



**WAYNE STATE  
UNIVERSITY**  
Undergraduate Research  
Opportunities Program

**2024 WARRIOR SCHOLARS:  
THE WAYNE STATE UNIVERSITY  
CONFERENCE FOR  
UNDERGRADUATE RESEARCH  
AND CREATIVE WORK**



## ◆ ACADEMY OF SCHOLARS

The WSU Academy of Scholars was founded in 1979 to promote and recognize sustained excellence in scholarship and creative achievement. The academy provides support to promising young scholars and periodically hosts special programming for the campus community. Election to the Academy of Scholars is the highest recognition that may be bestowed upon a Wayne State University faculty member by his or her colleagues. Membership in the academy is for life.

The Undergraduate Research Opportunities Program (UROP) thanks the Academy of Scholars for their annual participation in the Warrior Scholars Conference. In addition to judging the presentations they also provide numerous awards for those they deem the best.

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## ◆ PROGRAM

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- **Friday, March 29, 2024, Student Center Building**

- 8:00 A.M.      **Registration** —  
2nd floor of the Student Center Building outside of the Ballroom
- 9:00 A.M.      **Poster Session**  
Ballroom
- 10:30 A.M.     **Break**
- 10:45 A.M.     **Oral Session**—  
Hilberry A,B, C, D, E, F, and room 285
- 11:45 A.M.     **Break**
- 12:00 P.M.     **Luncheon and Awards Ceremony** —  
Ballroom

### **Greetings:**

#### **Darin Ellis**

Associate Provost for Academic Programs and Associate Vice President for Institutional Effectiveness

#### **Laurie Lauzon Clabo**

Provost and Sr. Vice President for Academic Affairs

### **Award Ceremony:**

#### *Greeting*

#### **Matthew Orr**

Undergraduate Research Opportunities Program Coordinator

#### *Presentation of the Information Literacy Award*

#### **Paul Bracke**

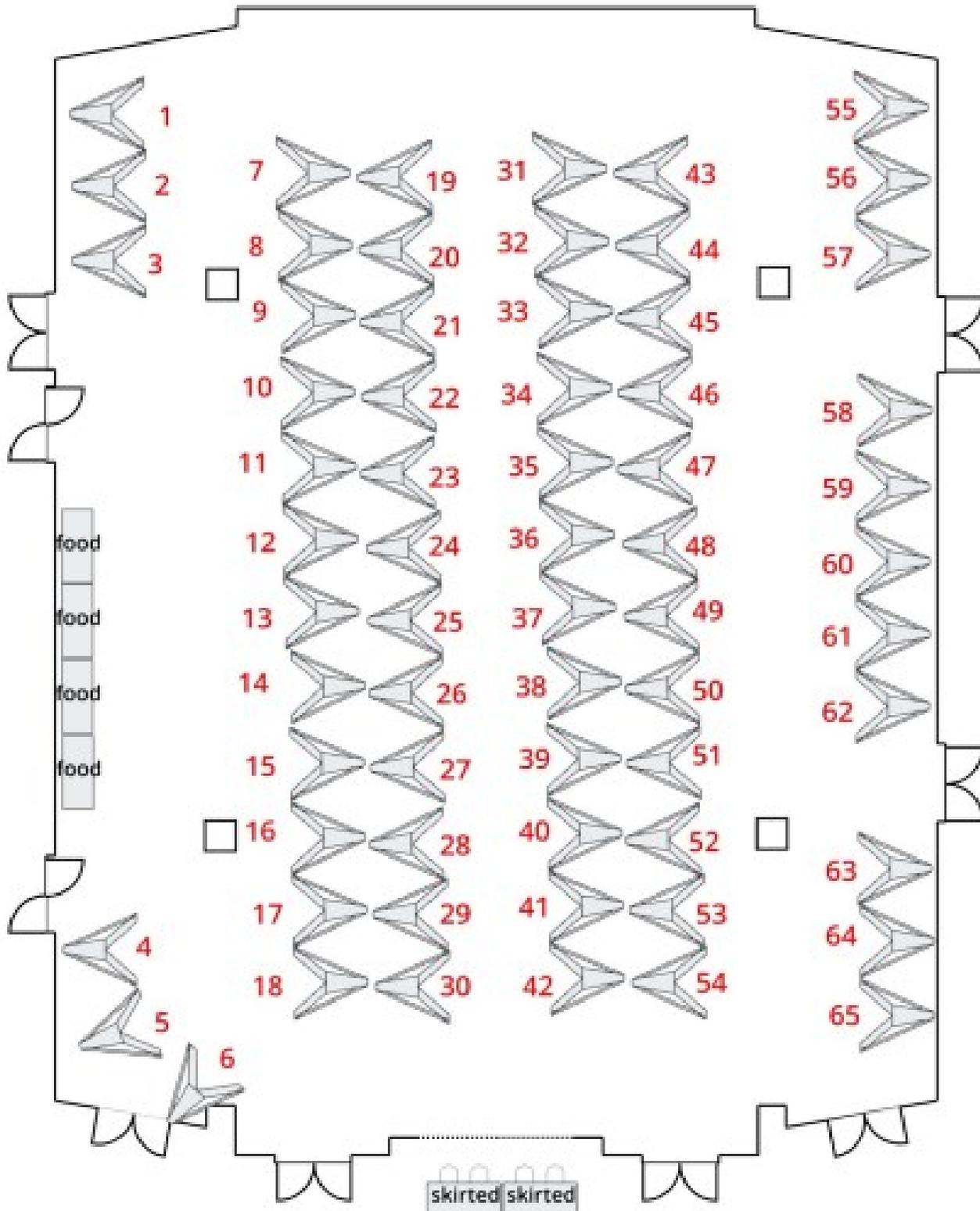
Dean of the Library System

#### *Presentation of the Academy of Scholars Awards for Best Presentations*

#### **Mary T. Rodgers**

Professor of Chemistry and Wayne State University Academy of Scholars Member

◆ POSTER DISPLAY MAP



**Student Center Building**  
Ballroom

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**◆ POSTER SESSION****9:00 AM—10:30 AM**

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- **Marco Cardamone | Poster 1**

*The Development and Evolution of Urban Sprawl in Metro Detroit*

- **Joseph Cook | Poster 2**

*How To Wave: Design; Sociability in Urban Environments*

- **Michelle Durham | Poster 3**

*Clay and the Inner Child: An Interactive Experience*

- **Alex Klaus | Poster 4**

*Abolition and Black Settlement in the Rural Midwest*

- **Melak Salim | Poster 5**

*Environmental Justice for Palestine: How the War is Impacting Gaza's Environmental Health*

- **Musammat Islam | Poster 6**

*Arab American Identity on Depression and Anxiety*

*Through Experience of Racism*

- **Clare Barrette | Poster 7**

*The Impact of Caregiver Emotion Regulation on the Relationship between Adolescent Emotion Regulation and Posttraumatic Stress Symptoms among Violence-Exposed Youth*

- **Morgan Burt | Poster 8**

*Not Just "Pronoun People"*

- **Fareeha Chaudhry | Poster 9**

*Review of the Efficacy Study Deficit in Anxiety Aid-Claiming Mobile Applications*

- **Aniketh Datta | Poster 10**

*The Ins and Outs of Recruitment for Clinical Drug Trials*

- **Veronica Fahmi | Poster 11**

*The Perception of Pain with IUD Insertion: A Potential Barrier to IUD Utilization*

- **Nour Ghosn | Poster 12**

*Parental Knowledge about Adolescent Peer Victimization: Effects on Youth Anxiety*

- **Dillon L. Glenn | Poster 13**

*Incentives and Attrition in a Web-Based Intervention for Smoking Cessation*

- **Nina Goodwin | Poster 14**

*Is There a Threshold on Loyalty? How Cost at Checkout Can Affect the Acquisition of a Loyalty Account*

