



Symposium Undergraduate Research Fellow (SURF) Awards **2022-2023 Research Fellows**



Through donor support, the SURF program provides an opportunity for outstanding new and current students to extend their educational experience and academic passion beyond the classroom.

Fundraising efforts for the fellows began enthusiastically in the fall of 2006. Supporters of the Undergraduate Symposium were excited to learn of an opportunity to support student research at a more engaged level. Since the program's inception, donors have supported 235 unique students. We have donors who have contributed since the beginning, those who chose to support through their estates, and even new donors who are alumni of the program.

Selected student fellows are immediately matched with a faculty mentor in the student's chosen field of study. SURFS are engaged in a research project that is of mutual interest between the student and faculty.

Students are provided with a \$1,000 stipend; faculty are provided up to \$1,000 to support the project. SURF positions are awarded for one year with the possibility of renewal.

As a culmination of the year's work, SURFs present at the EMU Undergraduate Symposium).

***We congratulate the following students on
their research awards!***



Rana Aabed

ChongMan Chow, faculty mentor
Psychology
SURF in Honor of Anthony & Lois
Evans

Relationship Quality as a Mediator
Between Parenting Styles & Body
Issues in Adolescent Girls

Body dissatisfaction has been a pressing issue for many women and girls. This study examines the relationships between parenting styles (authoritarian, authoritative, permissive) and adolescent body dissatisfaction, and how these relationships are mediated by parent-adolescent relationship quality. This study hypothesizes that high authoritarian (but low authoritative) parenting style will be associated with higher levels of body dissatisfaction. Such associations would be mediated by relationship quality. No specific hypothesis was made for permissive parenting due to past literature.



Hind Al Khashali

Hedeel Evans, faculty mentor
Neuroscience
Dykema, sponsor

Opposing Roles of Heparanase &
IGFBP-3 in Regulating A549 Lung
Cancer Cell Survival

Heparanase is a key regulator of the hallmarks of cancer, while conversely, IGFBP-3 is known to exert cytotoxic effects. In this study, we examined the roles of heparanase and IGFBP-3 in regulating non-small cell lung cancer survival. We found that H1299 cells, known to be p53-null with no expression of IGFBP-3, had higher heparanase levels and activity and higher levels of heparan sulfate (HS) in the media compared to the media of A549 cells. Inhibiting heparanase activity or its expression using siRNA had no effect on the levels of IGFBP-3 in the media of A549 cells, reduced the levels of soluble HS fragments, and led to decreased interactions between IGFBP-3 and HS in the media.



Merrick Breckler

Heather Shouldice, faculty mentor
Music & Dance

Ed & Suzanne Jakeway, sponsor

**Exploring the Relationships Between
Ensemble Music Teachers' Beliefs &
Inclusion of Students with
Developmental Disabilities**

Since the passing of IDEA, students with disabilities have been underrepresented in secondary ensemble music education in the U.S., which some attribute to music teachers' lack of training in working with these students. There is also evidence that ensemble music teachers' attitudes toward students with disabilities may be a contributing factor. Research suggests some ensemble music teachers believe inclusion of students with disabilities hinders the progress of other students, negatively impacts ensemble performance quality, or prevents high scores at adjudicated events. This study will investigate relationships between these different beliefs and attitudes.



Kaili Brooks

Carla Damiano, faculty mentor
World Languages

Thomas Layher, sponsor

**Creating the Independent Child: A
Case for the Adoption of German
Child-Rearing Practices**

During my time spent in the former Federal Capital of Germany in Bonn, I was struck by the independence of the German children. They bike unaccompanied through the streets, traverse public transportation alone, and play unsupervised. It was rarer to see a German child with a parent than without. This is in contrast to America, where children are heavily monitored by parents at all ages. This project compares current parenting practices between Germany and the United States, along with the legislation that allows Germans substantial family leave and monetary support for their family. My research proposes specific ways in which American parents and children could benefit from the German model.



