

TWELFTH ANNUAL
MONTANA STATE UNIVERSITY BILLINGS
**RESEARCH AND
CREATIVITY SYMPOSIUM**
APRIL 11, 2025



Lisa Blomquist
Cross Pollination - A Love Story: The Actors

2025 SYMPOSIUM

Montana State University Billings is proud to host the eleventh annual Research and Creativity Symposium (RCS) on the University campus April 11, 2025. Sponsored by the Office of Grants and Sponsored Programs, the Office of the Provost, the University Honors Program, and Montana IDeA Networks of Biomedical Research (INBRE), the symposium provides the opportunity for undergraduate and graduate students of all fields to present their research and creative scholarship in a public forum. This program includes abstracts from the research projects as well as artworks from the Juried Student Exhibition.

The calendar below lists names and times for the live presentations. As some students are not participating live, links to online presentations in ScholarWorks will be available on our website here at a later date: msubillings.edu/research

APRIL 11 Student Union Building – Glacier Room	
12:10	Symposium Welcome from Interim Provost Dr. Richard Beer Keynote Introduction by Dr. Jennifer Scroggins
12:15	Keynote Speaker Shalese Gentry
12:45	Poster Session
2:30	Presentation of Awards <ul style="list-style-type: none">• Dean Kurt Toenjes• Dean Susan Gilbertz
APRIL 24 Liberal Arts Building – Northcutt Steele Gallery	
5:00	Reception for Juried Student Exhibition LA first floor

KEYNOTE SPEAKER

Shalese Gentry

MSUB Alumna, University Lecturer
Social Sciences & Cultural Students Department
Montana State University Billings

Shalese Gentry is a university lecturer with a passion for military history and gender studies. She earned her undergraduate degree from Montana State University Billings before completing a Master of Arts in Sociology, where she focused on how the Department of Defense discusses military sexual trauma. Beyond research and advocacy, you can find her hiking scenic trails, perfecting homemade bread, or bringing creativity to life through knitting and sewing. A firm believer in both innovation and tradition, she cultivates ideas much like she does her garden—with patience, curiosity, and care.

Keynote Title:

Defense versus Discovery: Applying the Sociological Imagination to Everyday Life

THANK YOU **TO ALL FACULTY MENTORS**

Dr. Madison Collins
Dr. Jason Comer
Dr. Stephen Eliason
Dr. Lynn George
Dr. Hashini Herath
Dr. Jennifer Lynn

Dr. Ambrin Masood
Dr. Cody Patton
Dr. Mara Pierce
Dr. Tom Rust
Aaron Schultz
Dr. Jacob Thacker
Dr. Richard Warner

Posters

Uncovering Bacterial Communities in Five Mile Creek Through Environmental DNA Sequencing

Student Researcher: Sarah Abeyta, B.S. Biology

Faculty Mentor: Dr. Jason Comer

Yellowstone County contains several bodies of water that have undergone very little research, yet can harbor diverse bacterial communities, including pathogens, beneficial microbes, and antibiotic-resistant strains. In this study, environmental DNA was extracted from water samples in Five Mile Creek in Billings, MT. Samples were sequenced and evaluated to identify the biodiversity of microbial species and assess any risks to human health. I hypothesize that there will be a wide range of microbial populations, including potentially hazardous species. This research contributes to the advancement of information regarding the impact that environmental microbiology has on public health and encourages microbial surveillance.

The Girl Who Wanted to Be God: Lady Lazarus and the Romanticization of Mental Health

Student Researcher: Jorden Andes, B.A. English

Mentor: Aaron Schultz

Sylvia Plath is a key poet of the modern era. Her poems are disorienting, loud, and beautifully sculpted, which makes her difficult to understand to even the most passionate poetry lovers. One of the most recognizable poems of hers, "Lady Lazarus," tells about her life and death. Along with Plath's poems, especially ones such as "Lady Lazarus" which discuss her suicide attempts, scholars tend to focus on her mental health. She is often called a tortured artist, a pitiful mother, a feminist, and a madwoman, though "Lady Lazarus" is not just the story of a woman who commits suicide in an act of rebellion against the patriarchy. It is a story about a woman fighting against the public's perverted eye in her battle against mental health.

Theft in Retail Stores in Billings, MT

Student Researchers: Aryn Blanchard, B.S. Criminal Justice; Guillermo Gonzalez, B.S. Criminal Justice; Ryan Hanley, B.S. Criminal Justice; Dylan Nelson, B.S. Criminal Justice & B.S. Sociology

Faculty Mentor: Dr. Stephen Eliason

This research will investigate and contextualize the relationship between socioeconomic status, environmental conditions, and theft rates in urban settings. A survey will be sent to Loss Prevention supervisors in Billings Montana to gather information on the types of theft they have experienced in their stores.