- **Trevor Greene | Poster 15**

*Interactive HPV Vaccination Education Program (IHVEP) for HPV-Related Cancer Patients*

- **Taybah Hashmi | Poster 16**

*Neuropsychological and Epistemic Justification for Inclusivity and Knowledge Production*

- **Jenna Hijawi | Poster 17**

*How Maternal Depressive Symptoms Impact Infant/Child Development amongst Immigrant and Refugee Arab*

*American Families*

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**◆ POSTER SESSION****9:00 AM—10:30 AM**

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- **Maria Ignacio-Santilla | Poster 18**

*Functional Aging; Mindfulness for Seniors Through Inter-generational Events: A Pilot Study*

- **Alexander Jakubiec | Poster 19**

*Exploring the Impact of Air Pollution on Youth Anxiety and Brain Connectivity through Personal Air Monitoring*

- **Waris Khan | Poster 20**

*Cannabidiol (CBD) Long-Term effect on the Myelin sheath of Neonatal Rats treated with CBD*

- **Hajir Lafta | Poster 21**

*Going Slow to Go Fast: A Case Study of Deploying Enhanced Replicating Effective Programs (REP) for Systematic Adaptation of an Evidence-Based Prevention Curriculum*

- **Yusra Mahmood | Poster 22**

*The Effect of Social Media Usage and Violence Exposure on Mental Health Outcomes among Adolescents*

- **Natalia Shakouri | Poster 23**

*Exploring the Prevalence, Patterns, and Perceptions of Prenatal CBD Usage among Pregnant Women in Metropolitan Detroit*

- **Adura Sogbesan | Poster 24**

*Department Utilization Moderates the Relationship Between Heroin Use-Related Consequences and Opioid Treatment Seeking*

- **Marcus Akrawi | Poster 25**

*Detecting Cancer Cells Based on Stiffness Measured by Atomic Force Microscopy and Brillouin Microscopy*

- **Hesham Aldhaibani | Poster 26**

*Utilizing Acoustic Sensors for the Assessment of Behind Armor Blunt Trauma Injury using Animal Models*

- **Jacob Eickhoff | Poster 27**

*Generation of GAG-Chitosan Capsules Through the Electrospray Method*

- **David Pogosian | Poster 28**

*Parallel Algorithm for Maximum Matching in Bipartite Graphs*

- **Abe Raychouni | Poster 29**

*Optimizing 3D-Printed Designs to Create Hollow Fibers for Use in Tissue Engineering*

- **Sidharth Veluthakkal | Poster 30**

*Imaging-Guided Automatic Cell Alignment for Brillouin Flow Cytometry*

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**◆ POSTER SESSION****9:00 AM—10:30 AM**

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- **Marko Vucelic | Poster 31**

*Investigating Gene Expression of Inflammatory Markers in the Adventitia as Potential Indicators of Early-Stage Diabetic Vasculopathy in a Tissue Engineered Model*

- **Lin Rayes | Poster 32**

*Dopamine-Derived Toxins May Cause Parkinson's Disease*

- **Bassil Adam | Poster 33**

*Targeted Remodeling of the Extracellular Matrix with a Branched Peptide PD-1 Agonist as Immunotherapy for Type 1 Diabetes (T1D)*

- **Hasnat Ahmed | Poster 34**

*Nutrient Stress Drives Sequestration of SAM Synthases in *Saccharomyces Cerevisiae**

- **Hajir Alobaidi | Poster 35**

*Spatial and Temporal pH Variation in Rainwater at Detroit's Urban Farms*

- **Ahlam Awada | Poster 36**

*From Transcription to Translation: Introns Enhance Gene Expression at Multiple Steps*

- **Dhruval Bhatt | Poster 37**

*Disordered Brain Network Dynamics In Schizophrenia Investigated Using Graph Theory, Clustering and Estimated Entropy*

- **Deidre Crockett | Poster 38**

*Modulation of NO/cGMP Signaling in Sickle Red Blood Cells (RBCs) to Reveal Novel Mechanisms Mediating RBC-Endothelial Interactions*

- **Amal Elsaleh | Poster 39**

*Synthesis and Biological Approaches of Caged Sugars to Regulate Protein Modifications*

- **Jason Fahmy | Poster 40**

*CRISPR Analysis of Obesity-related Cancer Proteins in a Model of Food Desert Populations*

- **Hira Farooq | Poster 41**

*Development of a Covalent Peptide Inhibitor of VISTA Using Sulfonyl Fluoride Exchange (SuFEx)*

- **Mehrnaz Ghafouri | Poster 42**

*Inhibitors of Histone Deacetylase and MCL-1 Synergistically Reduce Proliferation in Malignant Melanoma*

- **Bintulhuda Hadi | Poster 43**

*Fungistatic and Fungicidal Effects of Oteseconazole (Otz) in Vaginal Simulant Media*

- **Dania Jabbar | Poster 44**

*Valproic Acid and Inositol Biosynthesis*

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**◆ POSTER SESSION****9:00 AM—10:30 AM**

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- **Shridula Kotakondla | Poster 45**

*Perceived Stress, Cholesterol, and Cognitive Decline: An Exploratory Mediation Analysis among Older African Americans in Metro-Detroit*

- **Kareem Krayem | Poster 46**

*Design and Synthesis of Linkers for Trivalent PROTAC*

- **Tetyana Kulish | Poster 47**

*The Impact of Mild Intermittent Hypoxia on Sleep and Neurocognitive Function in Those with Spinal Cord Injury*

- **Ava Mac | Poster 48**

*Exploring Withdrawal Effects of a Novel Benzofuran Derivative in a Rodent Model: A Behavioral Analysis*

- **Noor Mian | Poster 49**

*Novel Histone Synthesis Targeting Through H4 Antagonist as a Therapy Against Triple-Negative Breast Cancer and Disease Recurrence*

- **Ryan Mirhosiny | Poster 50**

*Utilization of DNA-cloning and CRISPR-Cas9 Techniques to Investigate Programmed Cell Death in Response to Various Pathogens.*

- **Zachary Ott | Poster 51**

*High-Dose Immunoglobulin G Maintains Insulin Tolerance in Type 2 Diabetic Mice by Preserving Beta Cell Function and Mass*

- **Deep Patel | Poster 52**

*Effects of Transitioning from Morphine to Buprenorphine (Medication for Opioid Use Disorder) During Pregnancy on Maternal Care and Offspring Neurodevelopment in a Translational Rodent Model.*

- **Mary Saleem | Poster 53**

*Pipeline for Single-cell RNA Sequencing Data: Prospects for Investigating Ion Channels in the Pain Circuit*

- **Jacob Spaulding | Poster 54**

*Elevated Manganese in the Diet Affects the Lifespan of Adult Drosophila Expressing  $\alpha$ -Synuclein Mutant Proteins*

- **Alexandar Trendov | Poster 55**

*AAV-Mediated PLP Regulation in a Mouse Model of PMD*

- **Sergio Guerra | Poster 56**

*Effects of Extracellular Calcium on Levels of Glutathione in Extracellular Media of Cultured Hepatocytes*

- **Rae Hopp | Poster 57**

*A Recommendation to the Detroit Zoological Society for Mudpuppy (*Necturus maculosus*) Data Collection in Belle Isle, Detroit, Michigan*

- **Rebecca John | Poster 58**

*Determine the Binding and Dissociation Constant of TRI-OBP-4 to Actin Filament*

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◆ **POSTER SESSION**

**9:00 AM—10:30 AM**

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- **Mahmood Khattab | Poster 59**

*Photoinduced Reduction of Arenes by SmII Based Amino-Alcohol Systems*

- **Matthew Maliskey | Poster 60**

*Applications of Thermally Controlled Release of Inhalable Nitric Oxide Releasing Materials*

- **Dia Rahman | Poster 61**

*Synthesizing Ancillary Ligands to Form Tetradentate Complexes with Ruthenium (II)*