Keanu Caridad

**Dennis O'Grady, faculty mentor
Communication, Media and
Theatre Arts
Molly Luempert-Coy & DTE Energy
Foundation, sponsors
Communication Privacy
Management in Organizational
Settings**

Communication privacy management theory focuses on an individual's decision to conceal private information or share it with others. To date, the theory has primarily been used to study interpersonal relationships. However, individuals in organizations also face the decision to disclose or not disclose private information with other employees. In this research the author adopts an auto-ethnographic approach to study privacy management in organizations, focusing on his employment in the food service industry, human resources, and higher education. From this analysis, directions for future research are presented.



Jemone Cochran II

**Andrew Mansfield, faculty mentor
Mechanical Engineering Technology
Ian Pendelton & Vertex
Pharmaceuticals, sponsors
Construction of an Engine
Dynamometer System**

Engine dynamometers are test systems used to evaluate internal combustion engine performance and conduct research. Currently, a new engine dynamometer system is under construction in the Energy Systems Laboratory at EMU, which will be operating using a modified production 3-cylinder 1.0L Ford engine. My role in this project was to assist in the design, construction, and validation of various customized sub-systems in the engine dynamometer system, including exhaust ventilation, air intake, fueling, and electrical components. Next phases of the project will include; determining baseline engine performance both when motoring and firing, and determining engine performance and system operating limits for various operating parameters including power, torque, and coolant and oil temperatures.



Savannah Covault

Claudia Drossel, faculty mentor
Psychology
Retirement Income Solutions,
sponsor

**Should Students' Legal Issues be
Considered when Assessing
Stress & Mood Disorders?**

There is a strong relationship between mood disorders and everyday stressors, involving academic and work demands, financial or housing difficulties, chronic disease status, or relationship strain. As recent efforts have outlined the important role of public access to legal aid for problem-solving (Sandefur, 2015), the current study will conduct a legal needs assessment of students. Results from an online survey of EMU students will describe legal needs and examine whether these correlate with stress, depression, and anxiety, to suggest novel points of intervention to alleviate the current mental health crisis.



Coreena Forstener

Kimberly Barrett, faculty mentor
Sociology, Anthropology and
Criminology
Bank of Ann Arbor, sponsor

**The Criminalization of Psychiatric
Illness: Gender Differences in
Criminal Arrests**

In the United States, prisons and jails are commonly referred to as, "de facto asylums," since correctional systems have become the largest mental health facility. Data shows that mentally ill persons are over-represented in the criminal justice system while psychiatric care remains inadequate. While past literature has shown what disorders are most commonly represented within the incarcerated population, this analysis aims to identify how the role of psychiatric symptoms may differ among men and women leading to criminal arrests prior to incarceration.



Haylee Haik

**Qin Hu, faculty mentor
Engineering Technology
Dale and Gloria Heydlauff &
American Electric Power,
sponsors**

**Creating a Brain Computer
Interface for Maintaining
Concentration**

The purpose of this project is to develop a warning system that utilizes data collected from electroencephalography (EEG) technology to evaluate user focus. An EEG cap will record brainwave data for a user performing tasks requiring active or passive engagement. The EEG signals will be processed and analyzed to abstract features associated with active and passive tasks. After these initial calibrations, an external device will be created to alert the user when they enter or exit a focused state. Lastly, a machine learning algorithm will be developed to continuously refine the accuracy of the focus monitoring system for individual users as more data is collected.



Peter Landor

**Cara Shillington, faculty mentor
Biochemistry**

**William Fennel SURF Endowment
Effects of Macronutrient
Availability on Growth in a
Tarantula (*Chromatopelma
cyaneopubescens*)**

Nutrient composition plays a pivotal role in building of tissues and overall growth rates in animals. In turn body size can be indicative of fitness. In this study, tarantulas were provided with nutritionally-biased diets to assess effects of macronutrient content on growth. As obligate predators, supplementation was done using a single prey species fed three different diets. Tarantulas grow through molting of exoskeletons. As measures of growth, we tracked days between molts and measured sizes of exoskeletons post-molt. While no differences in growth were noted after three molts, a longer duration study with more molts may be needed to reveal growth differences in long-lived species.



