



**WAYNE STATE  
UNIVERSITY**  
Undergraduate Research  
Opportunities Program

**2023 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) would like to thank the following members of the Academy of Scholars for their participation as judges:

**Dr. Paul Karchin**

Professor, Physics and Astronomy

**Dr. Arthur Marotti**

Professor Emeritus, English

**Dr. Charles Schiffer (MD)**

Professor Emeritus, Hermatology-Oncology

**Dr. Kezhong Zhang**

Professor, Molecular Medicine and Genetics,  
and of Biochemistry, Microbiology, and Immunology

## ◆ 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) would like to thank the following members of the Academy of Scholars for their participation as judges:

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

Professor, Chemistry

### **Dr. Yaddanapudi Ravindranath**

Professor, Pediatrics

### **Dr. M. Safwan Badr**

Chair of Internal Medicine

### **Dr. Feng Lin**

Professor, Electrical and Computer

### **Dr. Donald Haase**

Professor Emeritus, German

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## ◆ PROGRAM

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### **Friday March 31, 2023, Student Center Building**

- 8:00 A.M.      **Registration—**
- 9:30 A.M.      **Poster Session**  
Life Sciences—Room 20  
Art and Humanities,  
Behavioral and Social Science,  
Engineering and Physics— Room 25
- 10:45 A.M.    **Oral Session—**  
Hilberry A,B, and C
- 11:45 A.M.    **Break**
- 12:00 P.M.    **Luncheon and Awards  
Ceremony—**  
Ballroom C

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

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**• Hilberry A**

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**Jenna Scheuerlein** — *The Queer Community and Its Relationship with Musical Artists: Inspiration or Exploitation?*

**Denise Robinson-Ford** — *Motherless Child*

**Chastity Savage** — *Parasocial Interaction & Mental Health*

**• Hilberry B**

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**Jacob Klein** — *Autoignition-Assisted Laminar Flame Speed Regime at Elevated Gas Pressure and Temperature*

**Adjoa Biney** — *The Biological Effects of Prenatal Stress on the Developing Fetus Before and After Birth*

**Tristan Wrong** — *Synthesis and Biological Applications of Light-Releasable Sugars to Control Cell Behavior*

**• Hilberry C**

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**Shane Tinsley** — *National Institutes of Health Funding to Urology and Other Departments for Urologic Oncologic Diseases: Analysis of NIH RePORTER Database*

**Simisolaoluwa Olabode** — *Assessing Funding and Public Interest into Male and Female Infertility: Analysis of NIH RePORTER & Google Trends Databases*

**Majd Yahya** — *Examining the impact of repeated polysubstance exposure on locomotor activity using a non-contingent pre-clinical rat model*

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**♦ POSTER SESSION**

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**Maryam Abbawi | Poster 3**  
*Backward Walking Training Induces Structural Changes in the Superior Cerebellar Peduncle: A Pilot Myelin Water Imaging Study*

**Zade Abou-Rass | Poster 53**  
*Cognitive and Motor Correlates of Spatial Navigation (SpaN)*

**Mathew Al Najar | Poster 26**  
*Engineering VIP for Improved Stability and Pharmacokinetics for Potential Therapeutic Use*

**Maram AlTurky | Poster 37**  
*Coping With COVID Through Tangled and Social Media*

**Madeline Badrak | Poster 40**  
*Electrospun Silk Fibroin and Hyaluronic Acid Based Nerve Conduit for Peripheral Nerve Regeneration*

**Sattvik Basarkod | Poster 61**  
*Mobile Skin Conductance Response is a Biomarker for Future PTSD and Anxiety Symptoms in Children with Trauma Exposure*

**Bridget Bone | Poster 20**  
*A novel molecular tool to study local presynaptic translation influence on learning and memory*

**Carmen Carpenter | Poster 58**  
*Sleep and Fear Extinction Recall: Associations Among Sleep Duration, Anxiety Symptoms, and Fear Extinction Neural Circuitry in Youth*