- **Neal Slabbekoorn | Poster 62**

*GE2/1 Mapping Project*

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♦ **ORAL SESSION** **10:45 AM-11:45 AM**

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• **Hilberry A Panel Presentation**

**Mark Grove II, Keaton Windhurst, Charlee LeCrone, David Abdelnour, and Keegan Pulford-Thorpe** — *Strong Hand, Strong Body? Using Handgrip Strength to Assess Health and Performance*

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• **Hilberry B**

**Zainab Alhussainy** — *The 1991 Iraqi Uprising- Al-Intifadhah AlShaabaniyah*

**Regina Cabrera Hernandez** — *Analyzing the Electoral Systems of Croatia; Bosnia and Herzegovina*

**Nicolas Reina** — *Democracy in Fundamentally Fractured Societies*

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• **Hilberry C**

**Finnley Culhane** — *Investigating Modern Indigenous Reconciliation Efforts*

**Haley Puri** — *Queer Soundscape*

**Sara Trost** — *Gender in a Genderless language: is there Bias in Gender Assignment?*

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• **Hilberry D**

**Gregory Lomason** — *Enhancing Personalized Fitness Programs Through Specialized GPTs*

**Syed Raza** — *Lottery Manager vs. Gambler in Crisis: A Game-Theoretic Approach*

**Mohammad Saqallah** — *Curvature Dependent Binding of Proteins to Lipid Droplets of Varying Size*

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• **Hilberry E**

**Lane Belden, Bex Watson** — *Claiming the People's Home: Competing uses of Folkhemmet in Sweden's Radical Right*

*and Center Left*

**Klaus Friedrich** — *Parasocial Interaction and Politics for Young Adults*

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♦ **ORAL SESSION**

**10:45 AM—11:45 AM**

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- **Hilberry F**

**Cassidy Conley** — *Riding the Zoomers Entrepreneurial Wave: How Gen Z Responds to Their Autonomy Anxiety in Traditional Workforce Dynamics*

**Clara Keller** — *Student's Access and Agency: How are College Students Taking Control of Their Own Sex Life?*

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- **Room 285**

**Tarek Atasi** — *Ubiquitin-Protein Ligase Parkin in Methamphetamine Use Disorder*

**Archana Matheswaran** — *Characterization and Optimization of Disulfiram as an Antifungal Agent*

**Simisolaoluwa Olabode** — *Reducing the Risk of Maternal Morbidity and Mortality for Underserved Women*

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## ◆ PRESENTERS

- **Bassil Adam** | Faculty Mentor - Andrew Lipchik

*“Targeted Remodeling of the Extracellular Matrix with a Branched Peptide PD-1 Agonist as Immunotherapy for Type 1 Diabetes (T1D)”*

Type 1 Diabetes (T1D) results from an immune cell attack on insulin-producing beta cells, causing loss of glucose homeostasis. PD-1 is an immune checkpoint protein present on T-cells. When PD-1 binds to its ligand, PDL-1, inhibition of the immune system occurs. We aim to develop a branched peptide agonist of PD-1 that selectively resides on the extracellular matrix of the beta cells as a proof-of-concept therapy for T1D. We hypothesize that our approach will prevent T cell-dependent beta cell death.

- **Hasnat Ahmed** | Faculty Mentor - Hanna Hariri

*“Nutrient Stress Drives Sequestration of SAM Synthases in Saccharomyces Cerevisiae”*

S-adenosylmethionine (SAM) synthases are enzymes that play an important role in many cellular processes. The goal of this project is to understand how the supramolecular organization of SAM synthases contributes to their function in cells. The enzymatic assemblies that SAM synthases form can be tracked using high-resolution imaging and classical biochemistry techniques. Studying the formation of these foci can help us understand the underlying mechanisms of regulation of essential biochemical pathways.

- **Marcus Akrawi** | Faculty Mentor - Jitao Zhang

*“Detecting Cancer Cells Based on Stiffness Measured by Atomic Force Microscopy and Brillouin Microscopy”*

Detecting Cancer Cells Based on Stiffness Measured by Atomic Force Microscopy and Brillouin Microscopy  
Student Researcher: Marcus Akrawi Faculty Mentor: Jitao Zhang  
Cancer metastasis is the breaking away of cancer cells from the original tumor, traveling through circulatory and lymphatic systems to form new tumors elsewhere in the body. Atomic Force Microscopy is the set gold standard of measurement of the stiffness of biological samples at high resolution. Brillouin Microscopy is a new, noninvasive method of measurement of the mechanical properties of cancer cells and their benign counterparts. Using both methods, we can gain a better understanding of metastatic potential.

- **Hesham Aldhaibani** | Faculty Mentor - Cameron Dale Bass

*“Utilizing Acoustic Sensors for the Assessment of Behind Armor Blunt Trauma Injury using Animal Models”*

While body armors can be very useful at saving lives, they can cause a great damage to the person's organs. Body damage that can result from body armors is referred to as Behind Armor Blunt Trauma. In which they don't penetrate the body, but they cause bone fractures, organ damage, and internal bleeding on extreme cases. This study aims at providing an easier way to detect bone fracture during armor testing using animal models and human cadavers.

## ◆ PRESENTERS

- **Zainab Alhussainy** | Faculty Mentor - Nadejda Marinova

*“The 1991 Iraqi Uprising- Al-Intifadhah AlShaabaniyah”*

This thesis explores the 1991 uprising in Iraq, a rebellion against Saddam Hussein's dictatorship. Through interviews with Iraqi Americans in Michigan, the project examines the causes and experiences of the uprising. The research sheds light on the courage of ordinary people who resisted oppression.

- **Hajir Alobaidi** | Faculty Mentor - Glen Hood

*“Spatial and Temporal pH Variation in Rainwater at Detroit's Urban Farms”*

Urban farming in Detroit has expanded access to fresh produce for residents living in low-income neighborhoods. Detroit struggles with on-going air pollution through rainwater, increasing the risk of high metal intake for consumers of urban produce. Our objective was to characterize spatial and temporal differences of rainwater across Detroit. We collected rain samples from urban farms after each rain event and measured pH to observe fluctuations in pH across 5 different regions of Detroit.

- **Tarek Atasi** | Faculty Mentor - Anna Moszczynska

*“Ubiquitin-Protein Ligase Parkin in Methamphetamine Use Disorder”*

Our previous study demonstrated that overexpression of a ubiquitin-protein ligase parkin in the nucleus accumbens decreased methamphetamine intake and relapse to methamphetamine-seeking behavior in rat model of heavy methamphetamine use. The goal of the current study was to elucidate molecular pathways underlying the anti-addictive properties of parkin using a rat model of self-administration.

- **Ahlam Awada** | Faculty Mentor - Athar Ansari

*“From Transcription to Translation: Introns Enhance Gene Expression at Multiple Steps”*

Introns significantly influence gene expression from transcription to translation. Our research delves into the introns' impact on yeast genes ASC1 and APE2, revealing their vital role in cellular fitness and gene expression stages. Intron-lacking versions of both genes exhibited 30-60% slower growth, compromised performance on ethanol and glycerol media, and increased R-loop signals. In addition, there was a decrease in transcription levels and mRNA half-lives.

## ◆ PRESENTERS

- **Clare Barrette** | Faculty Mentor - Valerie Simon

*“The Impact of Caregiver Emotion Regulation on the Relationship between Adolescent Emotion Regulation and Posttraumatic Stress Symptoms among Violence-Exposed Youth”*

Many adolescents with histories of interpersonal violence exposure experience posttraumatic stress symptoms (PTSS). Higher levels of adolescent rumination (AR) predict subsequent PTSS (Moulds et al., 2020). Co-rumination between caregivers and adolescents also negatively affects adolescents’ mental health (Felix et al., 2020). This study looks at how caregivers’ use of rumination (CR) as an emotion regulation strategy impacts adolescent PTSS, which is important for optimizing family-based treatments for adolescents’ PTSS.

