

UNDERGRADUATE RESEARCH SYMPOSIUM SPRING 2024

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University of Utah
Salt Lake City



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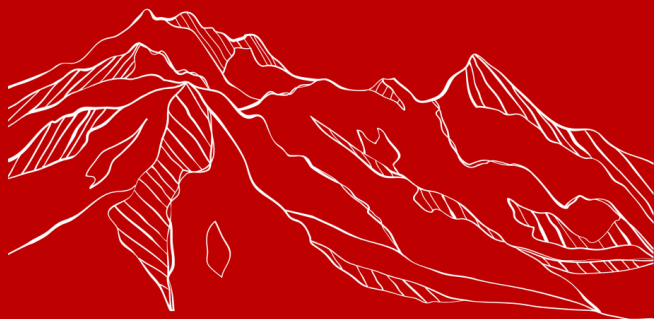
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OVERVIEW



UNDERGRADUATE RESEARCH SYMPOSIUM

APRIL 9, 2024
9:00AM - 2:30PM
UNION BALLROOM



Every semester, the Office of Undergraduate Research hosts the Undergraduate Research Symposia (URS). URS provides an opportunity for University of Utah students to present their work in a scholarly setting to students, faculty, and other members of the U community. Undergraduate students from all disciplines at the

University of Utah are invited to present their research and creative work.

Spring symposia are open to in-person poster presentations, oral presentations, and creative presentations. To learn more visit: <https://our.utah.edu/urs>

This year's conference takes place April 9, 2024, 9AM – 2:30PM at the University of Utah in the Student Union.

Special thanks to maschoff brennan and Northrop Grumman for sponsoring the 2024 conference as our Bronze sponsors.

PART I

**SESSION I -
9:00AM-10:30AM**

1.

POSTER PRESENTATIONS

9AM - 10:30AM

Maximizing Impact: Addressing Skin Penetration Challenges of Antiseptic Products for Infection Prevention

Presenter Name: Porter Stulce

Every year, 0.8-2 million patients contract a surgical site infection (SSI), increasing patient mortality 2-11 fold. SSIs are caused by an individual's own skin bacteria. Hospitals use chlorohexidine gluconate (CHG) products, like CHG IV port and wound dressings that release CHG into the skin via diffusion. We hypothesized that the quantity of CHG released from antimicrobial products would determine the product's effectiveness in reducing skin bacteria. We tested our hypothesis using a pig model

Presentation #A1

College: Engineering

School / Department: Bioengineering

Email: u1270386@utah.edu

Research Mentor: Dustin Williams

Damage Properties of Tendons Crosslinked with Genipin

Presenter Name: Madeline Wagner

The mechanical properties were measured for normal and chemically crosslinked collagen tendon structures. The mechanical properties of crosslinked and non-crosslinked tendons provide a greater understanding of collagen damage modes in collagen structures and connective tissues.

Presentation #A2

College: Engineering

School / Department: Bioengineering

Email: u1218374@utah.edu

Research Mentor: Jeffrey Weiss

Soft lithography fabrication of refractive index-matched hydrogel microdevices for cell culture assays

Presenter Name: Jennafer Marsh

Evaluating the refractive index-matching of hydrogel mixtures used to fabricate microdevices. The microdevices are used to trap single cells so their growth may be measured via quantitative phase imaging. The hydrogel microdevices must match the refractive index of water

as closely as possible in order to not interfere with data collected using the quantitative phase imaging.

Presentation #A3

College: Engineering

School / Department: Chemical Engineering

Email: jennafer.marsh@utah.edu

Research Mentor: Thomas Zangle

LED Array Microscope for 3D Refractive Index Imaging

Presenter Name: Rob Lindemann

My research focuses on building, programming, and verifying the use of an LED array microscope for 3D refractive index imaging. So far, I have built the LED array microscope and programmed it to take images under the LED illumination patterns necessary for 3D RI retrieval and several other microscopy techniques, including 2D QPM, brightfield, and darkfield. Currently, I am working on capturing images suitable for the 3D RI retrieval algorithm. A potential application is biological imaging.

Presentation #A4

College: Engineering

School / Department: Chemical Engineering

Email: u1242774@utah.edu

Research Mentor: Thomas Zangle

Synthesis of Biohybrid Neural Implant

Presenter Name: Sanjana Aujla

The goal of this work is to alter and create a bio hybrid

design to construct a functioning neural implant. Because of its biohybrid design, the neural implant is anticipated to greatly reduce the risk of foreign body reactions, including long-term inflammation, bioencapsulation, and electrode corrosion. These electrodes are expected to create synaptic connections for electrical activation and output after passing through axons and into the brain.

Presentation #A5

College: Engineering

School / Department: Electrical and Computer Engineering

Email: u1243570@utah.edu

Research Mentor: Simon Binder

Investigation of Polymer Functional Groups and Their Impact on Sperm Viability

Presenter Name: Halli Thompson

The accuracy of sperm viability assessments is essential for informed decisions regarding reproductive health. The impact of lab materials on sperm cell motility remains understudied. Bioassays of sperm motility on lab materials were conducted to determine unusual decline trends. SEM/EDS images were captured to determine potential contaminants within the lab materials. FTIR peaks were analyzed to determine functional groups present. All data is analyzed for potential effect on motility.

Presentation #A6

College: Engineering

School / Department: Materials Science and

Engineering

Email: u1289925@utah.edu

Research Mentor: Jeff Bates

Mapping the relationship between Tip-to-Collector Distance and Electrical Current in Near-Field Electrospinning

Presenter Name: John Chae

Dynamically control tip-to-collector distance to observe current behavior during near-field electrospinning.

Presentation #A7

College: Engineering

School / Department: Mechanical Engineering

Email: u1285738@utah.edu

Research Mentor: Jiyoung Chang

Piezoelectric vibration sensor for high frequency application

Presenter Name: Kibin Park

With the ongoing advancements in the aviation industry, the issue of cutting tool wear remains a significant concern, particularly in the manufacturing of difficult-to-cut materials. In practice, tools are changed more often than necessary due to the unknown state of actual tool wear. In this work, we will be implementing near-field electrospinning method to print micro/nanofibers of Polyvinylidene fluoride (PVDF) to fabricate a piezoelectric vibration sensor. There are various crystalline phase

Presentation #A8

College: Engineering

School / Department: Mechanical Engineering

Email: u1378955@uemail.utah.edu

Research Mentor: Jiyoung Chang

Interpreting Graph Drawing with Multi-Agent Reinforcement Learning

Presenter Name: Seth Doubek

Using Q-Learning, this project aims to implement multi-agent reinforcement learning to the domain of drawing aesthetic node-link diagrams

Presentation #A9

College: Engineering

School / Department: School of Computing

Email: u1285625@utah.edu

Research Mentor: Daniel Brown

“Barely-SSM”: Weakly Supervised Statistical Shape Modeling for Anatomical Shape Representation

Presenter Name: Asma Khan

We propose to study statistical shape modeling (SSM) for anatomical shape representation via unsupervised and weakly supervised methods, referred to as “Barely-SSM”. This research aims to develop a novel approach to segmenting medical volumes that eliminates the need for burdensome manual annotations, followed by an evaluation of the applicability of this segmentation for SSM. The research focuses on addressing the concrete and important challenge of improving the efficiency.

Presentation #A10

College: Engineering

School / Department: School of Computing

Email: u6011009@utah.edu

Research Mentor: Shireen Elhabian

The Effects of Microbiota Dependent Regs on Beta-Cell Proliferation

Presenter Name: Halli Baird

This project seeks further our understanding of the role of Reg expression in the neonatal pancreas. Using a Reg3 KO mouse model, we can determine whether the presence of Regs is necessary for neonatal beta-cell proliferation, and whether it is dependent upon microbial signals. The presence of Enterococcus, Candida dubliniensis, and Escherichia in mice have been shown to rescue beta-cell mass in mice. My project explores whether individual microbes promote beta-cells through Reg3 expression.

Presentation #A11

College: Science

School / Department: Biological Sciences

Email: u1334768@utah.edu

Research Mentor: June Round

Rethinking Resilience: Testing Tolerance in Drosophila

Presenter Name: Sarah Crago

To test how different species respond to climate change, I compared tolerances to food and water deprivation,

ethanol, and heat in *Drosophila pseudoobscura* and *Drosophila persimilis*- sister species living in the American West- to that of *Drosophila melanogaster* and *Drosophila simulans*- sister cosmopolitan species. In most conditions, sister species followed the similar patterns, suggesting that evolutionary history and ecology may indicate species' resilience to climate change.

Presentation #A12

College: Science

School / Department: Biological Sciences

Email: u1243675@utah.edu

Research Mentor: Sophie Caron

Does the over-expression of LRRC1 correlate with melanoma growth?

Presenter Name: Kylee Fernandez

We inserted the gene LRRC1 into a cell and the cell proliferated more than the control.

Presentation #A13

College: Science

School / Department: Biological Sciences

Email: kyleefernandez@gmail.com

Research Mentor: Gennie Parkman

Investigating conopeptides targeting voltage-gated potassium channels

Presenter Names: Shannon Anderson and Merrin Maughan

This work is focused on the effects of conotoxins on

homomeric Kv1.2 channels, and how beta subunits impact the biophysical properties of KV1.2. Mu3.1, a conotoxin isolated from *Conus mucronatus*, was tested on isolated *Xenopus* oocytes (expressing human Kv1.2). Using a two-electrode voltage clamp technique, we observed that Mu3.1 blocks the outward K-currents from homomeric Kv1.2 channels. To study K-channels, we use conotoxins (neuroactive peptides isolated from the venom of marine cone snails).

Presentation #A14

College: Science

School / Department: Biological Sciences

Email: shannon.anderson@utah.edu

Research Mentor: Shrinivasan Raghuraman

Improving access to naloxone and opioid resources through the emergency department

Presenter Name: Mia Sheneman

Presentation description

Research looking to answer if the University of Utah ED is a good place for naloxone resources and education to be administered. This is an observational study with a 30-40 day followup phone-call.

Presentation #A15

College: Science

School / Department: Biological Sciences

Email: u1470305@utah.edu

Research Mentor: Kate Flynn

Using Snapshot camera trap data to evaluate the extent of the 'weekend effect' across varying climatic regions of the contiguous United States.

Presenter Name: Gaby Karakcheyeva

In this study, we will use data from a large-scale citizen science camera trapping project to assess whether periodic increases in human recreational activity paired with varying climates will elicit behavioral responses across multiple mammal species in northern Utah, U.S.A. Specifically, we will assess whether increases in human recreational activity during the weekend affected mammalian temporal activity patterns at the community-wide and species-specific level, considering climate.

Presentation #A16

College: Science

School / Department: Biological Sciences

Email: u1402946@utah.edu

Research Mentor: Austin Green

Capsid formation of dArc in the Drosophila melanogaster brain for Intercellular Signaling

Presenter Name: Sydney Skousen

The Activity-regulated cytoskeleton-associated protein (Arc) is related to retrotransposon Gag proteins and has important roles in neuronal signaling, synaptic plasticity, and memory consolidation. This project aims to investigate the capsid formation of dArc in the Drosophila melanogaster brain for intercellular signaling. Following an immunohistochemistry staining and confocal

microscopy protocol, the differences in dArc expression can be analyzed between wild-type and capsid mutant flies.

Presentation #A17

College: Science

School / Department: Biological Sciences

Email: u1280893@utah.edu

Research Mentor: Sophie Caron

**Using Electroabsorption to determine
optoelectronic properties of PM6:Y6 blends**

Presenter Name: Zhuyun Xie

Organic solar cells offer a promising solution to meet rising energy demands due to their flexibility, lightweight design, non-toxicity, and cost-effectiveness, presenting compelling alternatives to traditional inorganic technologies. The purpose of this research is to use Electroabsorption (EA) to determine the optoelectronic properties of PM6, Y6 and their blends. The dipole moment and polarization of the material was also calculated in this research.

Presentation Type: Poster

Presentation Format: In Person

Presentation #A18

College: Science

School / Department: Chemistry

Email: u1344442@utah.edu

Research Mentor: Luisa Whittaker-Brooks

How Comfortability with Professor Affects Students' Perception of belonging

Presenter Name: Bricia Hendry and Kass Johnson

This research examines the belonging of students in General Chemistry 1 and Organic Chemistry 2. The students completed a course level belonging survey. Our Group is studying students' open-ended responses explaining their level of comfortability with their instructor. We have been developing categories using themes that emerged from the student responses. In this poster, we will describe the categories, definitions, and example quotes.

Presentation #A19

College: Science

School / Department: Chemistry

Email: u1410570@utah.edu

Research Mentor: Regina Frey

Deaminative contraction chemistry for the synthesis of [2.2]paracyclophane and asymmetric derivatives

Presenter Name: Ali Nopper

Cyclophane motifs present in natural products, pharmaceuticals, and asymmetric ligands (e.g., Phanephos), are structurally intriguing and important, yet

can be challenging to prepare. Recently, the Roberts group developed a strategy to build polycyclic (hetero)aromatics from simple to prepare tertiary amines. The tertiary amine templates are processed into polycyclic (hetero)aromatics using developed reductive cyclization and deaminative contraction methods.

Presentation Type: Poster

Presentation Format: In Person

Presentation #A20

College: Science

School / Department: Chemistry

Email: u1345499@utah.edu

Research Mentor: Andrew Roberts

Controlling Phase Transitions in Lead-free 2D Metal Halide Perovskites

Presenter Name: Emily Dalley

2D metal halide perovskites are an exciting material because of their photovoltaic and thermal properties. We focus on the thermal properties of copper-based perovskites and their barocaloric cooling capabilities, which stem from their ability to undergo solid-solid phase transitions. We have been working to fine-tune this phase transition by blending organic cation chains and halide anions.

Presentation #A21

College: Science

School / Department: Chemistry

Email: u1356464@utah.edu

Research Mentor: Connor Bischak

Tuning phase transitions in lead-free 2-d perovskites

Presenter Name: Leo Bloxham

Perovskites are exciting materials that are the focus of current research due to some of their promising applications in solar cell and thermal storage technologies. The objective of my research is to synthesize and characterized manganese and copper based perovskites and characterize how their solid-solid phase transitions are affected by alloying different organic cations and different metal cations.

Presentation #A22

College: Science

School / Department: Chemistry

Email: u1258164@utah.edu

Research Mentor: Connor Bischak

Star Tracking with Telescope Array Fluorescence Detectors to Investigate Atmospheric Effects on Starlight Signal Intensity Decay

Presenter Name: Jakub Ziembicki

I am working with Dr. Douglas Bergman and the Cosmic Ray Group at the University of Utah Department of Physics and Astronomy. We are computationally tracking stars across the sky using data from Telescope Array, a cosmic ray detector in Delta, UT. We are using the

program to extract starlight intensity decay data from many stars. We are most interested in the trends that these intensities follow as stars move toward the horizon, which we hypothesize will depend on atmospheric aerosols.

Presentation #A23

College: Science

School / Department: Physics & Astronomy

Email: u1327784@utah.edu

Research Mentor: Douglas Bergman

Climate Vulnerability Assessment of the Great Salt Lake on Migration Patterns

Presenter Name: Zoe Exelbert

My research focuses on 2 species of birds that are extremely ecologically reliant on the GSL, and how they respond to climatic shifts at the GSL. In using citizen science data from eBird, I've been able to model the population distributions of these species over the past 20 years, and understand how climate variables, such as precipitation and sea surface temperature, play a role along their migration route in affecting their population counts at the GSL each Spring.

Presentation #A24

College: Mines & Earth Sciences

School / Department: Atmospheric Sciences

Email: u1355256@umail.utah.edu

Research Mentor: Courtenay Strong

Fate of recycled material in the mantle during decompression melting.

Presenter Name: Constance Sauve

This research project will reproduce pressure and temperature conditions found at mid-ocean ridges, tectonic plate regions that diverge and generate decompression melting, which play a critical role in the formation of magma in the Earth's mantle. I aim to recreate the decompression melting of a heterogeneous mantle to determine the conditions for the melts derived from recycled material to reach the surface without being in full re-equilibration with the surrounding mantle.

Presentation #A25

College: Mines & Earth Sciences

School / Department: Geology and Geophysics

Email: u1405037@uemail.utah.edu

Research Mentor: Sarah Lambart

Impact of Whey Protein Supplementation on Body Composition and Athletic Performance in High School Soccer Players

Presenter Name: Isaac Ou

Whey protein is commonly used to improve athletic performance and body composition. Our study assessed the impact of a whey protein supplement on performance and body composition in adolescent soccer players. Participant's consumed their supplement during the 10-week season, and athletic performance and body composition were measured before and after the season.