**Hana Cox | Poster 31**  
*Cannabidiol (CBD)'s Long-term Effects on the Reproductive System of Rats Treated with CBD in the Neonatal Period*

**Zahraa Ghosn | Poster 5**  
*Elevated Dietary Divalent Metals Decrease Manganese Toxicity in *Drosophila melanogaster* Flies*

**Dillon L. Glenn | Poster 59**  
*Preferences for Couple-Based Smoking Cessation Interventions Among Smoker Couples: A Discrete Choice Experiment*

**Aicha Khalaf | Poster 25**  
*Structure of the Nervous System in Developing Grass Carp*

**Iman Manzoor | Poster 36**  
*Claudin-11-Deficient Mice – A Potential Novel Model of Skeletal Muscle Spasticity*

**Mariya Matsko | Poster 22**  
*Effects of Acute Meditation and Exercise on Anxiety and Endocannabinoid Levels in Youth*

**Fatemeh Mozaffari Khamseh | Poster 41**  
*Elevated Dietary Divalent Metals Decrease Manganese Toxicity in *Drosophila melanogaster* Flies*

**Justin Nelson | Poster 33**  
*Development of a Microfluidic-Based Mucus Model”*

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## ◆ POSTER SESSION

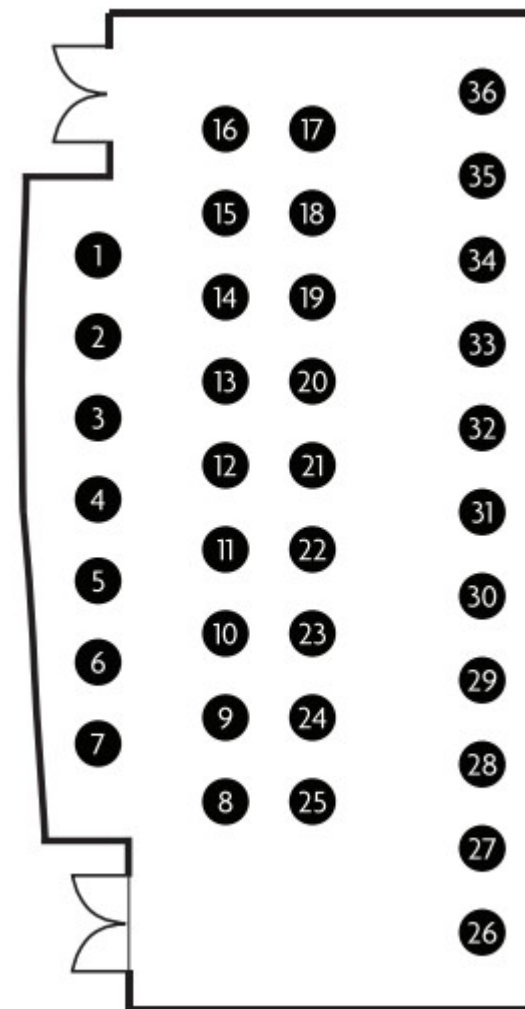
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- **Marcos Ochoa | Poster 17**  
*Development of a Peptide-based Insulin Sensitizer Through Targeting SKIP Protein-Protein Interactions*
- **Neel Patel | Poster 45**  
*Identification of Novel Inhibitors Targeting KRAS-SOS1 Interactions by Structure-Based Drug Design*
- **Shaqyna Ross | Poster 55**  
*Mistrust in Healthcare*
- **Madeline Sigler | Poster 43**  
*Modeling Insect Speciation Under Climate Change Scenarios*
- **Lexi Soltesz | Poster 29**  
*Mild Intermittent Hypoxia: A Prophylactic for Autonomic Dysfunction in Individuals with Spinal Cord Injuries*
- **Bethany Stoddart | Poster 56**  
*Covid-19 and Policing: Understanding Officer' Perception of the Pandemic as a Stressor*