Beyond the Visuals: Disability in Museums

Student Researcher: Elwi Borsum, B.S. Liberal Studies

Faculty Mentor: Dr. Mara Pierce

Museums revolve around bodies: how they look, function, occupy space, and are perceived. Disabled people have been present since museums' inception; we've been witnessed through freak shows, galleries, and mostly recently, how ADA protocols dictate museum design. Yet disabled people lack agency in higher operations: Able-bodied directors, board members, and curators make decisions without disabled people in mind. Museums reflect and help define what society thinks of as "normal," which is why having disabled people help in operations is a necessity. Informed by disabled, feminist, and Indigenous philosophy, I use autoethnography to speak about my experience as a disabled museum worker, discuss how disabled people are denied autonomy in our society, the value of the disabled experience, and what it takes to be a supportive employer.

Therapeutic Counseling Needs for Victims of Rape in Rape Prosecution Cases

Student Researcher: Ashling Bowen, M.S. Clinical Rehab & Mental Health Counseling

Faculty Mentor: Dr. Ambrin Masood

This study investigates what specific counseling modalities are utilized by community counseling centers across the Seattle, Washington area when performing counseling treatment for rape victims who are participating in rape prosecution case proceedings. The author identified evidence that these victims are likely to produce symptomology specific and different from rape victims who are not participating in rape prosecution cases, as well as diagnoses more congruent with C-PTSD than PTSD due to constant repeated exposure to further harmful/traumatizing events by way of rape prosecution case proceedings/processes. Results of personal interviews with eight local residents and four separate community counseling centers indicated that 0% of the surveyed community counseling centers reported offering any specific counseling services/methodologies to rape victims who were participants in ongoing rape prosecution case proceedings.

A Snapshot of the Geologic History in Yellowstone National Park

Student Researchers: Gabriel Brooks, A.S. General Education; Brenden Fritzler, B.S. Outdoor Adventure

Leadership; Brooklyn Hammill, B.A. Environmental Studies

Faculty Mentor: Dr. Jacob Thacker

Yellowstone National Park contains a vast geologic history. The park hosts some of the oldest rocks in North America from the Precambrian (4.56 billion years ago to 541 million years ago: mya) that exceed 2.8 billion years old. Paleozoic Era (541–252 mya) rocks contain evidence of early evolution and biodiversification of invertebrates, with later vertebrates and early plants, during episodes of sea level rise and fall when North America was on/near the equator. Mesozoic Era (252–66 mya) rocks have produced large vertebrates like dinosaurs and plesiosaurs and display evidence of events that formed our Rocky Mountains. Cenozoic Era (66 mya–present) rocks display mammal fossils after the dinosaur extinction. The Absaroka Mountains represent 53- to 43-million-year-old stratovolcanoes that are unrelated to the volcanic eruptions that started 2.1 million years ago. Those young caldera-forming eruptions preceded Yellowstone's most recent geological activity, with glacial debris from a large ice cap as young as 15,000 years ago mantling most areas in the park, while ongoing volcanic activity produces world-famous thermal features and occasional hydrothermal explosions.

NCAA Division II Impacts on MSUB

Student Researcher: Mason Brosseau, B.A. Environmental Studies

Mentor: Aaron Schultz

During the early '80s, relations, support, and success altered the direction and brought a new sense of life to Eastern Montana College. Student life and campus culture have revolved around athletics as they have always been the center of EMC/ MSU-B. The athletic department has and will continue to battle through adversity and will continue to come out strong just like before.

Heparin's Effects on the Binding Interaction Strength of B7-H3 and MDK

Student Researcher: Rebecca Chambers, B.S. Biology

Co-Authors: Spencer Walters, B.S. Biology; Sarah Hawkaluk, B.S. Liberal Studies; Gunner Ostrem, B.S. Biology

Faculty Mentor: Dr. Richard Warner

Cancer therapies that re-activate the immune system have been successfully used to treat patients with advanced melanoma. Specifically, immune checkpoint inhibition has aided in blocking immune inhibitory signals with a targeting antibody to an immune receptor. Looking for similar immune signaling targets in melanoma, we previously identified a novel interaction between B7-H3, an immune protein, and midkine (MDK), a soluble growth factor. MDK is already known to be a heparin binding molecule and may have heparin interaction at two or more protein sites. We developed multiple protocols for both the addition and subsequent removal of heparin from cell lysates to observe the effects of heparin on the binding strength for MDK and B7-H3 interaction. We found that heparin at high concentrations did not significantly disrupt the binding interaction between MDK and B7-H3 in cell lysate. Since the heparin doesn't seem to compete with B7H3 for MDK binding, this suggests that B7H3/MDK interaction is not likely to be an artifact of an *in vitro* induced low-heparin condition.