Overall, there were no significant changes to performance and body composition between groups.

Presentation #A26

College: Health

School / Department: Health, Kinesiology, and Recreation

Email: u1329429@utah.edu

Research Mentor: Tanya Halliday

Exercise and Inhibition in Deep Brain Regions

Presenter Name: Haley Blomquist

Research shows that physical exercise can help in learning and memory. Yet, it is hard to access those deeper brain regions like the hippocampus and striatum. Using MRS, our team has focused on these specific parts of the brain to determine a proof of concept. There is also a blood-biomarker component, that is correlated to the inhibitory transmitter GABA. Using a HIIT (high-intensity interval training) workout, we were able to analyze what happens to those specific regions in the brain.

Presentation #A27

College: Health

School / Department: Health, Kinesiology, and Recreation

Email: u1372433@uemail.utah.edu

Research Mentor: Bradley King

Effect of Increased Sleep Duration on Insulin Sensitivity and Sleep Regularity in Individuals with Habitual Short Sleep Duration (HSSD)

Presenter Name: Elly LaMonte

As the field of sleep research grows, the correlation between adequate sleep and health conditions becomes more apparent. While the majority of research in this field has focused on sleep duration, recent studies have stressed the importance of sleep regularity when it comes to the development of chronic diseases, including diabetes. This study investigates the effect of increased sleep duration on insulin sensitivity and sleep regularity in individuals with habitual short sleep duration (HSSD).

Presentation #A28

College: Health

School / Department: Health, Kinesiology, and Recreation

Email: u1354454@utah.edu

Research Mentor: Christopher Depner

Effect of Acute Exercise on Brain GABA levels & Blood Biomarkers of Neuroplasticity

Presenter Name: Nanci Delacruz

The study explores the effects of acute exercise on in-vivo brain GABA levels and neural plasticity biomarkers. GABA will be measured using magnetic resonance spectroscopy (MRS) of deep brain regions. Neural plasticity biomarkers will be examined in blood plasma. Results show that acute exercise raised heart rate compared to control

intervention in all eight participants. Further data analysis is expected to show that exercise affects the level of GABA and neural plasticity blood biomarkers.

Presentation #A29

College: Health

School / Department: Health, Kinesiology, and Recreation

Email: u1345833@utah.edu

Research Mentor: Genevieve Albouy

Investigating the Impact of a Ketogenic Diet: Effects on Food Intake and Body Composition

Presenter Name: Faith Smart

The ketogenic diet is based on the theory that consuming high-fat and low-carbohydrate foods will increase feelings of fullness and decrease appetite, ultimately leading to weight loss. My research focuses on studying the effects of this diet on food intake and body weight by comparing it to four other control diets in male C57BL/6 mice over eight weeks.

Presentation #A30

College: Health

School / Department: Nutrition and Integrative Physiology

Email: smartfaith2@gmail.com

Research Mentor: Amanda Bakian

The Validity of the OneStep Smartphone Application Under Various Gate Conditions in Healthy Older Adults

Presenter Name: Chance Deschamps-Prescott

Gait dysfunction is common in older adults and associated with declines in greater physical function and can result in falls and injuries, beginning a harmful cycle of functional deterioration. Motion capture analysis, the premier technique of gait dysfunction evaluation, requires expensive equipment in advanced laboratories limiting accessibility and direct translation to clinical practices. Validating the wearable technology OneStep will help clinicians diagnose and treat declines in gait.

Presentation #A31

College: Health

School / Department: Physical Therapy and Athletic Training

Email: chancdp@gmail.com

Research Mentor: Jesse Christensen

The Role of Ornithine, Polyamines, and Amino Acid Accumulation in the Growth of Melanoma

Presenter Name: Austin Bender

Argininosuccinate synthetase 1 (ASS1), the rate limiting enzyme in the conversion of citrulline and aspartate to arginine (Arg), is frequently downregulated in melanoma. Recent therapies target this by depleting exogenous Arg but have found only limited success. Looking for other vulnerabilities that arise with ASS1 deficiency, we

investigated the role of ornithine and polyamines in the growth of these cells and the accumulation of amino acids by cells grown in amino acid deficient growth media.

Presentation #A32

College: Medicine

School / Department: Biochemistry

Email: u1312152@utah.edu

Research Mentor: Gregory Ducker

Circadian timing, information processing, and energy balance (TIME) Study

Presenter Name: Emely Huerta Sanchez

There are various known risk factors that can worsen cardiometabolic health. Some include late sleep timing, short sleep duration, and neurobehavioral processes. By improving behavioral factors we can test a longitudinal relationship between circadian alignment and cardiometabolic risk factors. The TIME Study looks to improve circadian rhythm by measuring effects of circadian alignment on neurobehavioral measures, dietary behaviors, and cardiometabolic risk factors.

Presentation #A33

College: Medicine

School / Department: Family & Preventative Medicine

Email: u1335390@utah.edu

Research Mentor: Kelly Baron

The Concentration of Tuberculosis within Paraguay's Incarcerated and Indigenous Populations, 2018-2022

Presenter Name: Jacob Sussman

In collaboration with Paraguay's National Program for Tuberculosis Control (NPTC), we conducted a spatial analysis of tuberculosis (TB) cases in Paraguay from 2018-2022, in order to identify areas of high transmission and the communities at highest risk. This work aims to help prioritize NPTC control efforts. We found that Indigenous and incarcerated populations make up a high proportion of TB cases in Paraguay, and observed that TB case notifications are spatially concentrated.

Presentation #A34

College: Medicine

School / Department: Internal Medicine

Email: u1373043@utah.edu

Research Mentor: Katharine Walter

Transcriptome-Based Risk Score Predicts Time to Treatment Failure for Multiple Myeloma Patients

Presenter Name: Ishmael Elliott Molina-Zepeda

Identifying multiple myeloma patients at high risk of early treatment failure is a critical need. Most patients fail first-line therapy and ~50% of patients do not survive past 5 years after diagnosis. This project shows that SPECTRA, a statistical technique developed by the Camp Lab, can characterize global gene expression by representing it as multiple quantitative tumor variables. Spectra variables

allow gene expression to be incorporated into predictive modeling to identify high-risk groups.

Presentation #A35

College: Medicine

School / Department: Internal Medicine

Email: u1243941@uemail.utah.edu

Research Mentor: Nicola Camp

**Procoagulant Platelet Formation and Function:
Mitochondrial Calcium Uniporter's Role in Platelet
Activation**

Presenter Name: Mia Kowalczyk

This study explores the role of mitochondrial calcium uniporters (MCU) in platelet activation and its implications for thrombosis. Murine experiments reveal MCU deficiency alters platelet activation pathways, affecting aggregation, mitochondrial calcium flux, and reactive oxygen species (ROS) generation. Findings suggest the MCU plays a crucial role in mediating platelet activation and thrombosis in an ITAM-dependent manner. Targeting the MCU may offer a strategy for reducing thrombotic events.

Presentation #A36

College: Medicine

School / Department: Internal Medicine

Email: u0632333@utah.edu

Research Mentor: Robert Campbell

Behavioral Effects of Trauma Recruit Separate Populations of Ventral Hippocampal Neurons

Presenter Name: Addison Hedges

Trauma has been reported to affect over 70% of all adults worldwide. Exactly how these traumatic events are encoded in the brain is poorly understood. This project aims to test the hypothesis that distinct populations of neurons in the ventral hippocampus encode individual behavioral effects of trauma as well as discover the extent of overlap between neuronal cells activated by trauma-induced aggression vs. trauma-altered sociability.

Presentation #A37

College: Medicine

School / Department: Neurobiology & Anatomy

Email: addison.hedges@hsc.utah.edu

Research Mentor: Moriel Zelikowsky

Understanding the role of the neuropeptide Tac2 in aggressive behavior post acute stressor.

Presenter Name: Veronic Boire

Preliminary research results found by Zelikowsky's lab showed that the activation of Tac2 neurons induced aggression in the absence of stress. Other results showed that Tac2 expression promoted aggressive behavior post

chronic social isolation stress. My research is focused on the inhibition of Tac2 neurons post acute stress. This research strengthens the theory of Tac2 prominent role in increased aggressivity in individuals following stressors.

Presentation #A38

College: Medicine

School / Department: Neurobiology & Anatomy

Email: u1426731@utah.edu

Research Mentor: Moriel Zelikowsky

**Relationship Between Pupillometry, Olfaction,
Balance, and Cognition in Individuals with
Parkinson's Disease and Essential Tremor**

Presenter Name: Paige Noble

Dysfunction in cholinergic processes in the brain could be the cause of the gait and balance impairments that are seen with a PD or ET diagnosis. The current impairment tests used are suboptimal. The pupillary light reflex (PLR) as well as the smell pathway both use cholinergic networks that can be affected by PD and ET. By assessing the presence of hyposmia and the PLR, we can strengthen the roles of these as noninvasive reliable indicators for PD and ET.

Presentation #A39

College: Medicine

School / Department: Neurology

Email: u1329957@utah.edu

Research Mentor: Guillaume Lamotte

**Identifying Biomarkers that can be Used to
Diagnose Neuropathic Postural Orthostatic**

Tachycardia Syndrome (POTS)

Presenter Name: Carson Sautter

My research took the aim to identify lab and clinical based indicators such as Valsalva ratios, heart rate variability within a standard tilt table setting, CASS scores, and QSWEAT values to identify more concise and accurate parameters for delivering a POTS diagnosis in a translational research approach.

Presentation #A40

College: Medicine

School / Department: Neurology

Email: u1280823@utah.edu

Research Mentor: Melissa Cortez

AVR-48, a novel immunomodulatory molecule, improves lung function and structure in mechanically ventilated preterm lambs

Presenter Name: Katarina Prill

Despite advancements in the respiratory management of neonates, bronchopulmonary dysplasia (BPD; also known as neonatal chronic lung disease) remains absent of any definitive treatment options. AVR-48 is a novel immunomodulatory molecule derived from chitohexaose, an essential structural component responsible for the pathogen immune responses of filarial parasites. We hypothesized that AVR-48 will improve early outcomes of preterm lambs that are mechanically ventilated for 7d. Lung function was measured in terms of respiratory severity score, saturation/FiO₂ (S/F) ratio, PaO₂/FiO₂ (P/

F) ratio, oxygenation index, Aterial-alveolar oxygen (A-a) gradient, resistance (R), dynamic compliance (Cdyn), as well as structural indices.

Presentation #A41

College: Medicine

School / Department: Pediatrics

Email: u1361750@utah.edu

Research Mentor: Kurt Albertine

FDG PET Investigation of Histopathologically-Confirmed Fused in Sarcoma Proteinopathy, Frontotemporal Dementia, and Alzheimer's Disease

Presenter Name: Caroline Giddings

To characterize the ^{18}F -fluorodeoxyglucose positron emission tomography (FDG PET) findings in histopathologically-confirmed Alzheimer's disease (AD), frontotemporal dementia (FTD), and fused in sarcoma (FUS) for which specific imaging biomarkers are not yet available.

Presentation #A42

College: Medicine

School / Department: Radiology & Imaging Sciences

Email: u1360503@utah.edu

Research Mentor: Donna Cross

Longitudinal Analysis of Ventricular Volume Development in Males with Autism Spectrum Disorder

Presenter Name: Mikayla Anderson

This research investigates ventricular volume changes in males with autism spectrum disorder (ASD) compared to typically developing controls (TDC) over two decades. Utilizing MRI data from 42 individuals (34 ASD, 9 TDC), advanced imaging techniques reveal longitudinal differences. By addressing a critical gap in the literature with longitudinal analysis, the research sheds light on persistent structural differences in ASD, informing future interventions.

Presentation #A43

College: Medicine

School / Department: Radiology & Imaging Sciences

Email: u1228507@utah.edu

Research Mentor: Jace King

Absolute MR Thermometry in the breast using interleaved echo planar spectroscopic imaging

Presenter Name: Peyton Wong

MR Thermometry is widely used to monitor and evaluate

thermal treatments. The proton resonance frequency method only measures temperature change and does not work in adipose tissue, but spectroscopic imaging methods make it possible to determine absolute temperature. This research aims to develop a novel spectroscopic approach for noninvasive measuring of absolute temperature in the breast to improve treatment evaluation by providing accurate starting temperatures for thermal dose calculations.

Presentation #A44

College: Medicine

School / Department: Radiology & Imaging Sciences

Email: u1099617@utah.edu

Research Mentor: Henrik Odeen

Midlife Women's Experiences of Participating in MENOGAP

Presenter Name: Jennie Leo

MENOGAP is an integrative medical group visit (IMGV) intervention that focuses on prioritizing awareness, providing education, and fostering empowerment for perimenopausal and menopausal women. It includes four weekly educational sessions, covering a wide range of perimenopausal and menopausal symptom-related topics. This research is essential as it aims to address the gap in knowledge of these symptoms by helping midlife women better understand perimenopause and menopause management.

Presentation #A45

College: Nursing

Email: u1349473@utah.edu

Research Mentor: Lisa Taylor-Swanson

Elucidating different ways to regulate the NF- κ B pathway through the hypoxia associated factor (HAF) and the hypoxia inducible factor (HIF)

Presenter Name: Lily Halberg

Hepatocellular Carcinoma (HCC) is the most common form of liver cancer in the United States. Inflammation is a key factor in the progression from fatty liver disease to HCC, so pro-inflammatory pathways such as the NF- κ B pathway have been studied. I studied the colocalization of HAF and other key proteins in the pathway to determine if there is any transcriptional regulation occurring in the nucleus. I also studied HCC cells in a hypoxic environment to determine the impact of HIF on the pathway.

Presentation #A46

College: Pharmacy

School / Department: Pharmacology and Toxicology

Email: u1390677@utah.edu

Research Mentor: Mei Koh

Coming Home: A Project of History, Heartache, and Heritage

Presenter Name: Thea Soter

By examining the relationship of Utah's Cretan communities with the Carbon County mines and railroad industries in the early twentieth century, I hope to establish a connection to my own ancestors and

community members who immigrated to the area during the time period. In doing so, I will track the emotional, cultural, and communal effect that immigration had on these people to better understand the state's unique relationship to immigration both in the past and present.

Presentation #A47

College: Humanities

School / Department: English

Email: theadoraisabella@gmail.com

Pre-Study Considerations: Quantifying Novel Slur Formation Through Textual Media Analysis

Presenter Name: Lex Putnam

Research into novel slur formation suggests that periods of new or heightened tension between groups are likely to cause the formation of new slurs, consistent with theories of degeneration and contempt crystallization. Merging gender studies and computational linguistic methodologies, this study aims to lay groundwork for assessing slur formation in the digital age, and is of increasing importance in the wake of human rights crises being declared for Trans Americans.

Presentation #A48

College: Humanities

School / Department: Linguistics

Email: u1120882@utah.edu

Research Mentor: Aniello De Santo

An Analysis of Vowel Reduction in Bolognese

Presenter Name: Brandon Osgan

In my research, I present an ongoing analysis of vowel reduction in Bolognese. Vowel reduction is a process by which vowels change due to a change in stress (this is why the ‘a’ sound in “atom” and “atomic” are different). I explain the vowel reduction patterns and suggest the presence of three ambiguous classes of words that determine the vowel reduction pattern used. These classes may relate to those identified in Saunders (1984) though further research is needed.

Presentation #A49

College: Humanities

School / Department: Linguistics

Email: u1356266@utah.edu

Research Mentor: Edward Rubin

Recognizing the Emerging Ethical Agency of Adolescents

Presenter Name: Pierce Christoffersen and Kalista Leggitt

When scholars discuss adolescents making medical decisions, their autonomy is often overlooked. Concerns about misinformation, limited education, and experience do not correlate with their ability to act ethically. This is not solely an issue of guidance for healthcare

professionals and the adolescent's family; it delves into the ethical responsibility that adolescents themselves assume. An adolescent's responsibility conflicts with their ability to make fully informed decisions with consent.

Presentation #A50

College: Humanities

School / Department: Philosophy

Email: u1327266@utah.edu

Research Mentor: Matt Haber

Factors Associated with Diabetes

Presenter Name: Fatima Faizi

Diabetes is an autoimmune condition that impairs the body's ability to process blood glucose, otherwise known as blood sugar". Common symptoms of diabetes include increased thirst, increased urination, dehydration, blurred vision, fatigue, or unexplained weight loss. Factors associated with diabetes include caffeine, sleep deprivation and high fructose corn syrup(HFCS).

