I learned. Afterwards, I started construction on the product which perhaps taught me more on product design than the preliminary research. Finally, I focused on presentation and graphic design. My entire process is to be presented on a poster that summarizes my research and will inform the viewer on what makes a good product.

Hailey Reel

The Downfall of Women's Reproductive Health


Women, they are known as mothers, caretakers, lovers, sisters, and wives. They are applauded for raising obedient children and making sure their family is well taken care of, but who takes care of women?

Women over the centuries have had little to no rights. From the denial of voting rights, land ownership, and even educational opportunities, women have sought for their voices to be heard and their choices to be recognized. Today, women in the United States have been silenced and their choice stripped away by the overturning of *Roe V. Wade*, one of the biggest victories for women's rights and a historical milestone for women's reproductive health. The ramifications of inadequate reproductive health can be difference between life and death among women of color as they have one of the highest pregnancy mortality rates within the United States. This paper discusses how the overturning of *Roe V. Wade* disproportionately affects marginalized and victimized women through gender roles within families and society.

Jadelynn Rudolf

Phage Peptide Technology to Characterize Extracellular Vesicles in the Brain Tumors

Extracellular vesicles (EV) are lipid-bound containers derived from the endosomal membrane network or from the extracellular membrane of cells. They can carry proteins, lipids, miRNAs, and other molecules, and may be involved in intercellular communication via membrane-associated proteins. Glioblastomas (GBM) are aggressive cancers of the brain and spinal cord derived from astrocytes. Extracellular vesicles derived from glioblastomas can make their way through the blood brain barrier and find their way to different bodily fluids, and so could serve as biomarkers for this cancer. We have isolated phage-display peptides from a commercial library of random phage-displayed peptides that will bind glioblastoma extracellular vesicles (GBM-EVs). (Abstract continued on next page)



We compared dose-response ELISA quantification of phage-display peptides bound to extracellular vesicles from glioblastomas to phage-mediated real-time immuno-PCR. Real-time immuno-PCR is a powerful technique that combines ELISA with the specificity and sensitivity of PCR. Both techniques had a hard time distinguishing GBM-EV-binding phage from control phage, but preliminary results indicated that real-time immuno-PCR had a higher sensitivity at low concentrations.

Shameria Thompson

Misinformation

The goal of this study is to research, to watch how misinformation plays a role in our community and world today. We put out misinformation in the public about a hero or savior type story and a suspect and victim story. What we did was put the misinformation out into the world via twitter and when we did it, we made screenshots and waited for reactions. When we posted it, we made updates and acted as if it was being reported live and in the moment. Thought in the end we made changes to the original tweets about how the original suspect was actually not the color or maybe even the gender that was told to the public and they actually had the story wrong the suspect was now the victim and victim the suspect. We did this to get the publics first reaction to the crime, the race or the person, and recorded the publics original perspective of it.

Maggie Taylor

Triazole compounds – Potentials in the treatment of cystic fibrosis

Cystic Fibrosis (CF) is a genetic disease that affects the respiratory and digestive system and is most common among Caucasians of Northern European origin. CF is caused by mutations in a membrane protein CFTR (Cystic Fibrosis Transmembrane-conductance Regulator). This mutation impairs the membrane protein's chloride ion channel function. One of the most common CFTR mutations is the DF508 mutation that affects over 70% of CF cases. Our research has shown that the DF508-CFTR mutation can be partially reversed by physical and chemical means [Heda & Marino, BBRC, 271:659-664, 2000]. In cell lines expressing DF508-CFTR, synthetic anion carriers have shown to augment the chloride ion channel function (Yang et al. J. Biol. Chem., 1278(37) : 35079-35085, 2003). In this study, we use triazole compounds, synthesized in Talukdar lab (IISER, Pune, India), to determine their effects on DF508-CFTR upregulation. These compounds are known for their ability to bind and facilitate chloride influx to cultured cell lines. Methods: Human lung epithelial cell lines (CFBE) transfected with DF508-CFTR were cultured and treated with various concentrations of triazole compounds (ABS-089, PJ-08) at 27 degrees for 60 hours. Cell lysates were then prepared and immunoblotted with anti-CFTR antibody and CFTR-specific signal was detected by chemiluminescence using c300 image analyzer (Azure Biosystems). Results: Both tested compounds showed an increase in the CFTR band-B when compared to the vehicle alone. Conclusion: Our research suggests triazole compounds could potentially be used as therapeutic agents for Cystic Fibrosis treatment.



UNDERGRADUATE RESEARCH CONFERENCE

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Questions or comments?

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