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## ◆ POSTER DISPLAY MAP

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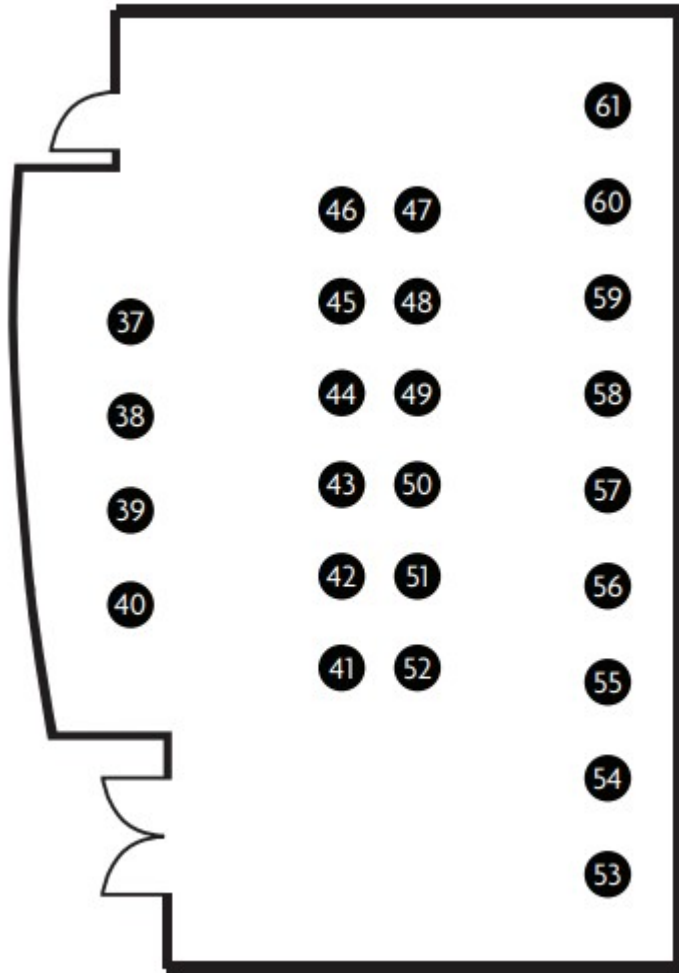


**Student Center Building Room 20**

Life Sciences Room



## ◆ POSTER DISPLAY MAP



**Student Center Building Room 25**

Arts & Humanities and Behavioral & Social Sciences and  
Engineering & Physics Room

## ◆ PRESENTERS

- **Maryam Abbawi** | Faculty Mentor - Nora Fritz

*“Backward Walking Training Induces Structural Changes in the Superior Cerebellar Peduncle: A Pilot Myelin Water Imaging Study“*

Multiple Sclerosis affects walking and balance, resulting in an increased prevalence of falls. Participants completed 8-weeks of backward walking (BW) training and a brain MRI before and after the training. We examined the impact of the intervention on walking, balance, and a motor tract in the brain, as well as the relation of the change in the tract to the change in function. Our data suggests that BW training produces both structural and functional changes.

- **Zade Abou-Rass** | Faculty Mentor - Nora Fritz

*“Cognitive and Motor Correlates of Spatial Navigation (SpaN)”*

Spatial navigation (SpaN) is a hippocampal dependent process that is potentially useful for successful balance. The primary objective of this study is to identify a possible connection between motor function and SpaN. We will also investigate any association between SpaN and cognition, and relations between subjective and objective SpaN measures in immersive and non-immersive environments. Our main hypothesis is that better SpaN performance will be related to better motor and cognitive function.

- **Mathew Al Najar** | Faculty Mentor - Andrew Lipchik

*“Engineering VIP for Improved Stability and Pharmacokinetics for Potential Therapeutic Use “*

Vasoactive Intestinal Peptide is a hormone that can be potentially used as a therapeutic to treat diseases like type 2 diabetes and rheumatoid arthritis. Currently, the problem with the peptide is the small amount of time that it can last in the body. The peptide needs to be modified to last longer in body without losing any functionality. Here, we modified the peptide and compared it to the wild type in seeing stability and functionality.