Presentation #A51

College: Social & Behavioral Science

School / Department: Health Society and Policy

Email: u1194455@uemail.utah.edu

Research Mentor: Man Hung

Embracing Perspectives of Melanesian West Papua in Museums as a Way of Recognition and Decolonization

Presenter Name: Mike Komigi

The complicated issue in West Papua such as annexation, colonialism, struggle to independence, and the emerging ideology of West Papua nationalism, are not reflected in the Utah Museum of Fine Arts (UMFA) when the institution labels West Papuan artifacts with “Indonesia” tag without bringing the ongoing political contexts. We interview West Papuan students, Pasifika activists and scholars, and different other museums to find better ways of displaying West Papuan artifacts in museums.

Presentation #A52

College: Cultural & Social Transformation

School / Department: Gender Studies

Email: michael.komigi@utah.edu

Research Mentor: Maile Arvin

Climate Optimism in Environmental and Sustainability Studies Students at the University of Utah

Presenter Name: Abbie Nistler

This work looks at the emotions environmental and sustainability studies (ENVST) feel surrounding climate change, specifically climate optimism. It explores if climate optimism and climate anxiety are related, how climate optimism changes as students progress in their degree, how high impact experiences impact climate optimism, and if demographics impact climate optimism. The data comes from a survey distributed to ENVST students in a variety of classes.

Presentation #A54

College: Social & Behavioral Science

School / Department: Geography

Email: u1303050@utah.edu

Research Mentor: Jennifer Follstad Shah

Fiscal Fundamentals: Fiscal Analysis and Legislative Decision-Making in Utah

Presenter Name: Andrew Sonzini

Fiscal analysis plays an indispensable role in Utah's

legislative process. Utah's constitutional requirements and culture of fiscal conservatism have contributed to the construction of existing arrangements in this area. To better assess its influence on legislative decision-making, I analyzed existing literature and interviewed current or former legislators, fiscal analysts, as well as executive staff and other public officials.

Presentation #A55

College: Social & Behavioral Science

School / Department: Political Science

Email: u1191728@utah.edu

Research Mentor: James Curry

**Identity Formation and Politicization: A
Comparative Study of Muysca and Campesino
Communities in the Cundiboyacense Territory of
Colombia**

Presenter Name: Cindy Diaz Rey

The objective of this research project is to examine the processes and factors that led to the emergence and embracing of a campesino identity among Muysca descendant people. By conducting a qualitative comparative study between Muysca groups that are officially recognized today and those who identify as farm workers, the research will delve into the complexities of identity formation and politicization in the Cundiboyacense

territory of Colombia.

Presentation #A56

College: Social & Behavioral Science

School / Department: Political Science

Email: u1271907@utah.edu

Research Mentor: David De Micheli

**THE INFLATION REDUCTION ACT'S MEDICARE PART D
DRUG PRICE NEGOTIATION: AN UNLIKELY OUTCOME**

Presenter Name: Nick Johnson

The Inflation Reduction Act (IRA) was signed into law on August 16, 2022, and the passage of this unassuming piece of legislation marks one of the most important advancements in healthcare policy in the United States. A key component of the law is its efforts to increase access and affordability of prescription drugs for Medicare Part D enrollees. My research explores the political, economic, and social factors behind this legislation.

Presentation #A57

College: Social & Behavioral Science

School / Department: Political Science

Email: u1307198@utah.edu

Research Mentor: Phillip Singer

**Blame avoidance by members of Congress in
regards to Texas V. California**

Presenter Name: Emalee Carroll

This research project aimed to understand the strategies

and tactics employed by members of Congress to engage in credit claiming and blame avoidance across three Supreme Court cases related to the ACA. I conducted a longitudinal analysis of credit claiming and blame avoidance by all Congressional elected officials holding office since 2012. I collected, coded, and analyzed Congressional press releases, a resource that has been used in several prior studies

Presentation #A58

College: Social & Behavioral Science

School / Department: Political Science

Email: u1311938@utah.edu

Research Mentor: Phillip Singer

Analyzing Differences in Reward Pathway Activity and Hormone Fluctuation Between Heavy Alcohol Users and Controls

Presenter Name: Jack Landmesser

Alcohol Use Disorder is a widespread problem in the U.S., associated with health risks and behavioral changes. Females are at a greater risk of relapse and escalate to alcohol dependence more quickly than males. However, female addiction research is historically lacking. Previous research has shown that hormones influence reward processing and impact addiction. Therefore, this study evaluates hormone fluctuation and fMRI imaging relationships to provide more personalized addiction treatment.

Presentation #A59

College: Social & Behavioral Science

School / Department: Psychology

Email: u1313542@utah.edu

Research Mentor: Scott Langenecker

Do peers suggestions change depending on female athletes body type and sport they compete in?

Presenter Name: Carissa Guardado

The current study experimentally examines the different Improvement suggestions people give to female athletes who have an ideal body (lean) vs. those who do not (non-lean) when they compete in a lean (distance running) vs. non-lean (softball) sport. Particularly, we are interested in suggestions that emphasize the athlete changing their physique (e.g., lower BMI) or eating habits (e.g., cut calories). This study provides us insights into the social pressures that female athletes experience.

Presentation #A60

College: Social & Behavioral Science

School / Department: Psychology

Email: u1416671@utah.edu

Research Mentor: Carol Sansone

Healthcare Access Barriers in Utah Muslim Communities

Presenter Name: Akow Ibrahim

The purpose of this research is to examine how cultural barriers and health literacy are associated with access to care and communication with providers in Muslim communities in the United States. Cultural barriers, poor health literacy, and lack of access to care continue to remain prominent in underserved communities across the U.S. By identifying cultural differences that affect the care of Muslim patients, Healthcare providers are able to shorten the gap between barriers and access to care.

Presentation #A61

College: Social & Behavioral Science

School / Department: Sociology

Email: u1171191@utah.edu

Research Mentor: Akiko Kamimura

Patterns: The Theory of Design in History

Presenter Name: Leisina Wolfgramm

This research project investigates the patterns and designs present in Alois Riegl's pattern book "Stilfragen." Using primarily Riegl's book and Owen Jones' "The Grammar of Ornament," I look into locating the physical objects from these books which form the basis of the art historical canon surrounding cultural motifs. The obscure objects are brought to light through this work and the methodological approach to information collection

provides an explanation to their significance and inclusion.

Presentation #A62

College: Fine Arts

School / Department: Art & Art History

Email: u1282806@utah.edu

Research Mentor: Meekyung MacMurdie

**Engaging Embodiments: Exploring Materials,
Entities, and Phenomenology**

Presenter Name: Alix Wright

Working with my mentor to create a body of sculpture work that is a phenomenological study considering the inseparable reality of cognitive and material experience. Through sculptures, large scale installations, video, and sound we examine our relationship to materials, entities and the “things” of the world that we encounter. The focus is on how each of us as embodied beings come to know the world only through active, considered engagement.

Presentation #A63

College: Fine Arts

School / Department: Art & Art History

Email: u0832835@utah.edu

Research Mentor: Heath “Moses” Williams

Quercus gambelii Acorns as an Indigenous Food Resource in the Great Basin, Colorado Plateau & Southwest

Presenter Name: Sophia Dodge

This project seeks to address the understudied presence of Gambel Oak acorns in the archaeological record of the Great Basin, Colorado Plateau, and Southwest regions. While ethnographic data and historical records suggest that Native peoples in this area consumed some Gambel Oak acorns, their recognition in archaeological contexts has been limited. This study aims to assess the viability of methodologies for identifying macrobotanical acorn remains.

Presentation #A64

College: Social & Behavioral Science

School / Department: Anthropology

Email: u1157082@utah.edu

Research Mentor: Alexandra Greenwald

The Relationship of Air Quality Index (AQI) to positive COVID-19 test count within the Utah RECOVER study population

Presenter Name: Tyler Allison and Andrew Hart

We aimed to determine whether there is a relationship between the number of COVID-19 infections and AQI at the county level. We analyzed the data of 574 workers from the RECOVER study. Participant data was sorted by county. Counties included in our analysis are as follows: Utah County with 55 participants, Salt Lake County with

438 participants and Davis County with 81 participants. Within our study, AQI and Positive Covid Tests have no significant correlation.

Presentation #A65

College: Medicine

School / Department: Family & Preventative Medicine

Email: u1343396@utah.edu

Research Mentor: Sarang Yoon

Influence of Ion Identity and Thermal Annealing on N-Type Organic Mixed Conductors

Presenter Name: Arnel Besic

Organic mixed ionic electronic conductors (OMIECs) are conjugated polymers that conduct both ions and electrons. These materials are promising for applications in healthcare and energy technologies, including biosensors and batteries. An obstacle for using these materials in next-generation technologies is a lack of understanding of the fundamental principles that underlie operation, particularly the coupled ion motion, electron transport, and structural dynamics.

Presentation #A67

College: Science

School / Department: Chemistry

Email: u0924471@utah.edu

Research Mentor: Connor Bischak

Science or Pseudoscience? Theory Change Between Theories of Disease

Presenter Name: Lauren Wigod

Miasma theory, the obsolete theory of disease that claimed that disease was spread via “bad airs”, is commonly considered pseudoscience today despite having good qualities. In addition, it is unclear how this theory was rejected and replaced with Germ theory of disease, the theory we still hold today. My project applies several analytic philosophical accounts of theory change to this historic case including Popperian falsification and Kuhn paradigm shifting to explain how this event happened.

Presentation #A68

College: Humanities

School / Department: Philosophy

Email: u1310825@utah.edu

Research Mentor: Melinda Fagan

Transdermal antiseptic products as a method to decrease bioburden in skin prior to surgery

Presenter Name: Abbey Blair

Surgical site infections affect a number of patients post-surgery and pose a major threat to successful surgical outcomes. The majority of SSIs stem from an individual’s endogenous skin flora. To mitigate this risk, the clinical standard is to cleanse the skin prior to surgery using skin preparation kits. Our research designates that there are

means for improvement in PSP technology in order to quantify and kill deep-dwelling bacteria in the skin.

Presentation #A70

College: Medicine

School / Department: Orthopaedics

Email: u1167842@uemail.utah.edu

Research Mentor: Dustin Williams

The Importance of Ethics as Technology Advances

Presenter Name: Quinn Cappellucci, Elizabeth Lopez, Cohen Nash, and Gabe Nelson,

As AI is starting to become integrated in all aspects of society, ethics are a concern regarding privacy, biases, and harmful misuse. Our project shows the implications of LLM, like ChatGPT, focusing on creating policies to help protect users privacy, avoid biases, and maintain a balance between risk and innovation. Using a research question and working as a team, we aim to contribute to the debate around ethics as technology advances.

Other group members:

Presentation #A71

College: Business

School / Department: Operations & Information Systems

Email: u1217973@utah.edu

Research Mentor: Sankar Srinivasan

Utilization Of Machine Learning Models In Modeling The Binding Of Aromatic Compounds To Insect Olfactory Receptor Neurons

Presenter Name: Kobi Baker

My research revolves around creating methods for designing machine learning models that can interpret 3D ligand-receptor binding models which are based based on real world data. We can then train these machine learning models to point towards which ligands/odorants have the greatest chance of successfully binding to the receptors of their insect of interest before conducting lab or field trials. This can also give researchers a better idea of what types of molecules best fit what receptors.

Presentation #A72

College: Science

School / Department: Biological Sciences

Email: u0916420@utah.edu

Research Mentor: Martin Horvath

2.

Tuesday, Apr 9th | 9:00 AM – 10:30AM**Collegiate Room**

Moderator: Larsen

Modeling Microcephaly in Drosophila*Presenter Name: Adriana Bibo*

Microcephaly is a neurodevelopmental disorder that can be accompanied by comorbidities including intellectual disabilities, seizures, and other developmental phenotypes. It is attributed to malnutrition and exposure to toxins or infection during pregnancy, but genetic mutations are also a leading cause. Our lab studies the genetic mechanisms behind neurodevelopmental disorders, such as microcephaly, using *Drosophila* as a model organism.

College: Medicine**School / Department:** Neurobiology & Anatomy**Email:** adriana.bibo@utah.edu**Research Mentor:** Nicole Losurdo

A qualitative study exploring students opened ended responses regarding belonging uncertainty in general chemistry

Presenter Name: Jocelyn Tucker and Josie Valerius

This study focuses on understanding what aspects of a course affects a student's feelings of societal belonging with the goal of exploring qualitative responses to create actionable change that increases student retention in STEM. In a survey, students in Gen Chem 1 explained what impacts their sense of societal belonging in the course. We categorized the responses to uncover the significant parts of a STEM course that may cause a student to feel uncertain in their level of social belonging.

College: Science

School / Department: Chemistry

Email: u1364165@utah.edu

Research Mentor: Regina Frey

Build a Secretion Selection for SPI-1 System via Fusion Proteins

Presenter Name: Harold Chen

Salmonella Pathogenicity Island 1 (SPI1) is a region of the Salmonella chromosome that codes for the genes necessary to build a type 3 secretion (T3S) injectisome system. My research aims to develop new genetic tools in order to facilitate the study of the SPI1 injectisome system. What is needed for the characterization of SPI1 secretion mechanisms is the development of reporters

that allow for selection of protein substrates through the injectisome T3S system to the outside medium.

College: Science

School / Department: Biological Sciences

Email: u1442069@utah.edu

Research Mentor: Fabienne Chevance

Genetic Diversity and Asymptomatic Malaria

Presenter Name: Vivian Marcoux

The focus of this analysis is on differences in symptomology between B6 mice and wild mice when infected with Plasmodium. We compared those mice' genomes, microbiomes, and immune response to Plasmodium infection. We found that wild mice had a greater degree of in-group diversity than B6 mice, as well as a significant difference from B6 mice.

College: Science

School / Department: Biological Sciences

Email: u6025936@utah.edu

Research Mentor: Wayne Potts

Tuesday, Apr 9th | 9:00 AM – 10:30AM

Parlor A

Moderator: Raghuraman

Lifestyle interventions, physical function, and cancer survivorship

Presenter Name: Maren Curtis

This project examines the impacts of lifestyle interventions on physical function and cancer survivorship. It will involve a combination of two analyses. One will evaluate the feasibility of manipulating time of day of exercise engagement on physical function and dietary patterns among women with stage I-III breast cancer receiving chemotherapy. The second project will map the literature on lifestyle interventions and physical function in older cancer survivors of all cancer types and stages.

College: Health

School / Department: Health, Kinesiology, and Recreation

Email: u1047821@utah.edu

Research Mentor: Adriana Coletta

Examining the relation between therapists CBIT performance outcomes and satisfaction of training condition

Presenter Name: Rebecca Fife

Access to CBIT, a behavioral treatment for tics, is severely limited due to a lack of CBIT-Trained providers. An online therapist training program has been created to make training more accessible in hopes of increasing the number of trained therapists. The aim of this study is to examine if there is a difference in therapists' performance

outcomes (ability to administer CBIT with fidelity) based on their satisfaction with their training condition (i.e., in-person versus online training).

College: Social & Behavioral Science

School / Department: Psychology

Email: u1200713@utah.edu

Research Mentor: Michael Himle

Social Class Representation in America

Presenter Name: Max Lepore

My research consists of analyzing working-class representation in American political institutions, particularly the U.S. Congress. I have conducted a thorough literature review on the theoretical and empirical work done on working-class representation in our country as well as how members of the working class represent the working class differently in legislative bodies than do representatives from other backgrounds. I also am currently conducting my own empirical research on these topics.

College: Social & Behavioral Science

School / Department: Political Science

Email: u1332202@utah.edu

Research Mentor: James Curry

PART II

SESSION II - 10:45AM - 12:15PM

3.

POSTER PRESENTATIONS

10:45AM-12:15PM

Investigative Work in Antibiotic Treatment of Biofilms Using New Reactor Models

Presenter Name: Travis Martinez

This presentation seeks to compare three bacterial inhibitory concentration models – the MIC assay, CDC Biofilm reactor, and a new model developed in the Bone and Biofilm lab as well as explore the scope of the problem with biofilm. Understanding the importance of biofilm's role in antibiotic treatment is vital because preventing antibiotic resistance requires overcoming the natural defenses of biofilm. For this reason, biofilm-related infections are a large burden on healthcare system.

Presentation #B1

College: Engineering

School / Department: Bioengineering

Email: u0886528@utah.edu

Research Mentor: Dustin Williams

Identifying cancer cell death during in vitro drug testing using machine learning

Presenter Name: Sara Morrison

In association with the Zangle Lab, this project aimed to develop a binary classification method to distinguish between dead and living tumor cells undergoing drug treatment. Several machine learning algorithms were trained on manually identified dead cell data, and were able to accurately identify dead cells.