- **Lane Belden, Bex Watson** | Faculty Mentor - Kevin Deegan-Krause

*“Claiming the People’s Home: Competing uses of Folkhemmet in Sweden’s Radical Right and Center Left”*

In this project, we analyzed the usage of the Swedish term "Folkhemmet" ("the people's home") within the Swedish parliament from its introduction in 1928 up until the present day. We created a timeline illustrating how the term has been used by different parties, oftentimes with different goals, and put forward the argument that shared themes of nationalism and economic equality unite these usages.

- **Dhruval Bhatt** | Faculty Mentor - Vaibhav Diwadkar

*“Disordered Brain Network Dynamics In Schizophrenia Investigated Using Graph Theory, Clustering And Estimated Entropy”*

Exploring brain network dynamics in schizophrenia, we propose a novel framework to analyze centrality dynamics during learning tasks. Using functional MRI, we investigate how these dynamics correlate with brain activity and symptoms. Our study aims to elucidate how disruptions in brain networks contribute to the complexity of schizophrenia.

- **Morgan Burt** | Faculty Mentor - David Merolla

*“Not Just “Pronoun People”*

The increased visibility of transgender and gender non-conforming (TGNC) people in the last several decades has led to new problems within the workplace. Misgendering is a common microaggression that TGNC people face, and it can lead to substantial mental health consequences. While there have been many self-reported surveys on the subject, this project aims to understand its effects through experimental means along with gaining an understanding of misgendering's effects on cisgender individuals.

## ◆ PRESENTERS

- **Regina Cabrera Hernandez** | Faculty Mentor - Kevin Deegan- Krause

*“Analyzing the Electoral Systems of Croatia & Bosnia and Herzegovina”*

This project presents a comparative study on the creation and development of the electoral systems of Croatia & Bosnia and Herzegovina. It includes an overview of the development of each electoral system, focusing on political actors, electoral reforms, and their effects on the system itself. The goal of this project was to better understand the factors that influenced the differences between these two electoral systems and their impact on democracy.

- **Marco Cardamone** | Faculty Mentor - Kidada Williams

*“The Development and Evolution of Urban Sprawl in Metro Detroit”*

This project analyzes how the process of urban sprawl unfolded and continues today in Metropolitan Detroit. The result of sprawl is negative health consequences, a degraded environment, particularly associated with socioeconomic status. Despite common assumptions and misconceptions, white flight continues in the region today with the expansion of the peripheral municipalities. This trend is explicitly tied to housing discrimination and segregation policies enacted by the local, state, and federal government.

- **Fareeha Chaudhry** | Faculty Mentor - Aaron Martin

*“Review of the Efficacy Study Deficit in Anxiety Aid-Claiming Mobile Applications”*

Anxiety-aid mobile applications are ever-growing in the landscape of digital mental health care, yet very few lack transparent studies that document their efficacy. This project looked into 60 anxiety-focused mobile apps available today to see if they had published efficacy studies that support their services tools and if that information was accessible to users. A random sample of 10 apps from that pool were analyzed further using the APA app evaluation model.

- **Cassidy Conley** | Faculty Mentor - James McQuaid

*“Riding the Zoomers Entrepreneurial Wave: How Gen Z Responds to Their Autonomy Anxiety in Traditional Workforce Dynamics”*

Dive into the world of Generation Z, the trendsetting Zoomers, as they break away from traditional work norms in search of independence and creative freedom. Through interviews and surveys, this research unveils their dissatisfaction with conventional jobs and their leap into freelancing and small business ventures. It's a journey of autonomy, innovation, and cultural identity, urging employers and policymakers to adapt or face the consequences of an evolving workforce landscape.

## ◆ PRESENTERS

- **Joseph Cook** | Faculty Mentor - Brian Kritzman

*“How To Wave: Design; Sociability in Urban Environments”*

The UN 2030 Agenda for Sustainable Development mentions, for the first time, the importance of creativity and cultural inclusion in economic and social progress. Reimagining the spaces that shape our interactions, HOWTOWAVE.CO approaches social pressures with industrial design principles. Through public seating and signage, this research looks at social engagement in urban environments as a direct result of design and placemaking.

- **Deidre Crockett** | Faculty Mentor - Jennell White

*“Modulation of NO/cGMP Signaling in Sickle Red Blood Cells (RBCs) to Reveal Novel Mechanisms Mediating RBC-Endothelial Interactions”*

In sickle cell disease, excessive adhesion of red blood cells to blood vessel walls leads to frequent pain episodes and organ damage. Hydroxyurea (HU) is the standard-of-care treatment, but its method of action is unconfirmed. HU reduces adhesion while increasing levels of nitric oxide (NO) and cyclic GMP (cGMP), offering clues into its specific function. This project discovers HU's effects on adhesion and NO-cGMP levels, uncovering ways to manage pain episodes in sickle cell patients.

- **Finnley Culhane** | Faculty Mentor - Karen Marrero

*“Investigating Modern Indigenous Reconciliation Efforts”*

This project investigates promised investigatory efforts outlined in varying news reports regarding the 2021 discovery of Indigenous bodies in Kamloops, British Columbia. It provides an in-depth comparative analysis of Canadian and American news coverage and aims to illuminate the differences between each respective nation's coverage. The purpose of this paper is to expose false promises and shed light on the ongoing effects of the former North American Residential School System.

- **Aniketh Datta** | Faculty Mentor - Tanja Jovanovic

*“The Ins and Outs of Recruitment for Clinical Drug Trials”*

Currently, there are limited pharmacological treatments for PTSD, presenting the need for randomized controlled drug trials (RCTs). Previous studies have shown that participant recruitment and retention are usually the hardest parts of these studies due to strict criteria that include or exclude potential participants. Here, I break down screening data from an RCT for PTSD to examine where and why potential participants are screened out, and if there are any biases in the study's criteria.

## ◆ PRESENTERS

- **Michelle Durham** | Faculty Mentor - Jessika Edgar

*“Clay and the Inner Child: An Interactive Experience”*

The responsibility of the artist is to create work that they find most inspiring to not only themselves, but the world around them. This creative project takes a look at the inner world through an interactive workshop designed for participants to connect with their inner child through the cathartic powers and somatic nature of clay. This workshop is an opportunity to explore the material, engage in free expression, and create a collaborative final installation.

- **Jacob Eickhoff** | Faculty Mentor - Howard Matthew

*“Generation of GAG-Chitosan Capsules Through the Electrospray Method”*

Research has expressed the need for the creation of artificial tissues. This study aims to further explore previous work done in the Matthew lab with a goal to generate vascularized artificial tissues. More specifically, generating a bed of hollow, spherical capsules that are capable of supporting cells inside, and using a 3d bioprinter to print structures that will serve as artificial blood vessels.

- **Amal Elsaleh** | Faculty Mentor - Charlie Fehl

*“Synthesis and Biological Approaches of Caged Sugars to Regulate Protein Modifications”*

This project aims to synthesize chemically activated cages (click cages) that can be attached and removed from our target molecule, GlcNAc, in order to control the rate of O-GlcNAcylation by regulating levels of GlcNAc that are present during studies. The synthesis of these cages will allow us to better understand the role that O-GlcNAcylation plays in these various disease states.

- **Veronica Fahmi** | Faculty Mentor - Rick Zimmerman

*“The Perception of Pain with IUD Insertion: A Potential Barrier to IUD Utilization”*

The intrauterine device (IUD) is a form of long-term contraception with benefits such as reversibility and effectiveness. The purpose of this research is to better understand the perception of pain with the insertion of an IUD and its impact on IUD use in young women. The researcher explored this by asking participants about demographics; sexual activity; contraceptive use; perceptions of barriers including perception of pain linked to IUD insertion; and other experiences with the IUD.