## ◆ PRESENTERS

- **Maram AlTurky** | Faculty Mentor - Anne Duggan

*“Coping With COVID Through Tangled and Social Media”*

*“Coping With COVID Through Tangled and Social Media”* explores the use of fairy tales as a coping mechanism during times of tragedy and trauma by examining previous research and relating it to the context of the pandemic. I further explore the utilization of fan-fiction style videos on YouTube that merge the personal experiences of the YouTubers with the narratives of Disney’s Tangled to provide comfort, hope, and joy to both the creators and audiences.

- **Madeline Badrak** | Faculty Mentor -Harini Sundararaghavan

*“Electrospun Silk Fibroin and Hyaluronic Acid Based Nerve Conduit for Peripheral Nerve Regeneration”*

Peripheral neuropathy from gaps in the peripheral nervous system causes patients to lose their motor and sensory abilities. Current treatments involve inserting a section of a patient’s own healthy nerve into the injury site, but this causes additional stress to the patient and may not lead to a fully functioning recovery. Here I present a method of creating a conduit of biomaterial made from silk fibroin and hyaluronic acid capable of facilitating human nerve regrowth.

- **Sattvik Basarkod** | Faculty Mentor - Tanja Jovanovic

*“Mobile Skin Conductance Response is a Biomarker for Future PTSD and Anxiety Symptoms in Children with Trauma Exposure”*

Childhood trauma is a major crisis in urban Detroit, and my research is assessing what factors allow certain individuals to develop PTSD and anxiety symptoms after a traumatic event, while others to stay resilient. This paper suggests that a mobile, low cost and non invasive device, called eSense, may be useful in identifying at risk children. This can potentially allow clinicians to provide treatment in an effective manner before the trauma symptoms worsen in the future.

## ◆ PRESENTERS

- **Adjoa Biney** | Faculty Mentor - Molli Spalter

*“The Biological Effects of Prenatal Stress on the Developing Fetus Before and After Birth”*

Growing data suggests that even minor levels of maternal stress during pregnancy have an impact on the developing fetus. Cortisol (a stress hormone) which is three times more abundant in expectant mothers, is essential for the normal development and maturity of the fetus however, high elevations of cortisol can be detrimental to the normal development of the fetus. Reduced placental efficacy as a result may affect the transfer of nutrients from mother to child.

- **Bridget Bone** | Faculty Mentor - Joongkyu Park

*“A novel molecular tool to study local presynaptic translation influence on learning and memory “*

What is learning and memory? We’re not sure, but we do know it involves the formation of protein in your brain cells. Tiny workers within brain cells make protein to function and respond to your environment. They can be found within different compartments of the brain cell. The goal of my research is to determine if the workers in one specific compartment, called the presynapse, make protein that influences our ability to learn and form memories.

- **Carmen Carpenter** | Faculty Mentor - Hilary Marusak

*“Sleep and Fear Extinction Recall: Associations Among Sleep Duration, Anxiety Symptoms, and Fear Extinction Neural Circuitry in Youth “*

Limited research has investigated the link between sleep, anxiety, and fear extinction in children. Fear extinction is the inhibition of a conditioned fear. Research in adults suggests that both anxiety and sleep issues are linked to issues with extinguishing fear. The present study utilizes self-reported sleep duration, anxiety symptoms, fear responses, and fMRI imaging to explore the relationship between sleep, anxiety, and fear extinction in children aged 6-17.

## ◆ PRESENTERS

- **Hana Cox** | Faculty Mentor - Susanne Brummette

*“Cannabidiol (CBD)’s Long-term Effects on the Reproductive System of Rats Treated with CBD in the Neonatal Period“*

A continuation of a neo-natal CBD study on rats. Upon sacrificing the rats, the testes, ovaries, and blood samples were taken to test whether the quality of the reproductive system was affected by the cannabidiol. The testes and ovaries will be weighed and compared between the control and the exposed rats. Also, an ELISA assay will be used to test and compare the blood samples.