Presentation #B2

College: Engineering

School / Department: Chemical Engineering

Email: u1242755@utah.edu

Research Mentor: Thomas Zangle

Effects of Surfactants in Bio-Liquid-Based Slurries

Presenter Name: Ashton Phelps

Hydrogen is a promising energy source with many uses. However, many issues surround its production. Entrained Flow Gasification (EFG) can help this problem as it processes hydrocarbon-rich liquids and converts them into syngas, which is used for hydrogen production. One of the problems facing EFG is the mixture's viscosities being too high for

processing in gasifiers. Viscosity-decreasing additives may help solve this problem. The effects of these additives are the scope of my research.

Presentation #B3

College: Engineering

School / Department: Chemical Engineering

Email: u1441905@utah.edu

Research Mentor: Kevin Whitty

Read Out Label Optimization for Lateral Flow Assay to Detect CMV

Presenter Name: Alex Altherr

Creating a cost-effective diagnostic test for congenital cytomegalovirus infections has been the goal, as an alternative to the time-consuming and labor-intensive PCR tests. A few factors must be considered to optimize a vertical or lateral flow device. Golden nanoparticle size, along with antibody selection are a couple examples of factors to be considered. By utilizing Raman spectroscopy and Ultraviolet-visible spectroscopy we can obtain a quantitative result of the assays, to optimize.

Presentation #B4

College: Engineering

School / Department: Electrical and Computer Engineering

Email: u1083963@umail.utah.edu

Research Mentor: Lars Laurentius

Electroaerodynamic Pumps for Silent, Solid-State, and Direct Electronics Cooling

Presenter Name: Quinna Nguyen

Electroaerodynamic (EAD) actuators utilize a DC corona discharge to ionize the air locally around lithographically defined “emitter” tips and accelerate the ions towards a “collector”. This process generates an entrained airflow through momentum-transferring collisions between accelerated ions and neutral air molecules. The mechanism is attractive because it is silent, solid-state, and highly down scalable. We plan on using this wind for pinpoint thermal convection cooling.

Presentation #B5

College: Engineering

School / Department: Electrical and Computer Engineering

Email: quinna.nguyen@utah.edu

Research Mentor: Daniel Drew

Strategies for Downsampling Electromyographic Signals for Low-Power Wearables

Presenter Name: Josh Gubler

Electromyographic (EMG) signals are a measure of the electrical activity within muscles when they contract and are used in the control of prostheses, robotics, exoskeletons, and human-computer interfaces. Most of the power in an EMG signal is contained between 50 and 500 Hz, and most recording devices sample the muscle signals at 1 kHz to fully capture these frequencies. Here

we explore which components of EMG signal are critical for control in order to minimize computational input on devices.

Presentation #B6

College: Engineering

School / Department: Electrical and Computer Engineering

Email: u1195912@utah.edu

Research Mentor: Connor Olsen

Angle Tilt Effect on Solar Panel Performance

Presenter Name: Judy Ojewia

Renewable energy sources such as solar energy are vital to meet power needs sustainably. This study aims to determine optimal angles for solar panel roof applications. DC voltage and current output measurements were performed while varying the angle tilt (0-90°) of a solar panel under a constant light source. To account for fluctuations in the sun's angle the solar cells will be installed on various 3D houses. We aim to determine the optimal angles of the solar cells at various times of the day.

Presentation #B7

College: Engineering

School / Department: Electrical and Computer Engineering

Email: u6026126@utah.edu

Research Mentor: Heayoung Yoon

Depolymerization of epoxy polymers at ambient conditions for carbon fiber recycling

Presenter Name: Anna Huber

My project uses performic acid as a solvent to degrade carbon fiber reinforced polymers. The epoxy resin degrades in solution, leaving behind intact carbon fiber weave that can be reused in new carbon fiber parts. I have been focused on degradation and mechanical testing. I also am studying the chemistry behind the degradation in order to figure out if the epoxy or performic acid can be collected and reused.

Presentation #B8

College: Engineering

School / Department: Materials Science and Engineering

Email: u1353704@utah.edu

Research Mentor: Chen Wang

Using OpenSim to Model, Simulate, and Improve Gait Symmetry in Stroke Survivors.

Presenter Name: Logan Lancaster

When someone has a stroke, there is a chance that they could lose symmetry in their gait because of hemiparesis. This asymmetry can cause a loss of balance which increases the risk of falling. Research shows that connecting a spring between the ankles of runners efficiently transfers energies between the legs and reduces metabolic cost. Our hypothesis is that applying this principle to people with asymmetrical gait could

potentially transfer energy from the legs and improve gait symmetry.

Presentation #B9

College: Engineering

School / Department: Mechanical Engineering

Email: u1287038@utah.edu

Research Mentor: Haohan Zhang

Investigation of the Representative Volume Element in Fibrous Porous Systems

Presenter Name: Tyler Walker

To understand the relationship between the properties of fibers on the microscopic scale to the mechanical properties of fibrous materials on the macroscopic scale, I worked with a graduate student to develop a computer program that can generate a representative sample of a fibrous material with full control over fiber parameters. This is then passed to another script which applies mechanical loading to the system, after which the properties can be characterized.

Presentation #B10

College: Engineering

School / Department: Mechanical Engineering

Email: u1374111@utah.edu

Research Mentor: Pania Newell

Properties of Droplets Splitting Off a Spoked Superhydrophobic Surface

Presenter Name: Yang Yang

The research looks at the physical and thermodynamic properties of droplets splitting off a superhydrophobic surface. This project explores how droplets impacting a superhydrophobic surface takes some heat with the splitting that occurs when droplets land on a spoked surface. The experiment will be performed with aluminum pieces machined with 1-6 spokes to test the heat transfer between the surface and the droplets.

Presentation #B11

College: Engineering

School / Department: Mechanical Engineering

Email: u1378992@utah.edu

Research Mentor: Samira Shiri

Randomized Testing of the WebAssembly System Interface

Presenter Name: Ethan Stanley

The WebAssembly System Interface (WASI) enables WebAssembly (Wasm) programs to interact with the facilities of the computer on which the Wasm program runs. This greatly expands Wasm's utility but also increases the risk of vulnerabilities. It is therefore necessary to thoroughly test implementations of WASI. We evaluate the effectiveness of randomized testing for this purpose. We create a system to perform differential testing on Wasm runtimes and evaluate its effectiveness.

Presentation #B12**College:** Engineering**School / Department:** School of Computing**Email:** u1312964@umail.edu**Research Mentor:** Eric Elde**Expanding Fuzzing Of Critical Program
Configurations Via Coverage-Based Differential
Testing***Presenter Name: David Clark*

I am developing a tool to improve configurable software testing. The tool takes a description of the software's configuration options (think, "on/off settings"), and it outputs a small set of "interesting" configurations, i.e., configurations that could be tested "deeper" than others. These interesting configurations can later be tested with state-of-the-art fuzz-testing techniques. I evaluate this tool by testing open-source libraries with publicly available fuzzing harnesses.

Presentation #B13**College:** Engineering**School / Department:** School of Computing**Email:** u1225394@utah.edu**Research Mentor:** Stefan Nagy**Examining Compositional Behavior in Large
Language Models***Presenter Name: Jordan Tan*

Transformer-based large language models (LLMs) have

seen prolific usage in natural language processing (NLP) tasks, search engines, and code generation. Despite their ability to compose intricate responses, LLMs exhibit reasoning-based limitations in compositional tasks. These are tasks that are complex enough that they require multiple subtasks to complete them. We explore the idea of whether prompting an LLM with in-context subtask examples can improve compositionality.

Presentation #B14

College: Engineering

School / Department: School of Computing

Email: u1283221@utah.edu

Research Mentor: Vivek Srikumar

Chain of Thought Analysis in AI: Large Language Models' Reasoning Performance with Non-Causal Prompts

Presenter Name: Kishan Thambu

Previous research has shown increased large language model (LLM) accuracy with “Chain-of-Thought” (CoT) reasoning, using causality-based prompting for Q&A. By fine-tuning the T5 model emphasizing non-causal prompting using “This is what I know about this: {Explanation}. My answer would be {Answer},” and the reverse, the study aims to assess whether the noncausal prompt fine-tuning models maintains the model’s reasoning performance and explanation reliability in the same way CoT would.

Presentation #B15

College: Engineering

School / Department: School of Computing

Email: u1050585@utah.edu

Research Mentor: Ana Marasović

**RocketCalc: An Adaptive Algebra and Trig
Remediation Platform for Calculus Students**

Presenter Name: Emily Erickson

The largest barrier to student success in calculus is gaps in foundational algebra and trigonometry knowledge. RocketCalc is an online, adaptive tutoring system which diagnoses and effectively closes these gaps so that students can succeed. Students receive the individualized, targeted remediation they need while teachers are freed to focus on teaching new material in class.
www.rocketcalculus.com

Presentation #B16

College: Engineering

School / Department: School of Computing

Email: u1187346@utah.edu

Research Mentor: Daniel Brown

**Investigating the Effects of Single Nucleotide
Polymorphisms on Behavioral Phenotype in
*Drosophila melanogaster***

Presenter Name: Sage Acord

I used the *Drosophila* Activity Monitor to perform sleep assays on 80 isogenic lines of *Drosophila melanogaster*. Each line has largely similar genetic makeup besides the Single Nucleotide Polymorphisms. After completing the

assays, I performed statistical data analysis for notable sleep differences that can be further traced to their genome (sequenced by our Stanford collaborators) and analyzed for correlative and potentially causative relationships between genetic differences and altered sleep.

Presentation #B17

College: Science

School / Department: Biological Sciences

Email: u1196509@utah.edu

Research Mentor: Sophie Caron

Inhibition of the DNA Protein MutT

Presenter Name: Bridget Raymundo

My project examines DNA proteins MutT and MutY in a rare transversion mutation pathway. MutT prevents an OG mutagen from binding to DNA. MutY excises specific nucleotides that contribute to the mutation pathway. This pathway is important since genetic information is lost from the replacement of nucleotides and the switched placement of pyridine and purine on opposite strands. My hypothesis is that when MutT is inhibited and MutY is included, the highest mutation frequencies should be observed.

Presentation #B18

College: Science

School / Department: Biological Sciences

Email: u1287641@utah.edu

Research Mentor: Martin Horvath

Role of Perineuronal Nets in Androgen-Induced

Masculinization of Female Vocal Pathways of African clawed frogs

Presenter Name: Anuhya Yalavarty

Male and female *Xenopus laevis* have distinct calls for reproduction. Testosterone masculinizes female calls, by modifying the vocal pathways. Perineuronal nets (PNNs) are known to regulate neural plasticity. Specifically, PNNs are known to reduce plasticity of fast-spiking parvalbumin (PV) positive neurons. My project aims to test if testosterone modifies calls by reducing PNNs surrounding PV-positive neurons in frogs.

Presentation #B19

College: Science

School / Department: Biological Sciences

Email: U1354463@utah.edu

Research Mentor: Ayako Yamaguchi

The Role of NCP as an Assembly Factor of the Plastid-Encoded RNA Polymerase (PEP) Complex in Plants

Presenter Name: Lexie Bingman

Light initiates chloroplast (green plastid) biogenesis by facilitating the assembly of the plastid-encoded RNA polymerase (PEP) complex. Previous genetic study identified NUCLEAR CONTROL OF PEP ACTIVITY (NCP) that is required for the assembly of the PEP complex, although the mechanism is still unknown. I hypothesize that NCP directly interact with components of the PEP complex. We discover that NCP functions as an assembly

factor through direct interaction with the core components.

Presentation #B20

College: Science

School / Department: Biological Sciences

Email: u0680366@utah.edu

Research Mentor: Chan Yul Yoo

Uncovering the molecular foundations behind the local and systemic immunity of *Brassica napus*, as well as its parent species, *Brassica oleracea*, and *Brassica rapa*.

Presenter Name: Haley Welker

Pathogenic threats to global food security provoke concerns about decreased crop production which could have dire effects. Understanding the plant immune response is essential to develop sustainable defense against pathogenic risks. Our study investigates the regulation of salicylic acid (SA), a vital hormone in the plant immune response, in response to bacterial infection. Higher levels of SA in infected tissues than non-infected tissues suggest the activation of the plant's immune response.

Presentation #B21

College: Science

School / Department: Biological Sciences

Email: u1371745@utah.edu

Research Mentor: Heejin Yoo

Determining the Kinetics of Sulfonate Dopants in

Organic Mixed Conductors

Presenter Name: Kierra Forthman

Organic mixed ionic-electronic conductors are soft, semi-conducting materials that transport both ions and electrons. The integrated movement of ions and electrons in OMIECs provides a means to connect the present gap between digital and biological interfaces. However, the relationship between ion chemical structure and performance metrics of OMIECs remains unclear, especially for molecular ions. This research is aimed at determining how novel ions impact the structure and performance metrics.

Presentation #B22

College: Science

School / Department: Chemistry

Email: u1243745@utah.edu

Research Mentor: Connor Bischak

Synthesis of [2.2]-paracyclophane and Derivatives

Presenter Name: Topher Frederick

Cyclophanes are a general group of molecules defined by an aromatic ring, bridged with alkyl chains, to form a more expansive ring system. In particular, [2,2]-paracyclophane is a highly rigid, geometrically strained cyclophane which is valuable as a parent molecule towards useful derivatives. Using chemistry developed by the Roberts Group, our build, cyclize, and

contract strategy, we propose a synthetic route to the parent molecule and derivatives.

Presentation #B23

College: Science

School / Department: Chemistry

Email: u1196910@utah.edu

Research Mentor: Andrew Roberts

Variability in Time Release Melatonin Tablets

Presenter Name: Ella Bleak, Georgia Brach, Samantha Johnson

Melatonin is a naturally produced hormone regulating the sleep-wake cycle. Supplements for melatonin are commonly used to aid people with trouble sleeping but are not FDA regulated. Studies have shown that there is a large difference between the dosage on packaging and the concentration of melatonin in individual tablets. The purpose of our experiment was to investigate if time-release capsules release a gradual dosage or if the capsules release their dosages more quickly than company claims.

Presentation #B24

College: Science

School / Department: Chemistry

Email: u1346590@utah.edu

Research Mentor: Ashlie Kinross

The Great Decaffeination: A Comparative Study on Removing and Quantifying Caffeine from Coffee Beans

Presenter Name: Alexandra Glatz

This study compares two methods of coffee bean decaffeination, Swiss Water Extraction and ASE Ethyl Acetate Extraction, to determine their relative and absolute effectiveness. Analysis of each method is done via HPLC to determine mg of caffeine extracted per gram of coffee beans. ASE achieved concentrations close to that of the literature value whereas Swiss Water did not extract any detectable caffeine. Data informs efficacy-based recommendations for industry applications.

Other Group Members: Jennifer Kim & CJ Reid

Presentation #B25

College: Science

School / Department: Chemistry

Email: u1376725@utah.edu

Research Mentor: Ashlie Kinross

Symbiotic Star Systems

Presenter Name: Samantha Ball

This project aims to explore the elusive and exotic nature of symbiotic stars, shedding light on fundamental cosmological events and binary system evolution. With new releases from the Gaia catalog, this project seeks to identify potential or confirmed symbiotic stars using machine learning techniques applied to GaiaDR3 astrometric parameters and spectra. The expansion of the

roster of known symbiotic stars will help in our understanding of these intriguing celestial objects.

Presentation #B27

College: Science

School / Department: Physics & Astronomy

Email: u1142170@utah.edu

Research Mentor: Ben Bromley

**Using a Clustering Algorithm to Check Quasars in
The DESI Catalog to Identify Objects in Need of
further Verification of Redshift.**

Presenter Name: Russell Moore

The goal of this project is to group quasar spectra together using a clustering algorithm that will determine how closely related each spectrum is to every other spectrum and whether they belong to the same category or not. There will also be outliers that are different enough to be in smaller clusters or to not cluster with other spectra at all. These will be the objects that we are most concerned about, as they likely have been identified with the wrong redshift.

Presentation #B28

College: Science

School / Department: Physics & Astronomy

Email: srussell.moore@gmail.com

Research Mentor: Kyle Dawson

Evaluating the Prediction of Orographic Precipitation Gradients From a Convolutional Neural Network

Presenter Name: Annabelle Warner

Weather forecasts often decrease in precision over complex terrain due to predictions generalizing for large areas. A convolutional neural network trained to predict orographic precipitation gradients to increase resolution of precipitation forecasting over complex terrain was evaluated for this project. Evaluation of the spatial correlation between facets and their OPG values in the Western US was performed to be applied as a loss function in the training of the model to improve its accuracy.