## ◆ PRESENTERS

- **Jason Fahmy** | Faculty Mentor - Charlie Fehl

*“CRISPR Analysis of Obesity-Related Cancer Proteins in a Model of Food Desert Populations”*

Cellular mechanisms explaining the increased incidence of obesity-related cancers in food desert populations are limited with current medicinal chemistry and molecular biology techniques. Our system utilizes CRISPR-based genomic engineering to tag proteins with chemical probes, allowing for data collection on a per-protein basis including localization, stability, and other chemical analyses in a cellular model of poor nutrition. Using this system, we can uncover cellular mechanisms explaining the increased incidence of obesity-related cancer in food deserts.

- **Hira Farooq** | Faculty Mentor - Andrew Lipchik

*“Development of a Covalent Peptide Inhibitor of VISTA using Sulfonyl Fluoride Exchange (SuFEx)”*

In the tumor microenvironment, VISTA, an immune checkpoint is overexpressed. This checkpoint interacts with PSGL-1 which negatively regulates the immune system. This interaction allows the tumor to continue to grow with minimal regulation. The goal of this project is to create a peptide, using the Liberty Blue peptide synthesizer, that disrupts the VISTA and PSGL-1 interaction in the tumor microenvironment. By disrupting this interaction we can likely successfully boost the immune response with minimal collateral damage to other cells.

- **Klaus Friedrich** | Faculty Mentor - Zachary Brewster

*“Parasocial Interaction and Politics for Young Adults”*

This qualitative sociological study utilizes semi-structured interviews with young adults to understand their experiences with social media, political media, political engagement, and parasocial interaction with politically leaning online content creators. Looking at these aspects, the study sought to understand how overt exposure to social media, and emotional connection to what occurred in digital spaces, has affected political perception and engagement for the first generation to grow up in the digital age.

- **Mehrnaz Ghafouri** | Faculty Mentor - Andrew Fribley

*“Inhibitors of Histone Deacetylase and MCL-1 Synergistically Reduce Proliferation in Malignant Melanoma”*

Melanoma is a skin cancer that arises in melanocytes; it is the fifth most common cancer in the United States, with approximately 100,000 new cases per year. Current treatments include surgical excision, radiation therapy, and systemic therapy; however, the five-year survival rate for patients with stage IV is 29.8%. To address this urgent unmet medical need, we treated a panel of cultured melanoma cell lines with the histone deacetylase inhibitor Panobinostat and the novel preclinical MCL-1 inhibitor AZD5991 to determine if they could synergistically inhibit growth.

## ◆ PRESENTERS

- **Nour Ghosn** | Faculty Mentor - Hannah Schacter

*“Parental Knowledge about Adolescent Peer Victimization: Effects on Youth Anxiety”*

Peer victimization can increase psychological problems (e.g., anxiety) for adolescents. With research showing a disparity in parental knowledge about their child’s peer victimization experiences, we asked parent-adolescent pairs in Metro-Detroit about such experiences through online surveys. By comparing parental and adolescent reports, the current study examined how adolescent-parent incongruence about peer victimization is related to adolescent-reported anxiety and whether a congruence in reports acted as a buffer against adolescent reported anxiety.

- **Dillon L Glenn** | Faculty Mentor - Seung Hee Choi

*“Incentives and Attrition in a Web-Based Intervention for Smoking Cessation”*

This presentation investigates how modifying the distribution of incentives impacts engagement and retention in a web-based smoking cessation intervention, WeQuit. The study aims to fill gaps in understanding of how various incentive distribution strategies can optimize user engagement and address attrition in eHealth interventions for smoker couples.

- **Nina Goodwin** | Faculty Mentor - Cassandra Davis

*“Is There a Threshold on Loyalty?: How Cost at Checkout Can Affect the Acquisition of a Loyalty Account”*

The project *Is There A Threshold on Loyalty?* targeted the gap of knowledge in consumer psychology between pricing and consumer loyalty through rewards systems. Using a retail-store simulation survey, customers spent a predetermined range within their fictional wallets and answered prompts from a cashier. Using this data, we can begin to interpret the relationship between the two variables: price and acquisition of a loyalty account.

- **Trevor Greene** | Faculty Mentor - Radhika Gogoi

*“Interactive HPV Vaccination Education Program (IHVEP) for HPV-Related Cancer Patients”*

HPV-related oropharyngeal cancers are on the rise. The HPV vaccine is highly effective in preventing this, yet vaccine uptake is low. Our research aims to raise vaccine confidence and intent to discuss vaccination among HPV-related cancer survivors through our novel educational intervention allowing patients to be the voice for vaccine education and advocacy. This strategy could be key in boosting HPV vaccination rates and eliminating these preventable cancers.

## ◆ PRESENTERS

- **Mark Grove II, Keaton Windhurst, Charlee LeCrone, David Abdelnour, Keegan Pulford-Thorpe** | Faculty Mentor - Tamara Hew-Butler

*“Strong Hand, Strong Body? Using Handgrip Strength to Assess Health and Performance”*

In this 3-part presentation, we explore the utility of using a quick and easy measure - handgrip strength - as a surrogate marker of metabolic, physical, and mental health in athletes and non-athletes. We then explore the possibility of using handgrip strength as a tool for assessing readiness and recovery in collegiate baseball pitchers. Our main findings suggest that a grip strength which exceeds body weight is an excellent marker of good overall physical health.

- **Sergio Guerra** | Faculty Mentor - Jeffrey Ram

*“Effects of Extracellular Calcium on Levels of Glutathione in Extracellular Media of Cultured Hepatocytes”*

Glutathione (GSH) is known to sensitize an extracellular sensor in the kidneys causing an increase in calcium concentration in the bloodstream. I hypothesize that the increased calcium in the blood will feed back to the liver and cause an increased release of glutathione and its derivatives (GSSG and CySSG). This study was conducted using cultured hepatocytes in varying levels of extracellular calcium that were assayed and read under a plate reader for results.

- **Bintulhuda Hadi** | Faculty Mentor - Robert Akins

*“Fungistatic and Fungicidal Effects of Oteseconazole (Otz) in Vaginal Simulant Media”*

Our study aims to optimize the use of fluconazole (Flz) and oteseconazole (Otz) for the topical treatment of vulvovaginal candidiasis, a fungal infection caused by *Candida* species. This project investigated the susceptibility of both Flz-resistant and Flz-susceptible strains of *C. glabrata* and *C. albicans* isolates RPMI- 1640 and vaginal-simulated media with differing pH levels. Through time-kill assays, plate-kill assays, and determination of minimum inhibitory concentration (MIC), fungal susceptibility was evaluated under varying pH conditions.

- **Taybah Hashmi** | Faculty Mentor - Layla Saatchi

*“Neuropsychological and Epistemic Justification for Inclusivity and Knowledge Production”*

Marginalized groups are set to the periphery of society because of the certain beliefs they hold, their race, gender, or socioeconomic background. However, society overlooks their diverse experiences and how they might aid in knowledge production, specifically in policy making. Using psychology, neuroscience, and philosophy, this paper justifies the importance of diverse viewpoints and how they could aid in policy-making.

## ◆ PRESENTERS

- **Jenna Hijawi** | Faculty Mentor - Dalia Khalil

*“How Maternal Depressive Symptoms Impact Infant/Child Development amongst Immigrant and Refugee Arab American Families”*

There is a gap in research when it comes to understanding the needs of Arab immigrants and refugees. The goal of this research is to identify how being an Arab American immigrant or refugee mother impacts the ways in which maternal depression progresses and impacts infant/child development. The knowledge gained in this study is valuable to highlight and bridge the gap that is present in healthcare in regards to this demographic.

- **Rae Hopp** | Faculty Mentor - Donna Kashian

*“A Recommendation to the Detroit Zoological Society for Mudpuppy (Necturus maculosus) Data Collection in Belle Isle, Detroit, Michigan”*

This project outlines the longstanding research the Detroit Zoological Study is conducting on Belle Isle, attempting to monitor the Mudpuppy population. It examines flaws in their data set and provides a recommendation to improve data collection and analysis. The goal of this project is to give the Detroit Zoological Society a literature reviewed method that is simple and consistent with their goals.