Phylogenetic analysis of chloroplast genomes from monocot and dicot species native to Dover Memorial Park in Yellowstone County, Montana

Student Researcher: Jasmine Cofield, B.S. Biology

Faculty Mentor: Dr. Jason Comer

Prior chloroplast genome research studies raise questions such as: Do chloroplast marker phylogenies mirror nuclear marker phylogenies? Are there structural differences between dicot angiosperm chloroplast markers and monocot chloroplast markers? and What other families are underrepresented in chloroplast research? The goals of this project are to address these outstanding questions by sequencing and assembling chloroplast genomes from both monocot and dicot angiosperms. An additional goal is to target species that have not previously been sequenced for chloroplast assembly. Through long read sequencing and current bioinformatics techniques this study will generate new chloroplast genomes and provide insight into the evolution of the chloroplast.

Antibiotic Resistant Bacteria in Our Water? A Survey of Antibiotic Resistance Genes in the Yellowstone River Adjacent to the City of Billings, MT

Student Researcher: Kaidyn Harris, B.S. Biology

Faculty Mentor: Dr. Jason Comer

Antibiotic resistance genes are genetic elements which allow bacteria to evolve and evade the mechanism of antibiotics. These genetic elements have been found in a variety of aquatic environments, including wastewater treatment plants. The Yellowstone River adjacent to Billings, MT, offers a unique opportunity to study the impact of environmental and industrial contributors to riverine antibiotic resistance gene accumulation. Environmental DNA was collected from the Yellowstone River at Two Moon Park. Following DNA extraction, sequencing was carried out on a MinION Flow Cell and the resulting data was compared to known antibiotic resistance genes. This analysis will provide data on not only the antibiotic resistance genes present in the water, but it will also allow the development of an overall picture of what eDNA is present in the river near this park. Given the sparse public data on the bacterial communities present in the Yellowstone River, this study will provide insight on biodiversity and presence of antibiotic resistance in a crucial local water source.

Investigating ELP3 Levels in an ELP1 Conditional Knockdown Mouse Model of ALS

Student Researcher: Kiana Hawkinson, B.S. Biology

Faculty Mentor: Dr. Lynn George

Mutations in the gene encoding ELP3, the catalytic subunit of a macromolecular complex called Elongator, were found to be associated with Amyotrophic Lateral Sclerosis (ALS). To investigate this connection, the George Lab generated a mouse model in which the scaffolding subunit for the complex is ablated in motor neurons. Our aim is to determine whether ELP3 levels are diminished in this mouse model in addition to ELP1.

Genetic Analysis of a Water Sample from a Natural Water Source in Billings, Montana

Student Researcher: Lucas Hert, B.S. Chemistry

Faculty Mentor: Dr. Jason Comer

River water is rich in several different types of microorganisms, including bacteria, fungi, viruses, and protozoa. Water from different locations contains varying types and amounts of microorganisms depending on the local flora and fauna in the aquatic and surrounding environment. The ability to filter water samples and sequence the DNA of the microorganisms found within the filtrate can reveal not only what microorganisms are present in the water source, but also in what quantities. In this experiment, a sample of water taken from the Yellowstone River in Billings, MT, was filtered, extracted, quantified, and sequenced. The sequencing data was analyzed using Oxford Nanopore EPI2ME software. A BLASTN and TBLASTX similarity search of GenBank databases was performed to identify the genomes present in the sample, with a special focus on viral database queries.

Descendants of Salem: An Examination of the Infamous Colonial Witch Trials

Student Researcher: Samuel Huffard, B.A. History

Faculty Mentor and Co-Author: Dr. Jennifer Lynn

Our research will explore the historical significance of our ancestors' executions at the Salem Witch Trials, who were killed for the crime of witchcraft. This project analyzes the circumstances of the executions and our ancestors' roles in their communities, through incorporating primary and secondary source materials.

A void created but not yet filled – The transition of the Montana Center for Cerebral Palsy and Handicapped Children

Student Researcher: Angelica Lechocinski, B.S. Psychology

Faculty Mentor: Dr. Tom Rust

Through the analysis of student newspapers and articles that emphasized the impact of the nationally recognized, multidisciplinary services that The Montana Center for Cerebral Palsy and Handicapped children (the Center has undergone several name changes over the years) had on various populations, this study explores the reasons why the Center doesn't exist the way it used to, focusing on financial and legislation changes. The loss of quality services and community created by the absence of the program has yet to be filled.