Presentation #B29

College: Mines & Earth Sciences

School / Department: Atmospheric Sciences

Email: u1189556@utah.edu

Research Mentor: Courtenay Strong

Preliminary Identification of Terrestrial Rock Samples (i.e., Meteor-Wrongs) Recovered by the Antarctic Search for Meteorites (ANMET) at the Dominion Range Icefields, Antarctica

Presenter Name: Melanie Gomez

This study focuses on the preliminary identification of five terrestrial Antarctic rocks that were initially misidentified as meteorites by the ANSMET team

Presentation #B30

College: Mines & Earth Sciences

School / Department: Geology and Geophysics

Email: u1290568@utah.edu

Research Mentor: Jim Karner

Determining the stratigraphic provenance of ex-situ fossils using portable X-Ray Fluorescence technology: a case study from the middle Cambrian of western Utah, U.S.A.

Presenter Name: Emma Boeman

Recently, the Natural History Museum of Utah curated over 2,250 Cambrian fossils from the House Range in western Utah with unknown provenance information. Portable X-Ray Fluorescence technology was utilized to non-destructively analyze the elemental composition and abundances of these rock matrix samples, as well as those from fossil specimens collected in the field. Then, multivariate statistical analyses were implemented to infer the provenance of fossils with limited stratigraphic data.

Presentation #B31

College: Mines & Earth Sciences

School / Department: Geology and Geophysics

Email: u1308772@utah.edu

Research Mentor: Randall Irmis

Identifying Important Sound Features Used by the Brain when Listening in Noisy Backgrounds

Presenter Name: Mia Brown

The human auditory processing system is known to have difficulty understanding speech in noise. The study addresses this knowledge gap by using decision variable correlation, an extension of signal detection theory, to understand the cues utilized by the brain in detecting tones in noise. Results showed that cues associated with sound energy (energy cues) and the slow variations in amplitude across time (envelope cues) are both utilized, and envelope cues are utilized more for longer stimuli.

Presentation #B32

College: Health

School / Department: Communication Sciences and Disorders

Email: u1267963@utah.edu

Research Mentor: Skyler Jennings

Comparison of Manual Wrist-Actigraphy Quantified Sleep Duration versus Auto-Scored Quantified Sleep Duration

Presenter Name: Sophia Loose

Although sleep research has become an increasingly important field in medicine, there is no standard for sleep data scoring. This has become one of the major barriers to progress in the field, as there is no continuity in methodology between labs, in addition to contradicting beliefs about auto-scored data sets. It is believed that the

auto-scored data sets are invalid, however, there are no data analyses directly testing this hypothesis. Therefore, the relative importance of the sleep duration

Presentation #B33

College: Health

School / Department: Health, Kinesiology, and Recreation

Email: u0785025@utah.edu

Research Mentor: Christopher Depner

Post-traumatic stress disorder and alterations in ambulatory blood pressure, daily stress load, and acute pressor response to mental stress.

Presenter Name: Charles Caine

Patients with post-traumatic stress disorder (PTSD) have an increased risk of cardiovascular disease. The physiological underpinnings of this increased risk are poorly understood but may involve alterations in blood pressure regulation related to aberrant cardiovascular responses to stress and increased stress-load. This study is investigating indices of daily stress-load, ambulatory blood pressure, and acute pressor responses to mental stress in patients with PTSD and control subjects.

Presentation #B34

College: Health

School / Department: Health, Kinesiology, and Recreation

Email: u1169165@utah.edu

Research Mentor: Walter Wray

Veteran's Preoperative Lower Limb Strength

Predicts Postoperative Function Following Total Knee or Hip Arthroplasty

Presenter Name: Chelsey Wilbur

The purpose of this study was to assess if preoperative (PREOP) knee extensor (KE) and flexor (KF) peak torque is associated with self-reported function or pain, and performance-based measures of physical function in Veterans 6-month postoperative (POSTOP) TKA or THA.

Presentation #B35

College: Health

School / Department: Physical Therapy and Athletic Training

Email: u1343865@utah.edu

Research Mentor: Jesse Christensen

How patient reported outcomes (PROMIS metrics) differ by gender/ race and ethnicity in bariatric surgery

Presenter Name: Lusia Tamala

Presentation description

Research of ethnicity differences in bariatric surgery

Presentation #B36

College: Health

School / Department: Nutrition

Email: u1223642@utah.edu

Research Mentor: Mary Playdon

Ceramides & Metabolic Dysfunction; Exploring a

New Molecular Culprit

Presenter Name: Amaya Pfannenstiel

Type 2 diabetes is distinguished by insulin resistance, partial insulinopenia, & lipotoxicity, which yields way to high blood sugar and excess fat accumulation. As a consequence, several lipid metabolites including sphingolipids are increased and most importantly, long-chain ceramides, which are causal agents for insulin resistance and steatosis. A diversity outbred panel of mice were screened to find transcripts that were quantitative trait loci for type 2 diabetes. It is suspected that lipid-metabolizing genes could be related to ceramide metabolism or lipid accumulation in the cells. A subset of these genes were overexpressed in an in-vitro model to discern which ones influenced ceramide levels, and to further characterize this relatively unknown subset.

Presentation #B37

College: Health

School / Department: Nutrition & Integrative
Physiology

Email: u1316025@utah.edu

Research Mentor: Scott Summers

Exploring Impaired Heart Rate Response to Exercise in Adults with Parkinson's Disease

Presenter Name: Jake Garfield

Exercise is a beneficial therapy for people with Parkinson's disease (PwPD). However, PwPD experience varying degrees of cardiac impairment related to their PD

pathology. This can contribute to chronotropic incompetence and exercise intolerance, and limit PwPD from taking advantage of exercise interventions. The goal of this research is to identify differences between the altered cardiac responses to exercise in PwPD and the cardiac response of age matched controls

Presentation #B38

College: Health

School / Department: Physical Therapy and Athletic Training

Email: u0908717@utah.edu

Research Mentor: Erin Suttman

The BASIC Trial: An ESKAPE from Transmission

Presenter Name: Alayna Stoddard

The BASIC Study is an investigation into implementation strategies of evidence-based practices that can overcome the barriers that prevent the adoption of practices that decrease the transmission of the ESKAPE pathogens. These practices, often referred to as “The 4 Pillars,” include hand hygiene, intravascular catheter handling, environmental cleaning, and patient decolonization. Each one is designed to decrease pathogen transmission in the operating room to protect the patient from infection.

Presentation #B39

College: Medicine

School / Department: Anesthesiology

Email: u1322492@utah.edu

Research Mentor: Harriet Hopf

Micro-IP Rapid Isolation of Protein Complexes from

Cellular Lysates

Presenter Name: Anna Gilstrap

One of the most important requirements in many protein biochemistry experiments is the ability to isolate and purify proteins of interest. Traditional methods typically aim to generate large quantities of proteins; however, such methods typically rely on long, multi-day experiments and are only effective for well-behaved proteins. I have refined a novel approach termed “micro-IP” that enables micro-scale purifications of proteins from cell lysates that require less than one hour of time.

Presentation #B40

College: Medicine

School / Department: Biochemistry

Email: anna.gilstrap@biochem.utah.edu

Research Mentor: Peter Shen

The Utah Pacific Islander Study

Presenter Name: Emma Taylor

Recruiting and consenting Native Hawaiian/ Pacific Islanders to our research study regarding Diabetes and Chronic Kidney Disease within the population.

Presentation #B41

College: Medicine

School / Department: Internal Medicine

Email: u1362817@umail.utah.edu

Research Mentor: Marcus Pezzolesi

How Social Isolation Impacts Behavior Across

Different Tests

Presenter Name: Rene Valles

Chronic Social isolation has detrimental effects on the brain, health, and behavior. It is especially relevant in times of extended social isolation due to the Coronavirus pandemic. One study conducted by the Harvard Graduate School of Education showed that following the pandemic, roughly 36 percent of Americans report feelings of “serious loneliness”. Our past work has shown that isolation during adolescence causes social anxiety-like behaviors in mice. Comparing data from different behavioral

Presentation #B42

College: Medicine

School / Department: Neurobiology & Anatomy

Email: renejrvalles@gmail.com

Research Mentor: Jordan Grammer

Thalamic Bullseye: Treatment Of Trigeminal Neuralgia

Presenter Name: Ahmed Al Dulaimi

This is a systematic review to prepare for a clinical trial to treat neuropathic Trigeminal Neuralgia.

Presentation #B43

College: Medicine

School / Department: Neurosurgery

Email: u1404775@uemail.utah.edu

Research Mentor: Shervin Rahimpour

Studying Mechanisms that Contribute to Genomic Integrity

Presenter Name: Cameron Davis

Cancer develops when DNA damage goes unrepaired and mutations accumulate. Nup50 and its binding partners, Nup153 and RCC1, are all individually required for 53BP1 to initiate repair at DNA damage sites. I tested mutant versions of Nup50 that are deficient in binding either Nup153 or RCC1 to determine whether those interactions play a role in 53BP1 regulation.

Presentation #B44

College: Medicine

School / Department: Oncological Sciences

Email: cameronseandavis@gmail.com

Research Mentor: Douglas Mackay

Reverse Total Shoulder Arthroplasty Alters the Resting Orientation of the Scapula

Presenter Name: Peyton King

This research investigates altered scapulothoracic orientation in patients post-reverse total shoulder arthroplasty (rTSA). Compared to healthy controls, rTSA patients exhibit significantly reduced scapular protraction. Although variations exist in scapulothoracic angles pre- to post-operatively, the study highlights the lack of a consistent directional pattern in joint recovery.

Presentation #B45

College: Medicine

School / Department: Orthopaedics

Email: peyton.king@utah.edu

Research Mentor: Heath Henninger

Reverse Total Shoulder Arthroplasty Alters the Resting Orientation of the Scapula

Presenter Name: Peyton King

This research investigates altered scapulothoracic orientation in patients post-reverse total shoulder arthroplasty (rTSA). Compared to healthy controls, rTSA patients exhibit significantly reduced scapular protraction. Although variations exist in scapulothoracic angles pre- to post-operatively, the study highlights the lack of a consistent directional pattern in joint recovery.

Presentation #B45

College: Medicine

School / Department: Orthopaedics

Email: peyton.king@utah.edu

Research Mentor: Heath Henninger

Impaired Muscle Moment Arms of the Glenohumeral Joint Following Reverse Total Shoulder Arthroplasty

Presenter Name: Breydon Hardy

Reverse total shoulder arthroplasty (rTSA) replaces the humeral ball with a cup and the glenoid socket with a hemisphere in patients who experience degenerative changes, acute injuries, and shoulder instability. The aim of

this study was to model patient specific shoulder anatomy and compare muscle moment arms between healthy controls and post-operative rTSA patients. Changes in the post-operative muscle moment arms may be useful in quantifying post-operative functional advantages or limitations

Presentation #B46

College: Medicine

School / Department: Orthopaedics

Email: breydon.hardy@utah.edu

Research Mentor: Heath Henninger

Fetal Macrophages Produce Interleukin 7 in the Fetal Hematopoietic Niche

Presenter Name: Danny Barrera

Tissue-resident macrophages play critical roles in tissue homeostasis and have a distinct fetal origin and developmental trajectory as compared to their adult bone marrow-derived counterparts. However, the specific mechanisms underlying their developmental signaling pathways have not been as thoroughly examined as in the adult. This project investigated fetal macrophage cells as a primary source of IL-7 production, a cell signal not associated with adult macrophage development

Presentation #B47

College: Medicine

School / Department: Pathology

Email: u1170778@utah.edu

Research Mentor: Anna Beaudin

AAV9 Gene Therapy Targets in Vanishing White Matter Disease

Presenter Name: Pallavi Prasad

Vanishing White Matter (VWM) Disease, a rare genetic disorder caused by mutations in the eIF2B complex, critical for protein synthesis regulation. Our research employs a mouse model mimicking human mutations to understand and treat VWM. By uncovering the disease's molecular pathways, we aim to develop safe and effective gene therapy treatments, offering solutions for those affected by VWM worldwide. This endeavor marks a significant step forward in addressing the challenges posed by VWM, bringing hope to patients and their families.

Presentation #B48

College: Medicine

School / Department: Pediatrics

Email: u1367961@utah.edu

Research Mentor: Josh Bonkowsky

Alterations in Alzheimer's disease phenotypic pathology after biodegradable paclitaxel-conjugate treatment

Presenter Name: Lana Hua

Alzheimer's Disease (AD) is one of the most common causes of dementia, yet there are limited options for treatment. Microtubule-stabilizing drugs may have the potential for treating AD and altering its pathology by maintaining cytoskeleton structure and stability and preserving functions of neurons, such as axonal transport. This research aims to evaluate changes in hallmark pathophysiological features of AD, namely amyloid plaques and neurofibrillary tangles, after treatment with PTX-conjugate.

Presentation #B50

College: Medicine

School / Department: Radiology & Imaging Sciences

Email: u1164676@utah.edu

Research Mentor: Donna Cross

Investigating Potential Side Effects of Corticosteroid Use for Asthma Treatment

Presenter Name: Kim Lanaghen

Inhaled Corticosteroids (ICs), such as Advair, are among the most common treatments for asthma. Use of ICs in patients can be correlated with voice disorders and vocal fold inflammation in 5-58% of patients. Using experimental and control groups of rabbits, we dosed twice daily with Advair or saline and monitored

progression of inflammation of the vocal fold tissue with scoping. Upon harvesting vocal fold tissue we found elevated levels of inflammatory cytokine IL-6 in rabbits receiving Advair.

Presentation #B51

College: Medicine

School / Department: Surgery

Email: u1210825@utah.edu

Research Mentor: Ben Christensen

Characterization of Phenotypes Resulting from Altered BWA Expression in Drosophila to Develop a Cancer Treatment Screen

Presenter Name: Collin Clark

This project examined the phenotypes resulting from altered BWA expression in Drosophila to develop a cancer treatment screen based upon phenotypic comparison. BWA is an alkaline ceramidase in Drosophila that converts ceramide to sphingosine-1-phosphate (S1P). Increased amounts of S1P have been linked to tumor formation, indicating that BWA over-expression may contribute to tumorigenesis. As such, a method to determine BWA-inhibiting treatments is desired.

Presentation #B52

College: Medicine

School / Department: Oncological Sciences

Email: u1088384@utah.edu

Research Mentor: Bruce Edgar

Impact of Concurrent Administration of Methamphetamine and Fentanyl on Dopaminergic

Neuronal Function

Presenter Name: Carter Martin

Co-abuse of methamphetamine (METH) and the opioid, fentanyl (FEN), is a major public health problem. Prior data indicate that individuals that abuse METH are more likely to develop Parkinson's Disease, particularly individuals with a history of opioid exposure. Thus, we posited that if METH and FEN are co-administered, a METH-induced dopaminergic deficit would occur. Results revealed concurrent exposure did not exacerbate METH-induced dopaminergic deficits as assessed ex vivo in treated rats.

Presentation #B53

College: Dentistry

Email: u1054113@utah.edu

Research Mentor: Annette Fleckenstein

Using film to address reproductive health among Central African immigrants/ refugees resettled in Utah

Presenter Name: Emma Norris

This study investigated the knowledge and values surrounding reproductive and preconception health in a community of Central African refugees resettled in Utah and how the use of community representing film impacted their perspectives. We aimed to highlight main themes expressed by community members. Transcripts from discussion groups after the film showing were coded and organized into themes analysis and discussion.

Presentation #B54

College: Nursing

School / Department: Health, Society & Policy

Email: u1309100@utah.edu

Research Mentor: Sara Simonsen

Understanding Sex Education for Women with Disabilities

Presenter Name: Aidan Cheney

This research was conducted using a survey of 224 women: 135 with physical disability, 49 with a cognitive disability, and 40 with both types of disability. Study questions looked at rates of sex education types received from parents as well as from formal education and compares these rates with the national averages. The study also includes comparison of sex education rates between different disability types.

Presentation Type: Poster

Presentation Format: In Person

Presentation #B55

College: Nursing

Email: u1242841@utah.edu

Research Mentor: Sara Simonsen

The Parent Caregiving Experience of School-Aged Children Diagnosed With Cancer

Presenter Name: Sofia Flowers

When a child is diagnosed with cancer, their parents take on a role as both their parent and their cancer caregiver.

My project is a secondary analysis of Dr. Linder's content validity study that was focused on symptom management. Through interview transcripts, we found 9 main categories that professional staff can learn new aspects of health and enhance their clinical practice, opening new research opportunities.