- **Maria Ignacio-Santillan** | Faculty Mentor - Ignacio-Santillan

*“Functional Aging; Mindfulness for Seniors Through Intergenerational Events: A Pilot Study”*

This research aims to understand the impact of intergenerational activities on physical and mental health. It compares engagement levels between aging adults and youth in physical activity and healthy eating sessions. Observations indicate a higher interaction and mood in physical activity session between both groups. The findings contribute to understanding effective strategies for promoting health-related behaviors across generations to enhance overall quality of life.

- **Musammatt Islam** | Faculty Mentor - Ty Partridge

*“Arab American Identity on Depression and Anxiety Through Experience of Racism”*

This project examined the relationship between between the Arab American identity and depression and anxiety.

## ◆ PRESENTERS

- **Dania Jabbar** | Faculty Mentor - Miriam Greenberg

*“Valproic acid and Inositol biosynthesis”*

Valproic acid (VPA) is a mood stabilizer treatment that's been used in the treatment of bipolar disorder—a psychiatric disorder characterized by changes in mood and energy levels. VPA has been shown to deplete inositol levels, however the mechanism by which it does this has not yet been elucidated. Current work is aimed to understand this mechanism in the cell using yeast in hopes of developing better drugs for the management of BD in the future.

- **Alexander Jakubiec** | Faculty Mentor - Hilary Marusak

*“Exploring the Impact of Air Pollution on Youth Anxiety and Brain Connectivity through Personal Air Monitoring”*

Despite the known link between air pollution (PM2.5) exposure and risk of anxiety in youth, the neurobehavioral mechanisms are poorly understood. In this study, Metro-Detroit youth wore personal air monitors, completed anxiety questionnaires, and underwent brain imaging. No significant association between PM2.5 and anxiety was observed. PM2.5 was associated with altered functioning connectivity within the salience network, a brain network implicated in anxiety disorders and is involved in attention orienting to emotional stimuli.

- **Rebecca John** | Faculty Mentor - Takeshi Sakamoto

*“Determine the binding and dissociation constant of TRIOBP-4 to actin filament”*

This goal of this research project is to determine the binding and dissociation constants of TRIOBP-4 to actin filament. This was measured using stopped-flowmetry which measures protein-protein interactions.

- **Clara Keller** | Faculty Mentor - Simone Chess and Lauren Duquette-Rury

*“Student’s Access and Agency: How are College Students Taking Control of Their Own Sex Life?”*

This capstone thesis centers around the polarizing opinions and controversial ideologies that reproductive health faces today. By focusing on universities in the U.S. This research uncovers how the climate around sexual health has affected college student's access to contraceptive resources, as well as the relationship between student organizers and university administration. I hope to use my thesis to increase awareness of sexual health and emphasize the importance of having access to adequate healthcare.

## ◆ PRESENTERS

- **Waris Khan** | Faculty Mentor - Susanne Brummelte

*“Cannabidiol (CBD) Long-Term effect on the Myelin sheath of Neonatal Rats treated with CBD”*

My project looked at how the effects of Cannabidiol (CBD) can reduce the potential effects of neurological diseases in neonatal rats. The rats were meant as a model for infants born in the NICU (Neonatal Intensive Care Unit), who undergo painful procedures that are shown to produce an increase in neurological diseases and impaired development.

- **Mahmood Khattab** | Faculty Mentor - Matthew Allen

*“Photoinduced Reduction of Arenes by SmII Based Amino Alcohol Systems”*

Divalent lanthanides (LnII) exhibit intriguing electrochemical and luminescence properties, which are valuable in organic synthesis and catalysis. Tuning these properties for specific applications involves modifying ligand donor atoms coordinated to LnII. SmI<sub>2</sub> has been shown to be a powerful reducing agent, yet it is limited in reducing substrates like benzene. We propose a SmII system with a coordinating macrocyclic ligand for benzene reduction, leveraging tertiary amines and pendant alcohol arms for enhanced reactivity and photo-induced excited states.

- **Alex Klaus** | Faculty Mentor - Kidada Williams

*“Abolition and Black Settlement in the Rural Midwest”*

White-led abolitionist movements are often viewed with little nuance, failing to acknowledge how this history impacted the lives of Black settlers after the Civil War. This project looks at abolitionist movements and post-Civil War Black settlement in three rural midwest communities in Michigan and Illinois to better understand how these movements operated, what they revealed about white abolitionist thought, and how it impacted Black settlement after the Civil War.

- **Shridula Kotakondla** | Faculty Mentor - Samuele Zilioli

*“Perceived Stress, Cholesterol, and Cognitive Decline: An Exploratory Mediation Analysis among Older African Americans in Metro-Detroit”*

Stress is known to be a factor underlying many mental and physical health outcomes. Using data from The Heart of Detroit Study, this study investigated whether low-density lipoprotein cholesterol would mediate the association between perceived stress and subjective cognitive decline among older African American adults. Findings suggest that although cholesterol was not a significant mediator, future studies can examine other biological markers and cognitive measures as potential intermediate pathways linking stress to healthy aging.

## ◆ PRESENTERS

- **Kareem Krayem** | Faculty Mentor - Sheryl Roberts

*“Design and Synthesis of Linkers for Trivalent PROTACs”*

Proteolysis Targeting Chimeras (PROTACs) are molecules that could transform cancer treatment by selectively degrading targeted proteins. This project focuses on evaluating a trivalent PROTAC designed to target and degrade prostate cancer (PCa) cells. The molecule combines an E3 ligand, fibroblast activation protein inhibitor (FAPi), and 89Zr-chelator, aiming to demonstrate the molecule's diagnostic ability to target FAP using PET imaging. This approach potentially offers a new treatment for PCa and enables real-time visualization of protein degradation.

- **Tetyana Kulish**

| Faculty Mentor - Gino Panza

*“The Impact of Mild Intermittent Hypoxia on Sleep and Neurocognitive Function in Those with Spinal Cord Injury”*

Our study explores the impact of a novel therapy called mild intermittent hypoxia (MIH) on neurocognitive and sleep function for individuals with chronic spinal cord injury (SCI). MIH was delivered each morning over 8 days. Preliminary results show improvements in cognitive performance, sleep, and metabolic health, suggesting MIH could offer a beneficial intervention for those living with SCI.

- **Hajir Lafta** | Faculty Mentor - Andria Eisman

*“Going Slow to Go Fast: A Case Study of Deploying Enhanced Replicating Effective Programs (REP) for Systematic Adaptation of an Evidence-Based Prevention Curriculum”*

One of the main causes of substance use disorders in youth is early exposure to adversities such as death, divorce, and abuse. Schools are a central setting for interventions to reduce the impact of risk exposure on youth well-being. In order to make the existing school evidence-based intervention called the Michigan Model for Health more effective, we implemented trauma-sensitive systematic adaptations to the curriculum. We then measured whether substance abuse decreased in the student population.

- **Gregory Lomason** | Faculty Mentor - Patrick Mason

*“Enhancing Personalized Fitness Programs Through Specialized GPTs”*

This study proposes to explore the integration of artificial intelligence (AI) and exercise science to bring novel technologies and techniques to personalized fitness programs. By developing a specialized Generative Pre-trained Transformer (GPT) system, the project aims to automate and personalize fitness programming within the fitness industry and at Wayne State University. The study seeks to address the lack of unified systems efficiently integrating AI with individual health metrics, preferences, and progress tracking into personalized training programs.

## ◆ PRESENTERS

- **Ava Mac** | Faculty Mentor - Shane A. Perrine

*“Exploring Withdrawal Effects of a Novel Benzofuran Derivative in a Rodent Model: A Behavioral Analysis”*

MDMA has been used to treat PTSD but has negative effects after administration like anxiety and anhedonia that limit therapeutic use. Newly developed compounds similar to MDMA may provide more optimal treatments, but it is unknown whether they induce the same adverse effects. This study aimed to characterize the withdrawal effects of one of these new compounds, 5-MAPB, in male and female rats, using sucrose preference testing to measure their anhedonia before and after administration.