Optimizing FeCl₃-Catalyzed Synthesis of O-Glycosides

Student Researcher: Alyce Lyons, B.A. Biology

Faculty Mentor: Dr. Hashini Herath

This research focuses on optimizing the ferric chloride catalyzed glycosylation of unprotected sugars to produce O-glycosides. Glycosides are biologically and chemically significant molecules used in pharmaceuticals, household products, and therapeutic agents. Developing efficient and sustainable methods for glycoside synthesis offers an alternative to complex and inefficient natural isolation processes.

Local Perceptions of Law Enforcement

Student Researchers: Joshua Mapel, B.S. Criminal Justice; Chance Smith, B.S. Criminal Justice & B.S. Sociology; Annie Trinh, B.S. Sociology & B.S. Human Services

Faculty Mentor: Dr. Stephen Eliason

The goal of this project is to identify the numerous perceptions people may possess about law enforcement, while also looking into the specific events that may have led them to see law enforcement the way they do. We expect to find that some people have excellent perceptions of law enforcement, while others may have the opposite. It is also a great possibility that people are indifferent in regards to law enforcement.

MSU Billings Students' Perception of DUI Enforcement and Deterrence in Montana

Student Researchers: Darby Marney, B.S. Sociology & B.S. Criminal Justice; Kenneth Noll, B.S. Criminal Justice; Tatum York-Bement, B.S. Criminal Justice; Chenoa Louie, B.S. Criminal Justice

Faculty Mentor: Dr. Stephen Eliason

We are researching how MSU Billings students perceive the effectiveness of enforcement and deterrence strategies aimed at reducing DUI incidents in Montana. Understanding public perception is critical because people's views on the effectiveness of DUI laws and enforcement directly influence their behavior. The research method that we used was primary-quantitative data. Surveys were administered to MSU-Billings students to get their perception on the effectiveness of Montana DUI laws.

Caricatures of Early Soviet Leaders: Power and Fear

Student Researcher: Simon McGuire, B.A. History

Faculty Mentor: Dr. Jennifer Lynn

This project seeks to shed light on the recently discovered caricatures of early Soviet leaders, which were created during meetings that Stalin and Lenin held with their henchmen. These drawings were created by some of the most high-ranking Bolshevik and Soviet members; many of those who were portrayed were later killed, and the creators of these caricatures would meet the same fate. These caricatures are often funny but also dark, as they reveal the power struggles of the early Bolshevik leaders of the Soviet party. These caricatures can demonstrate the power struggle and representations of power through private imagery, while also shedding light on the grim and dark realities of the leaders of the early Soviet Union. It will also give an insight into the mindsets of the leaders, including the opinions and views that they had of each other.

Ireland Fairy Folk Then and Now: British imperialism and Ireland's Independence

Student Researcher: Lori Moss, B.A. History Education

Faculty Mentor: Dr. Jennifer Lynn

This project analyzes how the political and social changes in Ireland shape the depiction of fairies. I will discuss the importance of fairies and Ireland culture while placing its significance in a historical context. I will explain how British imperialization changed the depiction of fairies from pagan representations to a Christian narrative. I will analyze how Irish nationalists utilized the Pagan revival to resurrect the original pagan representation of fairies. I argue that this revival was utilized to resist the British crown as well as helped the Irish rediscover their culture. To prove this argument, I will utilize and analyze the themes of oral traditions surrounding fairies. I will also discuss how social challenges threatened the preservation of Ireland fairies.

Rebels Without a Cause: A Microhistory of Eastern Montana college and the Red Lodge Riots

Student Researcher: Lori Moss, B.A. History Education

Faculty Mentor: Dr. Tom Rust

This project analyzes the 1965 and 1966 Red Lodge riots that involved Eastern Montana College (EMC) students. The riots reveal a different side to the counterculture of the 1960s that has not been studied by historians. The Red Lodge disturbances and the community's response demonstrate the Cold War implications, youth contempt for authority, and a generational gap. This research provides context to the resort riots of the early to mid-sixties and reveals elements of class, gender, and privilege.

The Social Conflict: Witchcraft in Lorraine, France, 1570-1650

Student Researcher: RoseLynn Olson, B.A. History

Faculty Mentor: Dr. Jennifer Lynn

In a sample of the witch trials from Lorraine, France, between 1570-1650, patterns and similarities within the accusations, interrogations, and confessions highlight how much social factors influenced the way the witch craze was shaped. This project addresses the following questions: what were the witch trials like in France? Looking at the trials in Lorraine as a case study, what do they reveal about the witch craze? What do individual confessions in Lorraine inform us about the social aspect of witch trials? This project utilizes transcripts from the trials to highlight the significance of gossip, stories, word of mouth, and public executions and how unique patterns emerged.