- **Zahraa Ghosn** | Faculty Mentor - Mark VanBerkum

*“Elevated Dietary Divalent Metals Decrease Manganese Toxicity in Drosophila melanogaster Flies“*

Manganese (Mn) is an important metal that is required in trace amounts. Exposure to high levels is toxic and may induce Parkinson-like motor defects. Research suggests that Mn exists in equilibrium along with other divalent metals (Calcium, Magnesium, Zinc, and Iron). My project works towards understanding the relationship between Mn toxicity and the divalent metal ions in *Drosophila melanogaster* flies. My data suggests that divalent metal ions have a protective effect against Mn toxicity.

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

*“Preferences for Couple-Based Smoking Cessation Interventions Among Smoker Couples: A Discrete Choice Experiment“*

This study examines preferences for couple-based interventions regarding format and content, as well as each partner’s willingness to support, and knowledge of their understanding of the support role. Greater insight into participant preferences is critical to improving the effectiveness of couple-based smoking cessation interventions. A discrete choice experiment (DCE)—i.e., a survey designed to elicit preferences—supplemented with a think-aloud method was implemented better to understand smoker couples' preferences for smoking cessation interventions.

## ◆ PRESENTERS

- **Aicha Khalaf** | Faculty Mentor - Christopher Kassotis

*“Structure of the Nervous System in Developing Grass Carp“*

Grass carp (*Ctenopharyngodon Idella*) have become an invasive species in North American freshwater river systems, causing significant damage to the Great Lakes fisheries industry. Studies have shown they likely settle into new environments between the larval and juvenile stages, proving the need for a deeper understanding on how their brain works during this critical period. Assessing mid-brain structures important for sensory processing will provide new information on how swimming and orienting behaviors develop.

- **Jacob Klein** | Faculty Mentor - Omid Samimi Abianeh

*“Autoignition-Assisted Laminar Flame Speed Regime at Elevated Gas Pressure and Temperature“*

Laminar flame speed is the speed at which a laminar, or smooth, flame front propagates through a combustible fuel-air mixture. Autoignition is the spontaneous ignition of a fuel-air mixture when a critical temperature and pressure is reached. Both of these characteristics are important in the hydrocarbon combustion process. This research project focuses on studying how the autoignition environment affects flame propagation and compares current simulations with measurements of autoignition-assisted laminar flame speeds.

- **Iman Manzoor** | Faculty Mentor - Joseph Roche

*“Claudin-11-Deficient Mice – A Potential Novel Model of Skeletal Muscle Spasticity“*

Many neurons are insulated by sheaths of myelin, which ensures rapid transmission of neural signals. Claudin-11 is a protein involved in proper expression of myelin in the central nervous system. Previous research has shown that mice which lack claudin-11 have decreased function in their hind limbs. The goal of this project was to determine if this hind limb weakness can be classified as spasticity, which is a neuromuscular condition characteristic of myelin-related neurological diseases.

## ◆ PRESENTERS

- **Mariya Matsko** | Faculty Mentor - Hilary Marusak

*“Effects of Acute Meditation and Exercise on Anxiety and Endocannabinoid Levels in Youth*

The beneficial effects of exercise and meditation on mental health are well-established in adults. This project focuses on the research of acute, moderate and low-intensity exercise as well as meditation to determine if similar advantageous effects occur in youth. Mental health problems typically begin during childhood and adolescence, which coincides with developmental changes in endocannabinoid (eCB) signaling. eCB levels were collected to investigate whether eCBs may explain some of the beneficial effects of these interventions.