Karley Misek

**Elisabeth Daumer, faculty mentor
English, Language and Literature
Retirement Income Solutions,
sponsor
Muriel Rukeyser as Myth-Maker**

Mythology has been a popular field in literature for thousands of years due to its relatability and exploration of life, power, identity, gender, and society. 20th century poet Muriel Rukeyser implements Greek and Roman mythology in careful and elaborate forms of revision and complete rewriting. This paper explores Rukeyser as a myth-maker through several of her poems, as well as researching the purpose of mythology in her work and literature as a whole. Her use of myth explores classic stories in a feminist lens to speak to personal and public experiences. Rukeyser's perspective on mythology relates to issues and texts that are important today through exciting and radical methods



Olivia Robinson

**Susan Booth, faculty mentor
Arts Management
William Fennel SURF Endowment
Creativity Continued:
Implementing EMU Arts
Management & Administration's
New Branding Strategy**

At the 42nd Undergraduate Research Symposium, The EMU Arts Management & Administration (AMA) Program unveiled its new landing page, coupled with a new brand identity & goals for the future. Over the past year, EMU AMA has implemented its previous research to make our new brand an integrated and integral component of our program. In collaboration with the School of Communication, Media, & Theatre Arts, AMA alumni, and EMU's Amplifying the Arts, EMU AMA intends to share our branding & marketing strategies in action. This presentation will report on the recent design & distribution of new marketing materials, including alumni interviews, digital & print media, and radio advertising.



Basmah Shahid

**Hannah Seidel, faculty mentor
Biology**

**William Fennel SURF Endowment
Investigating the Genetics of
Clear Shed Skin in Ball Pythons
(*Python regius*)**

Ball pythons vary in color, but little is known about the genetics of these color variants. Here we investigate the genetics of a variant called 'Ghost' with dark coloration but clear shed skin. We hypothesize that this variant is caused by a mutation in the gene encoding melanophilin. Melanophilin helps transfer melanin pigments from melanin-producing cells to melanin-receiving cells. Mutations in this gene in humans cause clear skin and hair, a condition known as Griscelli syndrome type 3. Our approach is to amplify and sequence regions of the melanophilin gene in ball pythons and to compare sequences from Ghost and non-Ghost animals to identify a mutation responsible for the Ghost phenotype.



Nico Slowik

**Eric Acton, faculty mentor
English Language and Literature
Ian Pendelton & Vertex
Pharmaceuticals, sponsors
Female- More Than a Vessel**

The Oxford English Dictionary defines the word "female," when used as a noun, as "a person of the sex that can bear offspring; a woman or a girl." In this research, I explore the implications of the term, especially with respect to the term "woman." I propose that "female" can exclude members of the LGBTQIA+ spectrum, as well as people who may not be able to bear children due to infertility reasons. I also argue that this term can come off as dehumanizing and sexualizing—owing to its contrast with "woman," which encodes that its referent is an adult human—and explore how this effect relates to context.



Jacklyn Staffeld

**Natalie Dove, faculty mentor
representative
Psychology**

Dykema, sponsor

Effects of Pathway-Specific Brain-Derived Neurotrophic Factor on Sign & Goal-Tracking Behaviors

Brain-derived neurotrophic factor (BDNF) levels may contribute to individual differences in learning behaviors. We injected Cre recombinase into the nucleus accumbens (NAc) and a Cre-dependent BDNF virus into the ventral hippocampus (vHPC) to selectively increase BDNF production in the NAc-vHPC pathway. Rats were then tested for behavioral differences in a Pavlovian conditioned approach. These results may suggest a pathway-specific role for BDNF in producing incentive-learning patterns that are associated with vulnerability to addiction in human beings.



Vheena Villareal

**Clyde Barnett III, faculty mentor
Leadership & Counseling
Thomas Sidlik, sponsor**

Centering Student Voice in Higher Education: Considerations for Critical Leadership

Student voice challenges everyone within educational spaces to reconsider power dynamics between students and instructors that can either propel or repel the relationship-building necessary for learning (Howard, Milner-McCall, & Howard, 2020; Mitra, 2008; Sparks, 2006). In recognizing positional power (Carroll & Firth, 2021), faculty and staff must accept the responsibility to disrupt traditional knowledge frameworks (Shields, 2010), and intentionally shift power to students beyond student groups and organizations. After exploring critical leadership theories (Khalifa, Gooden, & Davis, 2016; Shields, 2016), the author explores the impacts of higher education decision making on young adults that either includes or excludes student voices.