Presentation #B56

College: Nursing

Email: sofia.flowers@utah.edu

Research Mentor: Lauri Linder

American Native and Alaska Native Women in menopause

Presenter Name: Lorna Khemchand

Brief summary of research: The purpose of this research is to use community-engaged methods to understand the needs of American Indian/Alaska Native (AI/AN) women regarding the menopausal transition. Few studies have focused on the menopausal transition in AI/AN women. We describe AI/AN women's experiences and healthcare needs related to menopause.

Presentation #B57

College: Nursing

Email: u1322396@umail.utah.edu

Research Mentor: Sara Simonsen

Mental health in the workplace with consideration of identity and stigma.

Presenter Name: Emily Hernandez Alzamora

Presentation #B58

College: Business

School / Department: Management

Email: u1238342@utah.edu

Research Mentor: Glen Kreiner

Ethics Beyond the Training Process

Presenter Name: Britta Bolander

Provides an overview of the dominant approach to understanding the ethical implications of implementing machine learning applications in specific contexts, which primarily concerns itself with translating abstract principles into technical measures of compliance. While this approach can often seem very pragmatic, it is also limited in the scope of ethical dilemmas that it can address. I offer an alternative which places less emphasis on the development, or ‘training, process itself.

Presentation #B59

College: Humanities

School / Department: Linguistics

Email: britta.bolander@utah.edu

Research Mentor: Aniello De Santo

Uncovering the Red Face Palm – A Decolonial Lens into MMIW

Presenter Name: Leslie Rodriguez

The purpose of this study is to raise awareness surrounding the MMIW movement and the impacts it holds on Native American/ American Indian women in the state of Utah. The MMIW phenomenon has held a

catastrophic impact across the North American continent spanning from the United States and Canada (Amnesty, 2007). Sexual, physical violence, disappearances, and homicides involving these women and girls are examples of the crimes that committed against them.

Presentation #B60

College: Cultural & Social Transformation

School / Department: Ethnic Studies

Email: u1293545@umail.utah.edu

Research Mentor: Elizabeth Archuleta

The Student-Parent Dilemma

Presenter Name: Xochitl Juarez

I am working on student-parent research trying to find out how much support student-parents receive from the University of Utah. This project is intended for student-parents, staff, faculty, and professors who work at the University of Utah. The intention is to shed light on issues that student-parents experience when navigating college. This will lay the groundwork for further research as it relates to this population which could create solutions to issues stated by student-parents.

Presentation #B61

College: Social & Behavioral Science

School / Department: Sociology

Email: estrella.juarerz@utah.edu

Research Mentor: Theresa Martinez

Examining Potential Micro-Residue Contamination on Ground Stone Tools in Buried Contexts Using Starch Granule Analysis.

Presenter Name: Caston Draper

The distinctive characteristics of starch granules found on ground stone tools in buried contexts can provide key insights into past human lifeways including food processed and eaten, migration patterns, and land investment. Little is known however of the potential for the soils surrounding these tools to contaminate the deeper interstitial matrix of the artifact. This research compares starches from the surface of the artifact to those in the deeper interstitial matrix to assess this question.

Presentation #B62

College: Social & Behavioral Science

School / Department: Anthropology

Email: u1331847@utah.edu

Research Mentor: Stefania Wilks

Utilizing 3D Scanning and Printing to Create Teaching Tool Kits for Greater Scientific Outreach

Presenter Name: Jessica Parsons

I am learning how to use 3D technology to create models of various animal skeletons. The purpose of this research is creating realistic teaching aids that can be used in elementary classrooms, without risking the safety or integrity of the actual specimen. The overall goal of my project is to create tools that are widely accessible for

students of all ages and abilities, and increase scientific awareness and outreach in my community.

Presentation #B63

College: Social & Behavioral Science

School / Department: Anthropology

Email: u1342355@utah.edu

Research Mentor: Kasey Cole

Prevalence in Housing in Relation to Changes in Climate Over Time

Presenter Name: Ana Chavez

I study the relationship that exists between climate changes and density of housing structures in south-central Utah. The goal is to better understand population patterns caused by climate change to further understand what it could mean in the future where extreme weather will be more likely especially in areas where extreme climate will be strongest.

Presentation #B64

College: Social & Behavioral Science

School / Department: Geography

Email: ana.chavez@utah.edu

Research Mentor: Alana Welm

On Account of Sex: Applying the Attitudinal Model to Sex Discrimination Cases in the Supreme Court

Presenter Name: Meredith Jenkins

To contribute to the debates between the attitudinal and strategic models of judicial decision-making, this project

seeks to examine ideology's influence on Supreme Court decisions in sex discrimination cases. It also considers the impact of a justice's background and strategic concerns, like case salience and public opinion.

Presentation #B65

College: Social & Behavioral Science

School / Department: Political Science

Email: u1305915@utah.edu

Research Mentor: Michael Dichio

Utah Radon Lab Community Drive

Presenter Name: Gavin Ballard, Molly Ballard, Andrew Clothier, Kaitlyn Ricks, Chiana Rossiter

During winter 2023-2024 the Utah Radon Lab conducted a community drive to raise awareness about radon and spread resources to university community members. The primary function of the radon drive was to distribute free test kits so that we could gather more information about radon in our community. Through tabling events and informational sessions, our team distributed over two hundred test kits to students. Our research is ongoing, but we will present our most recent findings from the drive.

Presentation #B66

College: Social & Behavioral Science

School / Department: Political Science

Email: u1315943@utah.edu

Research Mentor: Tabitha Benney

Post-intervention Assessments in the Couple-Based Diabetes Prevention Pilot Trial

Presenter Name: Terry Kim

The PreventT2 Together pilot trial began in January 2023 to examine whether delivering the adapted National DPP curriculum to couples will lead to greater engagement with lifestyle change and maintenance, compared to delivering to only the high-risk partner. Upon completion of the pilot trial in January 2024, our team conducted post-intervention assessments with all 12 participating couples (24 partners). This study implies the potential of a couple-based approach to implement the National DPP.

Presentation #B67

College: Social & Behavioral Science

School / Department: Psychology

Email: u1375089@utah.edu

Research Mentor: Katie Baucom

Effect of Connectedness to Nature and Living Environment on Cognition and Affect after Exposure to Nature

Presenter Name: Hailey Sherman

This analysis project explores how participants' performance on the Attention Network Task, their ratings of their mood on the PANAS, and their EEG measures before and after a nature or urban walk are related to their score on the Connectedness to Nature Scale and their reported living environment. The results of this analysis

provide useful information about how generalizable the beneficial effects of nature are to the population.

Presentation #B68

College: Social & Behavioral Science

School / Department: Psychology

Email: hailey.sherman@utah.edu

Research Mentor: Amy McDonnell

Self-control of Adults with Type 1 Diabetes and Their Perceptions of Partner Support.

Presenter Name: Ben Creer

This project is looking at the ways in which self-control has an effect on perceived partner support in patients with type 1 diabetes. The data comes from a study in which patients were in a romantic partnership in which at least one partner had type 1 diabetes.

Presentation #B69

College: Social & Behavioral Science

School / Department: Psychology

Email: u1144896@uemail.utah.edu

Research Mentor: Cynthia Berg

Building a Data Processing Pipeline for Tissue and Pathway Activation Modeling in Amygdala-Mediated Memory Modulation

Presenter Name: Griffin Light

Stimulation of the human amygdala has been shown to enhance memory in humans. However, results are inconsistent. Several factors have been examined to

determine what leads to successful memory enhancement and a currently promising avenue of research leverages tools present in Lead-DBS, a MATLAB-based software toolbox, to visualize volume of tissue and neural pathway activation. This project constructs a viable and reusable pipeline for future analyses in Lead-DBS, paving the way for future work.

Presentation #B70

College: Social & Behavioral Science

School / Department: Psychology

Email: u1359384@uemail.utah.edu

Research Mentor: Cory Inman

Aging and Prospective Memory Across a Lifespan: Differences in Reliance on Familiarity

Presenter Name: Yanet Matos Roig

Prospective Memory refers to remembering to do something in the future, this type of memory seems to decay as we age. Familiarity is a cognitive aid we use when in need to recall something. However, it leads to incorrect judgments. This study hypothesizes that when older adults are asked to complete a Prospective Memory task, they will not perform as well as younger adults due to their increased reliance on familiarity.

Presentation #B71

College: Social & Behavioral Science

School / Department: Psychology

Email: u1422311@utah.edu

Research Mentor: Kristina Rand

A Positive Outlook on Dependency

Presenter Name: William Leary

In the past, dependency has been almost exclusively discussed as a harmful phenomenon. Recently, more research has started to mention the existence of positive interdependency. However, the characteristics of beneficial dependency have not yet been identified. This project aims to begin this work. It is proposed that beneficial dependency will be highly correlated with Social Safety while detrimental dependency will be correlated with Perceived Burdensomeness.

Presentation #B72

College: Social & Behavioral Science

School / Department: Psychology

Email: u1302556@uemail.utah.edu

Research Mentor: Lisa Diamond

The effect concussions have on sensory integration and spatial updating

Presenter Name: Gabriel Holm

Individuals with concussions report dizziness and imbalance, possibly due to impaired central sensory integration. The goal of this project is to demonstrate how concussions affect sensory integration and spatial updating for complex navigation. We hypothesize that concussions interfere with the central integration of these senses. Results from this study aren't conclusive yet as data is still being collected this semester, spring 2024.

Presentation #B73

College: Social & Behavioral Science

School / Department: Psychology

Email: u1345819@umail.utah.edu

Research Mentor: Sarah Creem-Regehr

Safe Zone Training for Professional Health Students

Presenter Name: Brekke Pattison

The purpose of this study is to determine how to best provide education on patient care of LGBTQIA+ and gender diverse patients to help minimize the biases and barriers that these groups face while obtaining medical care. Working alongside medical students and the Office of Health Equity, Diversity, and Inclusion, a series of workshops designed to help work through different aspects of identity, diversity and intersectionality.

Presentation #B74

College: Social & Behavioral Science

School / Department: Sociology

Email: u1194204@utah.edu

Research Mentor: Claudia Geist

The Reproductive Beliefs and Habits of Former Believers of the Church of Jesus Christ of Latter-day Saints ("Ex-Mormons" and "PIMOs")

Presenter Name: Lauren Rives

Previous research has theorized why those of the Latter-day Saint (LDS, Mormon) tradition have distinct pronatalist behaviors. Additional research has found that early life religious exposures can help internalize

pronatalist schemas. This study applies such research to the ex-Mormon and PIMO (physically in, mentally out) populations in the US to gather a baseline of their reproductive beliefs and habits to see if former believers of the faith still maintain distinct pronatalist behaviors.

Presentation #B75

College: Social & Behavioral Science

School / Department: Sociology

Email: u0718059@utah.edu

Research Mentor: Claudia Geist

Characterizing the Influence of Industrial Fluxes on Aluminosilicate Glass Systems using Spectroscopic Analysis Techniques

Presenter Name: Colin Poly

The glass formation boundary delineates a chemical range in which glaze compositions tend to maintain their amorphous structure when cooled from a molten state. Complex glaze compositions with multiple fluxes present challenges that burdens glaze development. This project explores how varying compositions of fluxes in an aluminosilicate system affects glass formation. Data collection is conducted through spectroscopic analysis techniques including Infrared, X-Ray Fluorescence, and Raman.

Presentation #B76

College: Fine Arts

School / Department: Art & Art History

Email: u1255159@utah.edu

Research Mentor: Ernest Gentry

Exploring the Radicalization of Youth in Alt-Right Spaces through Screenwriting.

Presenter Name: Michael Palmer

I researched how young people are trapped in alt-right spaces by fearmongering, then sought to create a screenplay empathizing with a young neo-Nazi who has never known any other support. When he's given a chance to escape, can he take it?

Presentation #B77

College: Fine Arts

School / Department: Film & Media Arts

Email: u0897852@utah.edu

Research Mentor: Hubbel Palmer

Hyperosmolarity-mediated activation of NFAT5 plays a dual role in the kidney

Presenter Name: Xander Kraus-McLean

Looked at the role of NFAT5 in renal epithelial cells and macrophages. Using a Crispr NFAT5 knockout line of IMCD cells, I did experiments looking at the survival of IMCD NFAT5 knockout cells and Wt IMCD cells and qPCR looking at transporter expression in varying osmolarities and osmolites. Then performed qPCR of RAW cells, using si-rna to knock down NFAT5 expression.

Presentation #B78

College: Medicine

School / Department: Internal Medicine

Email: u1343491@utah.edu

Research Mentor: Brandi Wynne

Cargo Sorting at the Synapse

Presenter Name: Hetvi Patel

Adaptor protein complexes 1,2,&3 are localized to the endosome in a neuron. Each is responsible for some sort of cargo sorting and vesicle recycling. The research is meant to show the importance and possible function of the protein complexes.

Presentation #B79

College: Science

School / Department: Biological Sciences

Email: u1191654@utah.edu

Research Mentor: Erik Jorgensen

An Examination of the Barriers Restricting Adolescents' Equal Participation in Physical Activity across the United States

Presenter Name: Sydnee Barton

Despite well researched and known benefits of physical activity (PA) participation, a large disparity in adolescent participation exists in the U.S. The inequity of PA participation among genders, races, and socioeconomic status is extremely visible in data collected across high schools in the U.S. In this thesis, the possible contributing factors, including geographic location, socioeconomic status, accessibility to organized sports,

psychological factors, societal norms, etc. are examined.

Presentation #B80

College: Health

School / Department: Health, Kinesiology, and Recreation

Email: u1114451@utah.edu

Research Mentor: Arwen Fuller

Patient-Specific Computational Fluid Dynamics Modeling of Embolic Strokes

Presenter Name: Nathan Sudbury

Approximately one-third of all ischemic strokes are interpreted as embolic strokes of undetermined sources (ESUS), which means that there is no conclusive cause of the stroke. The purpose of this study is to use computational fluid dynamics (CFD) to identify critical biomechanical parameters that relate to ESUS and will improve physicians ability to identify stroke sources.

Presentation #B81

College: Engineering

School / Department: Mechanical Engineering

Email: u1230449@utah.edu

Research Mentor: Amir Arzani

East Idaho Ethnic Minorities Oral History Project

Presenter Name: Sujata Gandhi

The East Idaho Ethnic Minorities Oral History Project is

a collection of 100 oral history interviews conducted with ethnic minorities in the east Idaho area from October 2023 to February 2024 by myself and archived by the Museum of Idaho. The project serves to diversify the collective narrative and bridge historic and contemporary experiences of ethnic minority communities. The poster will be providing an analysis of methodologies and themes seen in the interviews.

Presentation #B82

College: Humanities

School / Department: History

Email: u1437922@uemail.utah.edu

Research Mentor: Matthew Basso

4.

ORAL PRESENTATIONS

10:45AM - 12:15PM

Tuesday, Apr 9th | 10:45AM - 12:15PM

Collegiate Room

Moderator: Copeland

Metamaterial-based Robots for Surgical Applications

Presenter Name: Britton Jordan

Mechanical metamaterials are materials which do not exist in nature but are rather purposefully constructed to exhibit certain mechanical properties. Manipulators composed of these materials are performant while remaining simple and elegant.

However, the motion capability of the manipulator is encoded in its physical composition and cannot be changed. We present multi-modal metamaterial-based robot prototypes which can switch between the behaviors found in two different metamaterials.

College: Engineering

School / Department: School of Computing

Email: u1064972@utah.edu

Research Mentor: Alan Kuntz

A Jupyter Notebook Educational Repository

Presenter Name: Nicholas Baker

I am creating a repository of jupyter notebooks for the chemical engineering department to use. These notebooks will make solving problems and coding easier for the students. It will also be a framework to be updated as new information needs to be added. It will be a resource for students to use and hopefully make their lives easier, and encourage them to maintain using code throughout their college career.

College: Engineering

School / Department: Chemical Engineering

Email: u1242325@utah.edu

Research Mentor: Tony Saad

Unraveling the Q system function in prokaryotes

Presenter Name: Peyton Leyendecker

Here, we explored the QF transcription factor activation mechanism in prokaryotes by characterizing the behavior of a fusion protein (TetR-QFAD) consisting of the tetracycline repressor (TetR) and the QF activating domain (QFAD) downstream of the T7 promoter. We demonstrate that when placed downstream of the T7 promoter, TetR-QFAD functions as a repressor and an activator depending on the presence of aTc.

College: Engineering

School / Department: Bioengineering

Email: u1311463@utah.edu

Research Mentor: Tara Deans

The Cause of Excess Magmatism in the Northern Atlantic Margin

Presenter Name: Autumn Hartley

Large Igneous Provinces are known to be prominent drivers of climate change in Earth's past. When the Paleocene-Eocene Thermal Maximum occurred, the North Atlantic Igneous Province was forming. In this project, the causes behind the formation of this province are examined through the lens of geothermometry, melting regimes, and composition of the mantle source using data from the International Ocean Discovery Program's Expedition 396.