- **Fatemeh Mozaffari Khamseh** | Faculty Mentor - Joseph Sklenar

*“Elevated Dietary Divalent Metals Decrease Manganese Toxicity in Drosophila melanogaster Flies“*

Manganese (Mn) is an important metal that is required in trace amounts. Exposure to high levels is toxic and may induce Parkinson-like motor defects. Research suggests that Mn exists in equilibrium along with other divalent metals (Calcium, Magnesium, Zinc, and Iron). My project works towards understanding the relationship between Mn toxicity and the divalent metal ions in *Drosophila melanogaster* flies. My data suggests that divalent metal ions have a protective effect against Mn toxicity.

- **Justin Nelson** | Faculty Mentor - Ashis Mukhopadhyay

*“Development of a Microfluidic-Based Mucus Model”*

The key to optimizing our bodies' defense mechanisms to promote better health requires a greater understanding of the behavior of viruses trapped within our bodies' mucus layer that lines our respiratory tracts. However, performing quality research on real systems is difficult due to many uncontrollable factors. This project aims to create a model of the mucus system to allow for quality testing of nanoparticle behavior in such as environment.

## ◆ PRESENTERS

- **Marcos Ochoa** | Faculty Mentor - Andrew Lipchik

*“Development of a Peptide-based Insulin Sensitizer Through Targeting SKIP Protein-Protein Interactions*

In 2019 around 1.5 million people worldwide died due to type 2 diabetes. The total cost of managing diabetes in the U.S is \$327 billion (about \$1,000 per person in the U.S) annually. Insulin resistance is a precursor for type 2 diabetes and is necessary to become diabetic, but not sufficient alone. This project is on developing a therapeutic solution to manage insulin resistance, a precursor to type II diabetes.

- **Simisolaoluwa Olabode** | Faculty Mentor - Ali A. Dabaja

*“Assessing Funding and Public Interest into Male and Female Infertility: Analysis of NIH RePORTER & Google Trends Databases”*

Prior research has shown a disparity in research funding between specific specialties and their respective diseases. This project aims to study the gap in research funding between infertility in U.S. Departments of Obstetrics and Gynecology and Departments of Urology. In addition, the study will identify public interests in female and male infertility through Google Trends.

- **Neel Patel** | Faculty Mentor - Yu-ming M. Huang

*“Identification of Novel Inhibitors Targeting KRAS-SOS1 Interactions by Structure-Based Drug Design”*

The KRAS protein is a crucial protein within the cell division cycle. When this system goes haywire, the development of cancerous cells results. We have used a set of computational methods to develop around 60 potential drugs and identify three separate binding sites for the KRAS protein. These drugs will be sent to our collaborating pharmaceutical lab where they will be tested on KRAS cancer cell lines to verify their effectiveness.

## ◆ PRESENTERS

- **Denise Robinson-Ford** | Faculty Mentor - Faith Doyle

*“Motherless Child”*

Performance of 1st person reenactment of 1850 enslaved person named, Mirah. Based on a true story of Denise Robinson-Ford’s grandmother.

- **Shaqyna Ross** | Faculty Mentor - Maha Albdour

*“Mistrust in Healthcare”*

This research project is an Investigation of Associations Between Race, Ethnicity, and Past Experiences of Discrimination with Medical Mistrust.

- **Chastity Savage** | Faculty Mentor - Jessica Moorman

*“Parasocial Interaction & Mental Health”*

This study will be conducted by using a cross sectional survey administered via Qualtrics survey software. There will be a series of questions and scales that each participant will take. Within the survey packets there will be scales that will give us accurate measures of media use, parasocial interaction, depression, anxiety, happiness, social support, and social closeness for each individual participant.

- **Jenna Scheuerlein** | Faculty Mentor - Molli Spalter

*“The Queer Community and Its Relationship with Musical Artists: Inspiration or Exploitation?”*

Queer audiences are an influential portion of a musical artist’s fanbase. As a result, artists have adapted practices that acknowledge their queer fanbases, in both positive and negative ways. Sometimes these individuals are overlooked, and other times these individuals are exploited, whether it be for money, inspiration, or simply their culture. With this in mind, my research analyzes the role queer communities play in shaping musical art.