- **Yusra Mahmood** | Faculty Mentor - Tanja Jovanovic

*“The Effect of Social Media Usage and Violence Exposure on Mental Health Outcomes among Adolescents”*

Social media usage by adolescents has become prevalent over the years, raising concerns regarding its impact on mental health. This study investigates adolescent social media usage and how their usage patterns relate to their mental well-being, including the risk of depression, anxiety, and PTSD. Data from the Critical Periods Study of The Detroit Trauma Project along with a survey designed specifically to investigate social media usage was used as a basis for this study.

- **Matthew Maliskey** | Faculty Mentor - James Bour

*“Applications of Thermally Controlled Release of Inhalable Nitric Oxide Releasing Materials”*

Nitric oxide is a promising therapeutic that can fight against various cardiovascular/respiratory infections. NO releasing motifs have significant medicinal applications, and it can be directly administered into a patient via molecular drugs, an implantable device, or directly inhaled (iNO). However, modern NO as an inhalable treatment burdens a variety of complications, for instance, cost, accessibility, and toxicity. Therefore, developing new NO releasing materials offers an alternative to modern iNO treatments.

- **Archana Matheswaran** | Faculty Mentor - Robert Atkins

*“Characterization and Optimization of Disulfiram as an Antifungal Agent”*

Infections caused by *Candida* species are becoming increasingly problematic because of high rates of resistance to standard antifungals. Disulfiram as a drug is approved as a deterrent for alcohol abuse, and this study is testing whether Disulfiram can be repurposed as an antifungal agent. Further testing includes finding synergistic compounds to improve kill percentages. This project may lead to much needed alternative therapies for vaginal candidiasis and systematic fungal infections.

## ◆ PRESENTERS

- **Abe Raychouni** | Faculty Mentor - Howard Matthew

*“Optimizing 3D-Printed Designs to Create Hollow Fibers for Use in Tissue Engineering”*

There is a great incentive to conduct more research on organ tissue vascularization due to the high amounts of people on organ transplant waiting lists. When the biomaterials chitosan and Glycosaminoglycans react they form hollow fibers. The goal of my research is to test what different manufacturing parameters have on the fibers.

- **Lin Rayes, Ali Rashid** | Faculty Mentor - David Njus

*“Dopamine-Derived Toxins May Cause Parkinson's Disease”*

Parkinson's disease (PD) is a movement disorder that results from the selective death of dopaminergic neurons of the substantia nigra. We are testing the hypothesis that dopaminergic neurons are specifically vulnerable in this disorder because dopamine oxidizes to yield toxic products such as DHBT-1 and co-toxin BT-2. BT-2 specifically potentiates the toxicity of mitochondrial complex 1 inhibitors. DHBT-1 can further oxidize into DHBT-1 quinone amine that reacts with cysteine residues in proteins causing neurotoxicity.

- **Syed Raza** | Faculty Mentor - Fernando Charro

*“Lottery Manager vs. Gambler in Crisis: A Game-Theoretic Approach”*

Game theory is the mathematical study of rational decision-making in social interactions. In game theory, the players' perceptions of risk and return are the main driving forces. It is well known in psychology that stress can induce riskier behaviors like gambling. Studies have revealed that in an economic crisis, there was an increase in lottery participation, especially from lower socioeconomic populations. Our research uses game theory to model lottery participation during an economic crisis.

- **Nicolas Reina** | Faculty Mentor - Brad Roth

*“Democracy in Fundamentally Fractured Societies”*

This project begins with analysis of democracy's theoretical framework for the purpose of understanding better the failure of democratic institutions in socially fractured societies such as Bosnia and Northern Ireland. After making an argument for understanding democracy as a set of normative principles rather than mere institutions, the errors of enforced democracy become apparent.

## ◆ PRESENTERS

- **Mary Saleem** | Faculty Mentor - Alexander Gow

*“Pipeline for Single-cell RNA Sequencing Data: Prospects for Investigating Ion Channels in the Pain Circuit”*

Our project aims to develop and validate a software pipeline for gene expression analysis. We have developed a reliable method to examine gene expression data by combining literature review and experimental studies. We have confirmed the accuracy of our pipeline by using known genes as a benchmark. This pipeline will facilitate our future studies into gene expression patterns, in particular to identify ion channels in pain circuits.

- **Melak Salim** | Faculty Mentor - Zach Morales

*“Environmental Justice for Palestine: How the War is Impacting Gaza’s Environmental Health”*

The literature review on the impact of war on Palestine's environment highlights the imbalance caused by the displacement of civilians and its critical implications for health. Challenges include access to clean water, food, and polluted air. The research focuses on warfare's short- and long-term effects on the community and geography. It aims to provide insight into the environment and investigate the harmful impacts of warfare on the ecosystem and its inhabitants.

- **Mohammad Saqallah** | Faculty Mentor - Christopher V. Kelly

*“Curvature Dependent Binding of Proteins to Lipid Droplets of Varying Size”*

Proteins are responsible for many fat cells' storage, transport, and metabolism. How they select these fat cells remains unknown. We aimed to determine whether fat cell size, composition, and defects influence protein binding. Lab-made artificial fat cells (lipid droplets) were exposed to proteins, then adhered to a glass dish. Through fluorescence microscopy and custom-made imaging software, we were able to determine protein density on different-sized lipid droplets. Data indicating a preference for smaller-sized droplets. Understanding these binding preferences reveals fat cell construction and breakdown mechanisms, leading to advancements in combating obesity and related metabolic disorders.

- **Natalia Shakouri** | Faculty Mentor - Hilary Marusak

*“Exploring the Prevalence, Patterns, and Perceptions of Prenatal CBD Usage among Pregnant Women in Metropolitan Detroit”*

Our project investigates the prevalence, patterns, and perceptions of CBD use among pregnant women in metropolitan Detroit. We aim to understand the factors influencing CBD use during pregnancy and its potential impact on maternal and fetal health. By collecting data through a comprehensive survey, we seek to inform evidence-based guidelines and interventions, promoting the well-being of both mothers and their children.

## ◆ PRESENTERS

- **Noor Mian** | Faculty Mentor - Andrew Lipchik

*“Novel Histone Synthesis Targeting through H4 Antagonist as a Therapy Against Triple-Negative Breast Cancer and Disease Recurrence”*

Current chemotherapy treatments face high levels of toxicity and limited target specificity, urging the exploration of new cancer therapies and targets. One promising novel approach is targeting histone production. Histone protein synthesis is highly conservative and is crucial for cell division. We aim to develop a drug that mimics histone protein H4, inhibiting cancer cell proliferation without DNA damage or cytotoxicity. This approach could offer decreased toxicity, improved efficiency, and target specificity compared to current cancer treatment options.

- **Ryan Mirhosiny** | Faculty Mentor - Pei-Chung Lee

*“Utilization of DNA-Cloning and CRISPR-Cas9 Techniques to Investigate Programmed Cell Death in Response to Various Pathogens”*

The goal of my project is to investigate how cells defend against harmful bacteria through programmed cell death, specifically pyroptosis. To study the decision-making process of cells in response to different pathogens, genetic tools are constructed using DNA-cloning techniques. By editing genes to remove key proteins like GSDME and caspase-8, we aim to discover how these cells tailor their response. Understanding these mechanisms may lead to an enhanced therapeutic strategy against bacterial infections.

- **Simisolaoluwa Olabode** | Faculty Mentor - Lana Grasser

*“Reducing the Risk of Maternal Morbidity and Mortality for Underserved Women”*

Maternal morbidity and mortality have been increasing in the United States. In addition, there has been discrepancies in maternal health outcomes for women of color, low-income women, veterans, and those in rural environments. I propose the passing of the Black Maternal Health Momnibus Act, which is a multi-agency effort in improving maternal health outcomes in the United States. It includes 13 individual bills.