College: Mines & Earth Sciences

School / Department: Geology and Geophysics

Email: u1341390@utah.edu

Research Mentor: Emily Cunningham

Tuesday, Apr 9th | 10:45AM – 12:15PM

Parlor A

**Explaining the relationship between galaxy sizes
and their spatial distribution.**

Presenter Name: Joshua Hill

Galaxies come in different shapes and sizes. One hypothesis is that the sizes of galaxies depend on the properties of their surrounding environments. This hypothesis makes a specific prediction on how galaxies of different sizes are spatially distributed in the Universe. Here we examine this prediction and provide a physical explanation of the relationship between the sizes of galaxies and their spatial distribution. This work will allow us to better understand the validity of the hypothesis.

College: Science

School / Department: Physics & Astronomy

Email: u1190961@uemail.utah.edu

Research Mentor: Yao-Yuan Mao

El Teatro: Latinidad On Broadway

When one thinks of Latine representation in musical theater, there are two common works cited: West Side Story and In The Heights. But of course, given the long and rich history of theatre, there are far more examples that are just simply not given the proper attention they deserve. This project aims to bridge that gap in research

and expose audiences to the Latino stage: who's involved, where it's been, where it's heading, and the sociocultural implications that these shows represent.

Presenter Name: Steffan Perez-Velez Solis

College: Fine Arts

School / Department: School of Music

Email: u1310578@utah.edu

Research Mentor: Elizabeth Craft

Counterfactual Utilitarianism: A New Metaphysical Approach to Consequentialist Ethics

Presenter Name: Milo Yeates

I defend and apply a new ethical framework: counterfactual utilitarianism. I explain how it prescribes that we evaluate the morality of actions and show that (because it takes into account the pragmatic nature of identity and the incoherence of ethical comparisons between existence and nonexistence) it produces moral conclusions distinct from those of other forms of utilitarianism. I apply this framework to the non-identity problem and the the ethics of embryo selection vs gene editing.

College: Humanities

School / Department: Philosophy

Email: u6022319@uemail.utah.edu

Research Mentor: Matt Haber

PART III

**SESSION III -
1:00PM-2:30PM**

5.

POSTER PRESENTATIONS

1:00PM-2:30PM

Three-Dimensional Mapping of Coronary Vasculature Geometries

Presenter Name: Aksel Anderson

Cardiovascular disease is the leading cause of death globally, and one of the most impactful subsets is coronary artery disease. Understanding the geometric structure of the heart's vascular network can provide insight into the development of coronary artery disease. However, these vasculature geometries are often limited to the primary branches of the coronaries. My study developed a method to efficiently obtain subject-specific, high-resolution vasculature geometries.

Presentation #C1

College: Engineering

School / Department: Bioengineering

Email: u0577148@utah.edu

Research Mentor: Rob MacLeod

Signal Processor for Electrogram and Electroanatomic Data (SPEED)

Presenter Name: Rui Jin

The electrocardiogram is the most commonly used tool to access cardiac conditions, such as heart failures. These signals are ambiguous, so many cases require catheter-based measurements from the heart in mapping studies. OpenEP, PFEIFER and map3d are signal processors that parse data into accessible open-source formats, with visualization and analysis. My research integrates these software packages to exploit the benefits and provide a new tool for clinicians and researchers in heart disease.

Presentation #C2

College: Engineering

School / Department: Bioengineering

Email: u1312291@utah.edu

Research Mentor: Rob MacLeod

Recording and manipulating neural activity in human brain organoids

Presenter Name: Jude Werth

This research project has two goals, to model the effect of Glioblastoma in brain organoids and to design a platform capable of recording dozens of organoids. Organoids are 3D models of the human brain derived from stem cells. We recorded data from control organoids and organoids

cocultured with GBM cells, this project looks to quantify the difference between the two. Additionally we look to design a recording dish which can record dozens of organoids.

Presentation #C3

College: Engineering

School / Department: Bioengineering

Email: u1373453@utah.edu

Research Mentor: Jan Kubanek

Deep Learning for Thermal-RGB Image-to-Image Translation

Presenter Name: Emma Wadsworth

The contributions of this research are: (1) creating the largest and most diverse publicly available dataset of TIR-RGB image pairs, and (2) demonstrating efficient translation between TIR and RGB image modalities across diverse global priors

Presentation #C4

College: Engineering

School / Department: Electrical and Computer Engineering

Email: u1081622@utah.edu

Research Mentor: Rajesh Menon

Artificial Organ Transplants

Presenter Name: Luna Ahn, Louelle Cho, Stella Oh

More than around 100,000 people are waiting for lifesaving organ transplants, but the number of organs

is limited, and the number of people who need artificial organs is increasing. Since there are still technical problems with artificial organs that many people do not benefit from, we are going to do research to develop technical problems of artificial organ and discuss about the further benefits if these problem solved.

Presentation #C5

College: Engineering

School / Department: Electrical and Computer Engineering

Email: u1396721@utah.edu

Research Mentor: Hanseup Kim

Direct Numerical Simulation of Flame Propagation in Hydrogen and Ammonia Mixtures

Presenter Name: Joey Lee

The combustion of hydrogen/ammonia systems is an ongoing area of research, and is not well-understood yet. Through direct numerical simulations of the combustion of these chemical mechanisms, we can predict the behavior of these processes. My research currently is to compare the robustness of various simulation mechanisms to better understand which models would be preferable for future research.

Presentation #C6

College: Engineering

School / Department: Mechanical Engineering

Email: joey.s.lee@utah.edu

Research Mentor: Alex Novoselov

Development of Two-Chambered Kidney-On-A-Chip

Mimicking the Glomerular Filtration Barrier

Presenter Name: Jiwon Lee

Fabricating two-chambered kidney chip and culturing cells to form the glomerular filtration barrier on the chip.

Presentation #C7

College: Engineering

School / Department: Mechanical Engineering

Email: u1267003@utah.edu

Research Mentor: Jungkyu (Jay) Kim

Comparison of Water Meniscus on Hydrophobic and Hydrophilic Surfaces

Presenter Name: Milo Birdwell

This research aims to see how varying humidity will affect the formation of a water meniscus between a tip and surface. Through a relative humidity range of 0-60%, a hydrophilic tip on a quartz tuning fork, QTF, is brought down to contact and retracted from both a hydrophobic surface and a hydrophilic surface. Recording both the frequency shift and voltage amplitude of the QTF, future research can find how friction is affected between these surfaces at differing humidities.

Presentation #C8

College: Engineering

School / Department: Mechanical Engineering

Email: u1310925@utah.edu

Research Mentor: Keunhan Park

Neutronic and Thermal-Hydraulic Modeling of an

Inverted Stable Salt Reactor

Presenter Name: Nate Brown

The safety of traditional nuclear reactors is dependent on constant cooling. The Inverted Stable Salt Reactor (ISSR) design can reduce the dependency on coolant circulation, decrease economic costs, reduce nuclear waste stockpiles, and reduce the need for active supervision. The goal of this research is to determine the viability for the ISSR design to self-regulate its temperature by producing natural convection currents in a bulk fuel container.

Presentation #C10

College: Engineering

School / Department: Mechanical Engineering

Email: u1066715@utah.edu

Research Mentor: Pania Newell

Decoding DNA: Exploring the Impact of Tokenization on Genomic Language Models

Presenter Name: Anisa Habib

The language-like structure of DNA suggests it may be possible to use LLMs to extract meaningful insights from genomic data. Currently there is no standard tokenization method or set of fine tuning tasks for genomic language models. Our strategy has been to fine tune multiple foundational models on all of their existing tasks. Additionally, we performed a preliminary investigation on whether an LLM can accurately identify the locations of prophage sequences integrated in the bacterial genome.

Presentation #C11

College: Engineering

School / Department: School of Computing

Email: anisa.habib@utah.edu

Research Mentor: Hari Sundar

A Metagenomic Analysis of the Microbial Composition of *Apis mellifera* Pollen Preserves throughout the Foraging Season

Presenter Name: Sydney Larsen

In this research project, we attempt to leverage the benefits of rapidly advancing DNA sequencing techniques to characterize how the microbial composition in bee foraged pollen provisions change in relation to shifts in foraging preferences. This research describes general patterns of plant foraging behaviors for multiple hives across a single foraging season as well as the variability of microbial composition associated with this foraging behavior.

Presentation #C12

College: Science

School / Department: Biological Sciences

Email: u1297291@utah.edu

Research Mentor: Joshua Steffen

One Step Protein Purification via the Type 3 Secretion System

Presenter Name: Ty Mellor

By co-opting the type 3 secretion system in *Salmonella*, we can secrete proteins of interest into the growth

medium. This can significantly reduce costs and time required for purification of proteins produced in bacterial hosts.

Presentation #C13

College: Science

School / Department: Biological Sciences

Email: carlty.mellor@utah.edu

Research Mentor: Fabienne Chevance

Investigating the Neural Networks of Learning in *Drosophila melanogaster*

Presenter Name: Dua Azhar

The mushroom body of the *Drosophila melanogaster* brain is necessary for learning, but how it functions remains unknown. *D. melanogaster*'s mushroom body neurons and input projection neurons have connections that are random and biased-in which some projections neurons connect more than others-allowing the fly to potentially prioritize the learning of particular odors. I am investigating the functional consequences of these biases to understand the biological role they play for the fly.

Presentation #C14

College: Science

School / Department: Biological Sciences

Email: u1312151@utah.edu

Research Mentor: Sophie Caron

Does size matter? The relationship between body size and grooming time in birds

Presenter Name: Nicole Amedee

Grooming behavior is widespread among animals. Grooming takes time and energy away from other activities, such as foraging and reproduction; however, devoting too little time to grooming is also costly. The optimum amount of time an animal grooms may be influenced by body size. I used focal behavior sampling to measure the relative time budgets of 24 captive bird species, comprising 12 phylogenetically independent species pairs of varying body sizes.

Presentation #C15

College: Science

School / Department: Biological Sciences

Email: u1292571@utah.edu

Research Mentor: Dale Clayton

Locating the BPS Family Proteins Using Molecular In-Fusion Cloning and Confocal Microscopy

Presenter Name: Danaya Geer

We want to see if localization of the BPS2 protein is different in the Col-0 and Apost-1 accessions of Arabidopsis. We will fuse fluorescent proteins to the Col-0 and the Apost-1 accessions of BPS2 and monitor where fluorescence shows up on an organismal and cellular level. We will also use biotinylation to identify BPS2 protein-protein interactions. We also want to look at already

created BPS1-YFP fusions under a confocal microscope and identify in which cells the BPS1 protein localizes.

Presentation #C16

College: Science

School / Department: Biological Sciences

Email: u1318223@utah.edu

Research Mentor: Leslie Sieburth

Live imaging of the chloroplast RNA polymerase complex

Presenter Name: Madi Dean

Green plants are the essential organisms for a functional ecosystem on earth because of the photosynthesis that produces oxygen and food from light and atmospheric carbon dioxide, which occurs in chloroplasts. Chloroplast biogenesis requires the expression of photosynthesis-associated genes that are transcribed by chloroplast RNA polymerase complex called the PEP (Plastid-encoded RNA Polymerase). My research goal is to generate reporter lines that enable live imaging of the PEP complex in plants

Presentation #C17

College: Science

School / Department: Biological Sciences

Email: u1350720@utah.edu

Research Mentor: Chan Yul Yoo

Investigating Molecular Features and the Regulatory Mechanism of NCP during Plant Evolution

Presenter Name: Scott Perkins

Chloroplast in plants is considered to originate from cyanobacteria through endosymbiosis. In *Arabidopsis thaliana*, the model species, NUCLEAR CONTROL OF PEP ACTIVITY (NCP) gene is essential for chloroplast biogenesis. We have discovered that light controls alternative transcription start site of the NCP gene, and that NCP protein shows chaperone activity. My research is to investigate how these molecular features and the regulatory mechanism of NCP have been acquired during plant evolution.

Presentation #C18

College: Science

School / Department: Biological Sciences

Email: scott.perkins@utah.edu

Research Mentor: Chan Yul Yoo

Thermostability of DNA Repair Enzyme MUTY

Presenter Name: Kenzie Montzingo

This project was devised to determine whether or not DNA repair enzyme MUTY is thermodynamically stable. In the Horvath lab many of the reactions and experiments run put the enzyme in environments of 20 to 60 degrees Celsius. Therefore, in order to determine if the temperature at which the experiments are being conducted has an effect on the enzyme which could affect

its ability to perform, I ran a glycosylase assay at each temperature and several time points. This data is important to know so that when running future experiments, we as a lab can be confident that the enzyme is performing consistently.

Presentation #C19

College: Science

School / Department: Biological Sciences

Email: u1289141@utah.edu

Research Mentor: Martin Horvath

**Raman Spectroscopy Characterization of
Antibody-ligand Association at Supported
Phospholipid Bilayers**

Presenter Name: Clista Galecki

This research investigates antibody-ligand chemistry, crucial in the immune response. Stoichiometry and ligand accessibility on porous silica particles analyzed via Raman microscopy, allowing label-free quantification of binding. Silica particles with lipid bilayers enable detection of modest ligand fractions. Density variation influences antibody capture. The use of FAB fragments are used to determine binding stoichiometry of full antibodies.

Presentation #C20

College: Science

School / Department: Chemistry

Email: u1186612@utah.edu

Research Mentor: Joel Harris

Season Safely: Heavy Metal Concentrations in Consumer Grade Thyme

Presenter Name: Rebekah Hardman, Kevin Liebetrau, Hannah Nordhoff

Recognizable spice brands were selected and samples from each brand were prepared for ICP-OES analysis via acid digestion and filtration. Samples were created in triplicate and standards were created to run alongside the samples. The standards created a calibration curve, and the results were compared to FDA suggestions for food and safety to determine each sample's level of risk for consumption, and reported by the amount of heavy metals present in each full container of sample

Presentation #C21

College: Science

School / Department: Chemistry

Email: rebekahhardman9@gmail.com

Research Mentor: Ashlie Kinross

Exploring G-quadruplex binding by the C-terminal Zinc Fingers of the Methyl-CpG Binding Protein ZBTB4 Gabriela M. Eyring, Brandon Leonel Guerra Castañaza Jenkins, Bethany A. Buck

Presenter Name: Gabriela Eyring

ZBTB4 is part of a methyl-CpG binding protein family involved in regulating normal and disease relevant transcription. While the N-terminal zinc fingers (ZFs) are known to provide methyl-specific DNA readout, the role

of the C-terminal ZF domain was undefined. We discovered this domain recognizes G-quadruplex DNA. A combination of solution NMR and electrophoretic mobility shift assays have been used to characterize this binding; which expands understanding of ZBTB4 transcriptional activities.

Presentation #C22

College: Science

School / Department: Chemistry

Email: u0861816@uemail.utah.edu

Research Mentor: Bethany Buck-Koehntop

Synthesis and Testing of Hydrophobicly-Modified Pyridyl-Aza Crown Ethers as Chelators of Rare Earth Elements

Presenter Name: William Lee

We synthesized two variations of crown ether ligands able to separate lanthanide ions from REE solution, a dipyridyl variant and a trisamide variant.

Presentation #C23

College: Science

School / Department: Chemistry

Email: u1414717@utah.edu

Research Mentor: Ryan Stolley

Predicting Winter Fog over Complex Terrain Using Machine Learning

Presenter Name: Grace Liu

Fog forms in high-elevation complex terrain as frequently

as it does over bodies of water but is less understood and harder to predict. Traditional physical and numerical models have a limited ability to represent various conditions associated with fog formation. This study aims to evaluate the effectiveness of machine learning methods in predicting winter fog over complex terrain (e.g., Heber City in Utah). We will utilize ten years of surface meteorological observations.

Presentation #C24

College: Mines & Earth Sciences

School / Department: Atmospheric Sciences

Email: grace.liu@utah.edu

Research Mentor: Zhaoxia Pu

**First associated Theropoda skeleton recovered
from the Straight Cliffs Formation of Southern Utah**

Presenter Name: Justin McKee

UMNH VP 19447, the specimen under study, is found to represent a new taxa of ornithomimid, the oldest in North America, from a unit of geologic time and rock with very few described dinosaurs, and is being described in detail with the available material housed at the Natural History Museum of Utah.