Mutating a Soluble B7H3 Gene and Comparison to sB7H3/MDK Protein Interaction

Student Researcher: Gunner Ostrem, B.S. Biology

Co-Authors: Rebecca Chambers, B.S. Biology; Sarah Hawkaluk, B.S. Liberal Studies; Morgan Russell, B.S. Biology; Spencer Walters, B.S. Biology

Faculty Mentor: Dr. Richard Warner

Immune system re-activation in advanced melanoma patients can be achieved through immunotherapies, and immune checkpoint inhibition therapy is new breaking ground. Previously, we discerned a novel interaction between B7-H3, an immune protein, and the ligand protein, midkine (MDK). To probe the strength of this interaction and disrupt it, we designed a strategy with several mutations to a solubilized B7-H3 to alter its ability to interact with MDK as measured in a Protein Complementation Assay (PCA) system. Specifically, polar amino acids (aspartic and glutamic acid residues) were targeted due to the potential role these residues may have for B7-H3 binding via positively charged residues on MDK. Amino acids around three aspartic acids have been focused on specifically D84, D116, and D128. Targeted amino acids were mutated to alanines via mutagenesis PCR and correct changes were verified by sequencing. Fresh plasmid preps of mutated and normal B7-H3 were co-transfected into HEK293FT cells with MDK. After 24 hours, PCA measurements were made on whole-cell lysates by luminescence of the reporter. Comparison of interaction signal strength from mutants to normal B7-H3 interaction signal identified at least one critical site involved in MDK interaction. Two acidic amino acids (D116 and E117) were identified as critical, as mutation to alanine caused a drop of 70% on average in the protein interaction signal.

Regulation of Autophagy Protein Expression in Neutrophils during *S. aureus* interaction

Student Researcher: Teagan Potter, B.S. Biology

Faculty Mentor: Dr. Madison Collins

Staphylococcus aureus (*S. aureus*) is a gram-positive bacterium that naturally colonizes the skin and nasal passages. While often harmless, it can become a serious pathogen, causing infections with high morbidity and mortality. Previous work has shown that *S. aureus* without the SaeR/S gene regulatory complex is not as virulent both in vivo and in vitro. Recent research shows that the upstream accessory genes to *saeR/S* (*saeP* and *saeQ*) function to negatively regulate SaeR/S-mediated virulence gene expression. We have been utilizing western blots to identify and quantify autophagy proteins LC3 and p62 in neutrophils after interacting with wildtype and mutants deficient in SaeR/S, SaeP, and SaeQ, respectively (Δ *saeR/S*, Δ *saeP*, Δ *saeQ*). Early experiments suggest that neutrophils that phagocytose Δ *saeR/S* and Δ *saeQ* may have more expression of these autophagy proteins. These early data indicate that autophagy may function in neutrophils more efficiently during interaction with the mutants relative to wildtype. With this work and other work ongoing, the role and impact of SaeP and SaeQ may begin to be understood during the early stages of infection.

Parasites in the Yellowstone River

Student Researcher: Nikola Sladic, B.S. Biology

Faculty Mentor: Dr. Jason Comer

Given the significance of the Yellowstone River for local communities, an efficient monitoring system should be put in place to analyze the prevalence of aquatic pathogenic species such as parasites. Environmental DNA (eDNA) is an efficient way to assess biodiversity, one aspect of water quality. The methodology used in this study follows a standard eDNA analysis procedure of sampling, filtering, DNA extraction, library preparation, and sequencing. The sequenced data was used to perform a BLASTn search using the NCBI database to identify the taxonomic biodiversity of parasites. The data generated in the study serves as a point-in-time analysis of the current biodiversity and abundance of parasites in the Yellowstone River but can also be used to monitor the change in qualitative and quantitative aspects for future studies.

Evolution of views towards Native Americans through changes in monuments

Student Researcher: Braden Stone, B.A. History

Faculty Mentor: Dr. Cody Patton

This research explores the evolving views of the United States Government and EuroAmericans towards the native populations in Montana from 1876-2000. The research is guided by changes related to the Little Bighorn Battlefield Monument, answering the research question: How can changes in the Little Bighorn Battlefield Monument show us the shift of viewpoints towards the Native communities in Montana?

Five Mile Creek: A New Territory for Brucellosis?