- **Zachary Ott** | Faculty Mentor - Andrew Lipchik

*“High-Dose Immunoglobulin G Maintains Insulin Tolerance in Type 2 Diabetic Mice by Preserving Beta Cell Function and Mass”*

Type 2 Diabetes is a chronic disorder characterized by insensitivity to insulin, which causes high blood sugar. Beta cells in the pancreas initially compensate by producing more insulin, but this response causes the exhaustion and eventual death of these cells. While current treatments do not directly address beta cell preservation, Ott presents a new therapeutic for preserving long-term beta cell survival and function, offering potential for preventing the progression of Type 2 Diabetes.

## ◆ PRESENTERS

- **Deep Patel** | Faculty Mentor - Susanne Brummelte

*“Effects of Transitioning from Morphine to Buprenorphine (Medication for Opioid Use Disorder) During Pregnancy on Maternal Care and Offspring Neurodevelopment in a Translational Rodent Model”*

We utilized a translational rodent model to investigate the effect of transitioning from morphine to BUP during pregnancy on maternal care and offspring neurodevelopment. Female rats were randomly assigned to one of five experimental groups: Vehicle (VEH), BUP continuous (BC), morphine continuous (MC), morphine to BUP (MB), or morphine to vehicle (MV). Maternal care behaviors were observed, and offspring mortality and neurodevelopment were recorded. Dams and litters were sacrificed at the end of the Project.

- **David Pogosian** | Faculty Mentor - Daniel Grosu

*“Parallel Algorithm for Maximum Matching in Bipartite Graphs”*

Imagine you're the village matchmaker with a group of eligible boys and girls ready for marriage. However, you can't pair them off arbitrarily because each individual has their own preferences (you don't want to create love triangles or cause drama!) So, how do you ensure everyone finds a suitable match and happiness prevails? The answer lies in employing a robust parallel matching algorithm, the focus of this project.

- **Haley Puri** | Faculty Mentor - Laura Foxman

*“Queer Soundscape”*

Queer Soundscapes explores the intersection of two contemporary art practices: Sound and Queer Art. Through examining queer modern poets, performers, and artists, Queer Soundscapes proposes the creation of a Queer Sound Archive to document this experience. This exploration centers a discussion around intersectionality emphasizing the importance of sensorial experience tied to queerness. Ultimately, it asks us to reexamine our spaces, and to advocate for queer identities through sound-based art practices on this campus.

- **Dia Rahman** | Faculty Mentor - Jeremy Kodanko

*“Synthesizing Ancillary Ligands to Form Tetradentate Complexes with Ruthenium (II)”*

Photochemotherapy harnesses light energy in order to release a compound from its binding to a metal. The compound can be designed to be a biologically active drug that can provide medicinal benefits when released. Ruthenium (II) can bind up to six compounds and the release of one could relieve strain present in the total complex. The goal is to use red light, which can penetrate tissue, in order to release drugs in a local area.

## ◆ PRESENTERS

- **Neal Slabbekoorn** | Faculty Mentor - Paul Karchin

*“GE2/1 Mapping Project”*

The GE2/1 sensor is a key component in the Compact Muon Solenoid (CMS) detector located at CERN. The CMS is a large particle detector designed to explore a wide range of particles produced in high energy collisions. The GE2/1 sensor is responsible for detecting muons, which are produced in the high-energy collisions and play a crucial role in the physics analyses performed at the CMS. In order to extract the physics information from the muon signals detected by the GE2/1 sensor, it is necessary to process the data in real time. This is accomplished through the use of VFAT’s. The VFAT’s used in the GE2/1 sensor are implemented using Very High-Speed Integrated Circuit Hardware Description Language (VHDL). Mapping the GE2/1 sensor's analog signals to VHDL code is a critical step in the design and implementation. This involves creating a mapping for the physical locations to the strips. The VHDL code is used to program them, which are integrated into the GE2/1 sensor.

- **Adura Sogbesan** | Faculty Mentor - Eric Woodcock

*“Emergency Department Utilization Moderates the Relationship Between Heroin Use-Related Consequences and Opioid Treatment Seeking”*

With the opioid epidemic costing over \$35 billion in healthcare and 350,000+ lives since 2017 in the USA, understanding treatment-seeking behaviors becomes crucial. This project focuses on opioid-related emergency department (ORED) visits among heroin users. Analyzing data from current heroin users, the study reveals that ORED visits are influenced by various factors including race, alcohol and heroin-related consequences, and heroin injection. These findings offer insights for tailored interventions amidst the opioid crisis.

- **Jacob Spaulding** | Faculty Mentor - Mark VanBerkum

*“Elevated Manganese in the Diet Affects the Lifespan of Adult Drosophila Expressing  $\alpha$ -Synuclein Mutant Proteins”*

This study examines how adding manganese to the diet affects the lifespan of fruit flies by amplifying mutant proteins associated with Parkinson's disease. Parkinson's affects movement due to the loss of specific brain dopamine neurons. By studying fruit flies, which serve as a good model for testing Parkinson's, we investigated whether manganese exposure worsens the effects of mutant flies. Findings suggest a potential link, but further research on different mutations is needed for clearer conclusions.

## ◆ PRESENTERS

- **Alexandar Trendov** | Faculty Mentor - Alexander Gow

*“AAV-Mediated PLP Regulation in a Mouse Model of PMD”*

Pelizaeus-Merzbacher Disease (PMD) is a neurodegenerative leukodystrophy caused by PLP1 gene mutations affecting myelination. Using transgenic mice as a preclinical PMD model, an adeno-associated virus (AAV) with short-hairpin RNA is injected to regulate PLP1 levels, to test this treatment strategy. Behavioral assays including forearm strength, weights, and lifespan measurements assess AAV treatment efficacy. This study aims to advance PMD research by proposing a potential treatment approach and testing it through experimental analysis.

- **Sara Trost** | Faculty Mentor - Haiyong Liu

*“Gender in a Genderless language: Is There Bias in Gender Assignment?”*

Gender plays a critical role in determining social conventions, psychological biases, and linguistic differences in language. This research project looks at arbitrarily gendered nouns, inanimate objects and proper nouns in two "genderless" languages, English and Mandarin Chinese. My goal was to ultimately track the prevalence of cross-linguistic gender biases through qualitative tests. Through analyzing the qualitative tests, I dissolved the theory of shared cross-linguistic gender biases while gaining more insight on native Chinese speakers and how they perceive and assign gender in a genderless language.

- **Sidharth Veluthakkal** | Faculty Mentor - Jitao Zhang

*“Imaging-Guided Automatic Cell Alignment for Brillouin Flow Cytometry”*

A novel imaging technique called Brillouin Microscopy is used to observe cells and tissues. It is showing huge potential in measuring their mechanical properties and biological structure. There are different techniques for Brillouin microscopy out of which I will be focusing on Brillouin flow cytometry. My research proposes a computer program which will improve the performance of this imaging technique.

- **Marko Vucelic** | Faculty Mentor - Mai Lam

*“Investigating Gene Expression of Inflammatory Markers in the Adventitia as Potential Indicators of Early-Stage Diabetic Vasculopathy in a Tissue Engineered Model”*

Our research explores innovative methods for the early detection of diabetic vasculopathy, a critical complication of diabetes. By leveraging a novel approach involving patient-derived fibroblasts and vascular tissue engineering, we analyze the impact of various blood glucose levels on vessel function. Our findings offer insights into developing a disease model for diabetic vasculopathy, allowing for new diagnostic tools and treatments. This project represents a significant step forward in understanding and managing diabetes-related vascular complications.



# WAYNE STATE UNIVERSITY

## Undergraduate Research Opportunities Program

Special Thanks To:

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