## ◆ PRESENTERS

- **Madeline Sigler** | Faculty Mentor - Scott Burdick

*“Modeling Insect Speciation Under Climate Change Scenarios”*

A new multivariable approach to increase accuracy of Temporal Isolation, the separation of populations due to a difference in time. This model includes the influence of changing host-plant variables as well as the insect in order to increase modeling precision. Further developments of the model could include temperature and humidity variables influence on the base model.

- **Lexi Soltesz** | Faculty Mentor - Omid Samimi Abianeh

*“Mild Intermittent Hypoxia: A Prophylactic for Autonomic Dysfunction in Individuals with Spinal Cord Injuries”*

Individuals with spinal cord injury (SCI) above the sixth thoracic vertebrae experience autonomic dysfunction, or an inability to control blood pressure that negatively impacts rehabilitation efforts and quality of life. There is currently no prophylaxis for autonomic dysfunction in these individuals. Our preliminary data shows that mild intermittent hypoxia can improve autonomic dysfunction in those with SCI.

- **Bethany Stoddart** | Faculty Mentor - Charles Klahm

*“Covid-19 and Policing: Understanding Officer’ Perception of the Pandemic as a Stressor”*

Covid-19 AND Policing: Understanding Officer’ Perception of the Pandemic as a Stressor Student Researcher: Bethany Stoddart Faculty Mentor: Charles Klahm Police officers have faced challenges because of the Covid-19 pandemic. This research project is focused on how the Covid-19 pandemic contributed to the stress of police officers’. Specifically the study looked at how Covid-19 changed police officers’ work routine, increase stress due to contracting the virus, and mental health problems as a result of the pandemic. The researcher conducted a 20 question survey at Wayne State University Police Department to gain knowledge on the topic.

## ◆ PRESENTERS

- **Shane Tinsley** | Faculty Mentor - Firas Abdollah

*“National Institutes of Health Funding to Urology and Other Departments for Urologic Oncologic Diseases: Analysis of NIH RePORTER Database”*

The National Institutes of Health funds a large portion of research projects inside and outside the United States of America. However, previous studies have illustrated disparities in research funding amongst different clinical departments. Currently, there is no research into research funding trends for urologic cancers in different medical departments. This study is to examine and identify disparities in research funding amongst Urology, Radiology/Radiation-Oncology, Internal Medicine, and Pathology departments in the United States of America.

- **Tristan Wrong** | Faculty Mentor - Charles Fehl

*“Synthesis and Biological Applications of Light-Releasable Sugars to Control Cell Behavior”*

All cells in the human body use sugar in metabolism. However, the lesser known but equally important function of sugar is its role in modifying proteins and consequently, modifying their functions. O-linked N-acetylglucosamine, or O-GlcNAc, is a widespread sugar modification that is active in many disease states such as cancer, diabetes, and neurodegenerative diseases. By utilizing organic synthesis techniques, we can obtain a UV light releasable sugar that will allow for the control of rapid O-GlcNAc events in living cells.

- **Majd Yahya** | Faculty Mentor - Shane Perrine

*“Examining the impact of repeated polysubstance exposure on locomotor activity using a non-contingent pre-clinical rat model “*

There is an ongoing rise in mortality in cocaine-associated deaths as a result of drug contamination with opioids, such as fentanyl. Furthermore, there is a lack of knowledge regarding the behavioral and neurochemical risks associated with fentanyl-tainted cocaine. We investigated rat locomotor activity (LMA) and molecular implications induced by saline (control), high dose cocaine, or a cocaine and fentanyl mixture. Exposure to cocaine and the mixture of cocaine and fentanyl increased LMA compared to control.

## ◆ NOTES

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◆ NOTES



◆ NOTES



WAYNE STATE  
UNIVERSITY

Undergraduate Research Opportunities Program

Special Thanks To:

Mark Kornbluh

Provost

Matthew Orr

Program Coordinator

Academic Success Center

Adam Conigliaro

Graduate Student Assistant

Academic Success Center

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