Student Researcher: Danara Tulimaiau, B.S. Biology

Faculty Mentor: Dr. Jason Comer

Brucellosis, a highly contagious bacterial disease, is caused by a group of bacteria in the genus *Brucella* and is capable of infecting a variety of animals. In the U.S, the Greater Yellowstone Ecosystem (GYE) is one of the only places known to contain this disease, mainly infecting cattle, elk, and bison. This study will assess overall biodiversity, but mainly focuses on using environmental DNA extracted from soil collected along Five Mile Creek (Billings, MT) and bioinformatic analyses to screen for *Brucella* bacteria. This work is important for expanding environmental studies outside the GYE, as well as understanding the spread of *Brucella* bacteria.

Titin... a Novel Nucleolar Protein in Neurons

Student Researcher: Danara Tulimaiau, B.S. Biology

Faculty Mentor: Dr. Lynn George

Titin has been well characterized for its function in the muscle sarcomere. The George Lab has discovered a novel Titin isoform that is present in the nucleolus of neurons including diverse neuronal and glial subtypes in both central and peripheral nervous systems. Based on the Titin motifs that are present in this novel isoform, our hypothesis is that neuronal titin functions in liquid-liquid phase separation and the formation of the neuron nucleolus.

DNA: It's in the Water

Student Researcher: Nickolas Ullman, B.S. Biology & B.S. Chemistry

Faculty Mentor: Dr. Jason Comer

Due to the low population, few DNA sequencing studies have been performed analyzing various environmental populations in Montana. In this study investigating the biodiversity in lakes connected to the Yellowstone River, DNA samples were collected from Lake Josephine in Billings, MT. A DNA extraction was performed, DNA quantity and quality was checked with a Nanodrop, and the DNA was sequenced using a Nanopore DNA sequencer. Finally, a metagenomic analysis was performed to identify the organisms present in our sample using Genius Prime. This study will allow for the construction of a phylogenetic tree for the DNA present in the water sample as well as giving better insight into the biodiversity of Lake Josephine. Data will also be separated into domain, kingdom, and species where applicable.

Navigating Treatment Paradigms: Harm-Reduction versus Abstinence in Substance Use Disorder Treatment in Helena, MT

Student Researcher: Michelle Anne vanderMars, M.S. Clinical Rehab and Mental Health Counseling

Faculty Mentor: Dr. Ambrin Masood

This paper studies the efficacy of substance use disorder treatment methodologies, a harm-reduction approach vs. an abstinence-only approach, in the area of Helena, MT. The abstinence-only model is based on the ideologies developed in the 1930s by the Alcoholics Anonymous model, which uses a disease model for treating substance use disorders. In contrast, the harm-reduction model, a more contemporary approach, focuses on reducing substance use and minimizing its negative consequences. This model includes evidence-based interventions, such as medication-assisted treatment. This paper will detail the results which conclude that abstinence-based treatment works for some but not all, and the future implications for both treatments.

Comparative Analysis of Two *Convolvulus arvensis* (Field Bindweed) Populations Using Whole Plastome Data

Student Researcher: Hayden Walker, B.A. Biology

Faculty Mentor: Dr. Jason Comer

Convolvulus arvensis L., commonly known as field bindweed, is a noxious weed that occupies temperate habitats, disrupts ecosystems, and reduces crop yield by an estimated \$377 million per year among the most severely affected states. Despite the significant impact of *C. arvensis*, research has been limited, especially genomic studies. In order to better understand the genomics of *C. arvensis*, this study aims to use the chloroplast genome of two geographically distant populations with different water availability for phylogenomic comparisons. This preliminary work will be used to inform future studies of *C. arvensis*. The primary objectives of this study were to sequence multiple chloroplast genomes, identify genetic differences between individuals, and construct a phylogeny of both populations.

Testing Proliferation Effects in Melanoma Cell Lines Exposed to B7-H3 & Midkine Proteins

Student Researcher: Spencer Walters, B.S. Biology

Co-Authors: Rebecca Chambers, B.S. Biology; Sarah Hawkaluk, B.S. Liberal Studies; Morgan Russell, B.S. Biology; Gunner Ostrem, B.S. Biology

Faculty Mentor: Dr. Richard Warner

Our project focuses on mapping the interaction of two cancer-associated molecules: B7- homolog-3 (B7-H3) and Midkine (MDK), which we are characterizing as a novel interaction between two proteins with high expression in multiple cancers. Our first goal is to survey a series of human melanoma cell lines by Western blot analysis to determine the levels of B7-H3 and MDK proteins expressed. B7-H3 is an immune checkpoint protein, and MDK is a secreted growth factor; our work is unique in examining these together in melanoma. Presence of B7-H3, MDK and GAPDH (as protein loading control) was confirmed by Western blot method in 8 different melanoma cell lines. We intend to conduct proliferation assays on cancer cells based on these protein expression profiles and determine if MDK interaction with B7-H3-high cancer cells induces any proliferative effects. Included in our study was a comparison of cell morphology based on growth media for the SK MEL 28 melanoma line.

Characterizing the impact of SaeP/Q in *Staphylococcus aureus* on human blood survival

Student Researcher: Cahl Yetta, A.S. Nursing

Faculty Mentor: Dr. Madison Collins

Methicillin-resistant *Staphylococcus aureus* (MRSA) is a dominant pathogen that can evade normal immune defenses, causing serious septicemic infections, and is a leading cause of antibiotic-resistant infections. The signaling response of MRSA is not well understood. We suspect that the SaePQRS system is involved, based on previous work that has shown that MRSA uses the SaePQRS gene regulatory complex, SaeR/S, to regulate virulence genes that play a role in infection. Additionally, evidence suggests that SaePQ are accessories to SaeR/S, although their function is not well understood. Our goal is to better understand the role of SaePQ during blood challenge. Using an established heparinized whole blood survival assay, we have compared the rate of survival of SaeP/Q deletion mutants (Δ saeP, Δ saeQ) to wild-type (USA300). Using human blood agar plates, we measured the amount that Sae deletion mutants hemolyzed red blood cells compared to wild type. This data will expand our understanding of how SaePQ impacts blood survival, regulates hemolysins, and ultimately how MRSA affects sepsis patients in a clinical setting.



2025 MSU BILLINGS JURIED STUDENT EXHIBITION



Grace Bittner

The Greatest Sacrifice

Wood burned on a pine with acrylic paint , rope, stain, and rusty nail nailed into pine. 9 by 15



Lisa Blomquist

Cross Pollination - A Love Story

Animation Video/The Actors - Collage/Ink/Acrylic.
Video - 01:27 Minutes/The Actors - 13" X 15"



Lisa Blomquist

Portal

Sculpture - Wood, Watercolor, Encaustic, Oil Stick, Metal, Acrylic. 9" X 21"



Jayden Criddle

Dragon Vine Vase

Clay. 16"



Chris Eberly
Unclear imagination
Clay. 20"



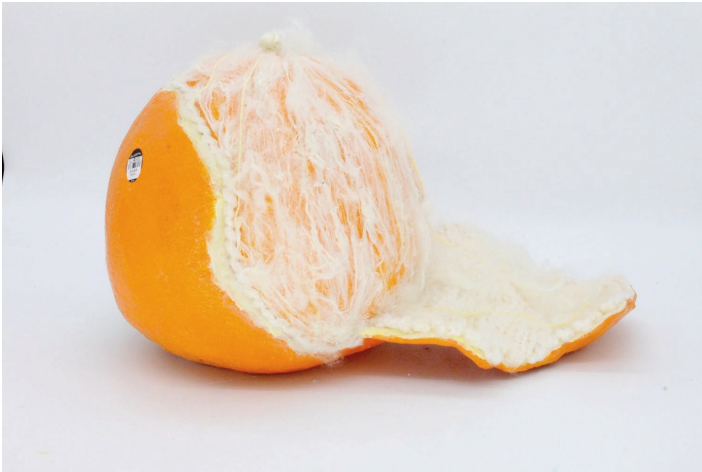
Chris Eberly
Heavy thoughts
Acrylic/skateboard. 30" by 9"



Chris Eberly
Skateboard console
Recycled skateboards, reds oak. 50" w 16" thick 36" tall



Clara Eggemeyer
Little Fishy
Ceramic. 12"x 19"x 24"



Taya Falcon

Citrus Rot

Mixed Media, Ceramic, Yarn, Flocking. 10inx14in



Taya Falcon

Elk Tooth Pot

Mixed Media, Ceramic, Imitation Elk Teeth. 7in x7in



Taya Falcon

Mostos Herd

Alder wood, acrylic wash and Teak Oil. Longest: 8 ft,
Shortest: 4ftx8in tall



Arbor Grayson

3 Ghosts

Collage. 2d

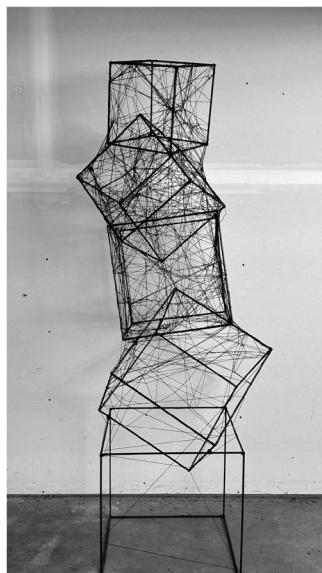
2025 MSU BILLINGS STUDENT JURIED EXHIBITION



Arbor Grayson

Lost Dreams

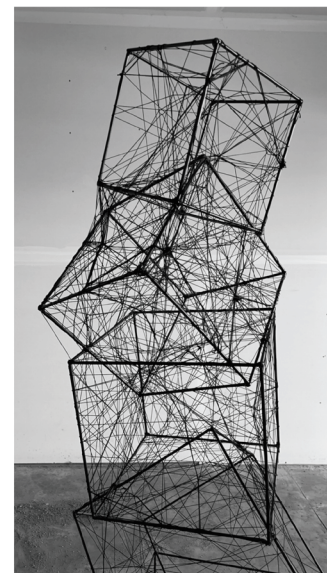
Gouache and Copic Markers. 2d



Hadassah Harris

Untitled

1/4" round steel rod, spray paint, and string. Approx 5'10



Karmen Joki

Ecodormancy

Graphite on lenox paper and acrylic marker on mylar. 30x47inches



Karmen Joki

Fluvial and "Saphrophagous"

Oil on canvas. 20x41 inches



Sophia Linster
Rosie
 Acrylic. 16x20in



Kaylin Millsap
In Hot Water
 Water heater, steel, porcelain, glaze. 78" x 19" x 19"

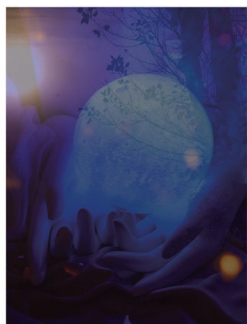
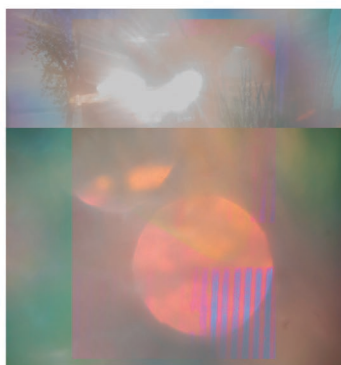


Holden Musso
Reluctant Maturity
 Archival Pigment Prints. 15 x 22



Holden Musso
Untitled
 Archival Pigment Print. 8.5 x 11

2025 MSU BILLINGS STUDENT JURIED EXHIBITION



Tayler Newman
Dissected Reverence
Photography. 22 x 16.5

Madelein Owen
Wong Baker Rolling Idol Fanzine
Mixed. 4'x1'



Isac Pratt
Dinner at the Arnazes
Ink and Printmaking Paper. 55x12.2

Madelyn Smith
Self Portrait with my Toothbrush
Oil on Canvas. 44in x 30in



LeiyahDawn Spotted Elk

Natures Path

Ceramic. 15" x 27"



Kai Sutton

Starlings

Paper. 3D



Shaylee Syring

Nonconsensual Performance

Archival pigment print. Image Unframed



Emily Tiry

The Walls are Watching

Oil Paint. 40in x 40in



Natalie Wells

Sam

India Ink. 9x12



Magnolia West

the earth is spinning

video and audio. projection

Thank You to Our Research & Creativity Symposium Judges

Dr. David Butler, Professor, Biological and Physical Sciences

Dr. Madison Collins, Assistant Professor, Biological and Physical Sciences

Daniel Funderhide, Access Services Librarian, Library

Bryan Grove, Assistant Director, Advising

Hannah O'Donnell, Specialist, Assessment and Accreditation

Natalie Preston, Executive Assistant to the Chancellor

David Russell, Instructor, Biological & Physical Sciences

Nathan Sonnenschein, User Services & Experience Librarian, Library

Erika Sturn, Chemical Safety Officer, Biological & Physical Sciences

Kathleen Thatcher, Director, Assessment and Accreditation

Zack Thatcher, Program Coordinator, College of Liberal Arts & Social

Sciences Dr. Amber West Martin, Director, Academic Support Center

Special Thanks & Appreciation

Interim Provost Dr. Richard Beer
Dr. Kurt Toenjes and Dr. Susan Gilbertz – Award Presentation
Shalese Gentry – Keynote Speaker
Patrick Williams – Multimedia Designer
Robin Earles – Art Gallery Director
SUB staff – Event Setup and Coordination
IT staff – Poster Printing and Sound/Tech

Jenay Cross – Research Symposium Manager
Carsyn Patton – Research Symposium Committee
Cindy Bell – Research Symposium Committee

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