Presentation #C25

College: Mines & Earth Sciences

School / Department: Geology and Geophysics

Email: u1096181@utah.edu

Research Mentor: Randall Irmis

Exercise-Induced Effects on GABA Levels in the Hippocampal and Striatal Regions of the Brain

Presenter Name: Malia McCann

Prior research has shown a beneficial effect of physical exercise on cognitive functioning. However, the neural processes supporting this effect remain poorly understood. This study aims to examine the effect of exercise on GABA levels measured with Magnetic Resonance Spectroscopy (MRS) in brain regions associated with memory. We will test the effect of high intensity interval training (HIIT) on both GABA levels and on the concentration of blood biomarkers of brain plasticity.

Presentation #C26

College: Health

School / Department: Health, Kinesiology, and Recreation

Email: u1338477@uemail.utah.edu

Research Mentor: Genevieve Albouy

Impacts of High Fat Diet Feeding on Weight Gain in Ovariectomized Mice

Presenter Name: Ceyda Ural

As the obese population continues to increase, there are also elevated risks of metabolic dysfunction. Unfortunately, metabolic research is often based on male models, causing a lack of literature involving females and processes like menopause, a natural decline in reproductive hormones. As such, we used a

postmenopausal model (with ovariectomized and non-ovariectomized mice) on two different diets: Normal Chow and High Fat Diet. We then compared changes in body weight and body composition.

Presentation #C27

College: Health

School / Department: Nutrition and Integrative

Physiology

Email: u1283642@utah.edu

Research Mentor: Amandine Chaix

Assessment of Mitochondrial Function in a Mouse Model of Mild Chronic Kidney Disease Induced by High-Fat and High-Salt Diet

Presenter Name: Venisia Paula

Chronic kidney disease (CKD) is a complex disorder that presents substantial challenges in understanding its pathophysiological mechanisms, including mitochondrial alterations. However, there are no established mouse models that recapitulate the CKD phenotype observed in humans. We hypothesized that a high-fat, high-salt diet would induce a mild CKD phenotype and mitochondrial dysfunction in mice.

Presentation #C28

College: Health

School / Department: Nutrition and Integrative

Physiology

Email: u1362760@utah.edu

Research Mentor: Katsu Funai

Acral Melanoma Patient Demographics and Tumor

Genetic Information Used to Predict Treatment Response

Presenter Name: Amy Jamison

In this data analysis project, I analyzed different aspects of patient data from a cohort of Acral Melanoma patients, in order to predict their their response to treatment. Different factors analyzed included: patient demographics, tumor genetic information and biomarkers, and the different lines of treatment that the patients received.

Presentation #C29

College: Medicine

School / Department: Internal Medicine

Email: u1173513@uemail.utah.edu

Research Mentor: Siwen Hu-Lieskovan

Can short-term knee extensor training improve locomotor muscle microvascular function and exercise tolerance in patients with heart failure with preserved ejection fraction?

Presenter Name: Jonah Simmons

In the present study, we have documented improved leg blood flow and vascular conductance responses to passive leg movement and increased locomotor muscle exercise capacity following a 6-week localized knee extensor training intervention in patients with heart failure with preserved ejection fraction. These preliminary data highlight the potential of this novel exercise intervention

to enhance microvascular function and exercise tolerance in this vulnerable patient group.

Presentation #C30

College: Medicine

School / Department: Internal Medicine

Email: u1054230@utah.edu

Research Mentor: Kanokwan Bunsawat

Bridging the Gap: Computational Advancements in Neurobiology Research

Presenter Name: Alan Mo

My research focuses on applying computational methods to enhance understanding of the brain and improve the efficiency of research by bridging computer science with neurobiology. My program is written in PyQt, a platform that abstracts C++ user interface (UI) building to python for seamless UI development. The program will graph statistics and other descriptions from mouse behavioral data based on user input.

Presentation #C31

College: Medicine

School / Department: Neurobiology & Anatomy

Email: u1022249@utah.edu

Research Mentor: Jordan Grammer

Characterizing Neuronal ECM in Culture Using Halo Tagged HAPLN 1

Presenter Name: Jennifer Kim

The goal of this project is to characterize the neuronal

extracellular matrix in culture, using a novel tool H-Link. I helped make mutants of H-Link, which was used in HEK cell transfer assay by my lab mentor. Then, quantification of H-Link intensity in culture was performed in order to see different aggregation in cultured neurons.

Presentation #C32

College: Medicine

School / Department: Neurobiology & Anatomy

Email: u1311467@utah.edu

Inhibiting CDK9 and Autophagy in Pancreatic Cancer

Presenter Name: Isabella Scalise

The majority of PDAC cases arise from mutations in KRAS, a GTPase involved in the MAP Kinase (MAPK) pathway. Inhibition of the MAPK pathway upregulates autophagy, a process in which cells recycle their intracellular components to sustain nutrient demands under stressful conditions and can render targeted therapies ineffective. . We are searching for drugs that are FDA-approved or in clinical trials and modulate autophagy for potential repurposing in novel combinations.

Presentation #C33

College: Medicine

School / Department: Oncological Sciences

Email: u1405349@utah.edu

Research Mentor: Conan Kinsey

Advancements in Gene Therapy Approaches for Treating Vanishing White Matter Disease

Presenter Name: Sophia Peralta

Vanishing White Matter (VWM) disease is a rare leukodystrophy affecting about 1 in every 80,000 births and is characterized by spasticity, speech issues, cognitive deficits, and more. As there is no cure, our research aims to further our understanding of VWM and investigate astrocyte-specific promoters for AAV9 gene therapy in a mouse model. The development of a viable treatment is paramount in offering hope and therapeutic intervention to individuals grappling with this debilitating disease.

Presentation #C34

College: Medicine

School / Department: Pediatrics

Email: u1361161@utah.edu

Research Mentor: Josh Bonkowsky

Electroencephalographic Biomarkers in Patients Receiving Propofol for Treatment-Resistant Depression

Presenter Name: Seth Lunt

I analyzed EEG recordings from patients receiving high-dose propofol sedation to treat Treatment-Resistant Depression (TRD). During treatments patients experience a phenomenon called Burst-Suppression which appears on the EEG. I helped extract and analyze these bursts, and based on the data obtained, different categories of bursts were created to act as electrical biomarkers. These

biomarkers are correlated with patient outcome and are used to further understand TRD and propofol as a treatment.

Presentation #C35

College: Medicine

School / Department: Psychiatry

Email: u1072324@utah.edu

Research Mentor: Brian Mickey

The Determinating Factors of Mental Health Stigma and The Dynamics of Social Influence

Presenter Name: Hannah Berrett

The current study aims to (1) identify factors (i.e. type of social influence and social identity) that relate to mental health stigma that is also associated with the multi-step process of help-seeking behavior, and (2) explore if the specific aspect of age (from social identity) is correlated with ideas surrounding mental health stigma and the help-seeking behavior process.

Presentation #C36

College: Medicine

School / Department: Psychiatry

Email: u1353113@uemail.utah.edu

Research Mentor: Michelle Vo

Investigating the Effects of Microtubule-Stabilizing Treatment on Memory and Potentially Related

Anxiety in Alzheimer's Transgenic Mice

Presenter Name: Anika D'Souza

The aim of this project is to explore whether a conjugate drug of Paclitaxel (PTX), a cancer drug that shows promise in treating AD, decreases anxiety and memory symptom burden in transgenic AD mice, tested through behavioral assays.

Presentation #C37

College: Medicine

School / Department: Radiology & Imaging Sciences

Email: u1296298@utah.edu

Research Mentor: Donna Cross

Suicide Risk and Occupational Hazard

Presenter Name: Hannah Fullmer

This study aims to identify occupations held by suicide decedents at their time of death that made them particularly vulnerable to exposure to hazardous environmental conditions (e.g. at high risk of exposure to smoke, dust, toxic chemicals, high temperatures, etc.). Prior research has identified a link between air pollution and temperature exposures and an increased risk of suicide. Certain occupations such as those located outdoors or those involving mineral extraction may increase suicide.

Presentation #C38

College: Medicine

School / Department: Psychiatry

Email: u1375894@utah.edu

Research Mentor: Amanda Bakian

Creature Comforts: Domesticity and Domestication in Mary Shelley's *Frankenstein* (1818) and Tim Burton's *The Nightmare Before Christmas* (1993)

Presenter Name: Savannah McDaniel

My research compares how the creature in *Frankenstein* and Sally from *The Nightmare Before Christmas* have different relationships with domestic spaces. It looks at how visible features on their body, like their clothes and their eyes, relate to domesticity and domestication. I look at how gender expectations, domestic animality, and evolutionary human domestication are expressed on their body, and I argue that this expression complicates their access to domestic spaces.

Presentation #C39

College: Humanities

School / Department: English

Email: u1274669@utah.edu

Research Mentor: Lisa Swanstrom

Context-Specific Exceptions to Gemination in Japanese

Presenter Name: Z Chodos

Japanese follows a strict pattern wherein the final sound in a word changes to match the first sound in a suffix. With certain suffixes, this pattern is not followed. A word like kak 'write' is expected to become katta when the suffix ta is added, but instead becomes kaita. I looked at processes

of allomorphy and fusion to explain this irregularity. Allomorphy lets the suffix have multiple versions, /ta/ and /ita/, and fusion lets aspects of sounds be preserved when they would otherwise be lost.

Presentation #C40

College: Humanities

School / Department: Linguistics

Email: u1334939@utah.edu

Research Mentor: Aaron Kaplan

Marketplacement: a procurement management recommender system

Presenter Name: Isaak Grettum

This project proposed whether machines can assist in procurement management. It aimed to ensure ethicality in the process and set a precedent for ethics in automation using AI. The project entails a system that scrapes the internet for potential manufacturers using a topic modeler. It then presents the results with additional information to the user. Results are ranked based on distance from the expected point of sale with considerations for environmental/practice certifications.

Presentation #C41

College: Business

School / Department: Operations & Information Systems

Email: u1318238@umail.utah.edu

Research Mentor: Chong Oh

Brujeria Activism

Presenter Name: Perla Rivera

My research topic focuses on demystifying the “bruja”. I want to reconstruct the story of the bruja as an important part of understanding the long-standing oppression against Chicana and Latinx women. Additionally, I want to elevate the voices of scholars and activists who are representing the bruja as a symbol of empowerment and resistance. With my research, I will create a zine that centers brujeria as a spiritual knowledge that is rooted in womxn liberation

Presentation #C42

College: Cultural & Social Transformation

School / Department: Ethnic Studies

Email: u0507622@utah.edu

Research Mentor: Lezlie Frye

Choosing Sides: Examining Trends in Soccer Stories for the Middle Grades

Presenter Name: Whitney Blanchard, Cassidy Lamm, Lilly Schlenker, Halle Taylor

What is the nature of today’s fictional soccer literature for middle grade readers? What is the diversity of characters and settings? What are the common themes? Learn more about the current trends in the US youth soccer novels and the larger picture of sports literature for youth.

Presentation #C44

College: Education

School / Department: Educational Psychology

Email: u1232433@utah.edu

Research Mentor: Lauren Liang

Using PSMC to Reconstruct Historical Levels of Reproductive Skew in Primates

Presenter Name: Grace Heyborne

This project compares chimpanzee and bonobo PSMC models (which predict historical effective population sizes) with expected X/A chromosome ratios (in which effective population sizes differ) to analyze the possibility that PSMC can be used to model historical levels of reproductive skew in primates.

Presentation #C46

College: Social & Behavioral Science

School / Department: Anthropology

Email: u1100249@utah.edu

Research Mentor: Timothy Webster

Man's best friend: Comparative osteology of Canidae species and remains at Nawthis Village, UT.

Presenter Name: Auriana Dunn

This project is a comparative osteology project that compares the bone morphology of a wolf, domestic dogs, coyotes, red foxes, and a kit fox. The comparative was then applied to canid bones recovered from the Nawthis Village archaeological site in Central Utah.

Presentation #C47

College: Social & Behavioral Science

School / Department: Anthropology

Email: u1397762@utah.edu

Research Mentor: Kathryn Sokolowski

**Genomic Analysis of Male Reproductive Skew in
Bornean and Sumatran Orangutans.**

Presenter Name: Gabriel Hammond

Bornean orangutans are less social than Sumatran orangutans. This variation in sociality directly influences the extent to which male orangutans can monopolize reproductive success. This male reproductive skew has different impacts on genetic diversity on the X chromosome compared to the autosomes, leaving a genomic record of male reproductive behavior. Our research uses analysis of published genomes from Bornean and Sumatran orangutans to compare ratios of genetic diversity between the species.

Presentation #C48

College: Social & Behavioral Science

School / Department: Anthropology

Email: u1190698@uemail.utah.edu

Research Mentor: Timothy Webster

**Quantifying Coprophilous Spores linked to
Megafaunal Herbivory in the Biodiverse Fynbos
Biome**

Presenter Name: Bennett Davenport

Classifying the various types of coprophilous (dung-loving) spores from lake cores in the South African Fynbos Biome, and then tracking them over a period of several

centuries to correlate the growth and decline of large herbivore mammal populations.

Presentation #C49

College: Social & Behavioral Science

School / Department: Anthropology

Email: u1411953@utah.edu

Research Mentor: Stella Mosher

During Pandemic Years

Presenter Name: THEODORE BAENDE

Brian 34 and Brittney 32 were suddenly unemployed and filed for bankruptcy in December 2020 when the pandemic began. Brian obtained a new firearm but used it to kill them both and the children as they experienced a foreclosure on their home. Most cases of lethal intimate partner violence occur in victims' residences, where they should feel safe. Firearms were the predominant weapon used for murder suicide. During the COVID-19 lockdown there was a rise in firearm purchases across the nation.

Presentation #C51

College: Social & Behavioral Science

School / Department: Family & Consumer Studies

Email: u1188099@uemail.utah.edu

Research Mentor: Sonia Salari

Reconstructing Paleoclimate and Wildfire History in Sierra de San Pedro Mártir, Baja California, Mexico

Presenter Name: Samuel Enke and Emma Layon

In 2019, a sediment core was collected from Sierra de San

Pedro Mártir, Baja California, Mexico. Using radiometric dating, the core has been used to create an age model, dating back to 8,000 years ago. Currently, a collaborative team is working to analyze proxies for paleoclimate and wildfire history. This research aims to chart prehistoric variation of both ENSO and the North American Monsoon (NAM), and it will inform land management strategies and progressive policy for the broader region.

Presentation #C52

College: Social & Behavioral Science

School / Department: Geography

Email: sam.enke@utah.edu

Research Mentor: Jennifer Watt

Dendrochronology of Utah Juniper

Presenter Name: April Radford

This project explores the use of Utah Juniper in dendrochronology. Because of this species' irregular growth habits, it is traditionally overlooked in tree-ring science. This project both examined stable isotope incorporation and created a continuous chronology of ring-width in West Desert Utah Juniper.

Presentation #C53

College: Social & Behavioral Science

School / Department: Geography

Email: u1325393@utah.edu

Research Mentor: Mitchell Power

SECRETS IN SEDIMENT- UNDERSTANDING LATE GLACIAL TO HALOCENE ECOSYSTEM CHANGE IN THE GREAT BASIN, NEVADA VIA MACROFOSSIL ANALYSIS

Presenter Name: Sean Paton

My research this semester focused on cave sediment analyses from Ladder Cave in Great Basin National Park, using extracted macrofossils to understand climate change in the area since the Late Holocene. Under my mentor I learned about how plant macrofossils tracked change in climate, and was assigned to write a research based summary on the taphonomic processes which affected our sediment matrix. Our results indicate a drying climate coinciding with the retreat of Lake Bonneville ~14,000 ya.

Presentation #C54

College: Social & Behavioral Science

School / Department: Geography

Email: u1431203@utah.edu

Research Mentor: Larry Coats

The Process of Reconstructing Past Fire Regimes

Presenter Name: Maya Upton

Fish Lake, Utah, contains sediment from hundreds of

thousands of years of environmental history in this region. My research includes the analysis of charcoal from a sediment core from Fish Lake to reconstruct fire history throughout this region. This sediment core contains a high-resolution record with charcoal and pollen that are sensitive to climate change. This is valuable information for understanding past climate, disturbance, and how fire regimes have reacted to these previous climates.

Presentation #C55

College: Social & Behavioral Science

School / Department: Geography

Email: U1364122@utah.edu

Research Mentor: Andrea Brunelle

Reconstructing the Paleoclimatology of Utah's West Desert via Sediment Analysis

Presenter Name: Nile Boyer

Analysis of a sediment core from the Utah Testing and Training Range (UTTR) in Utah's West desert was conducted in order to reconstruct the environmental history of the region. Analysis methods included three proxy methods: loss-on-ignition (LOI) testing, magnetic susceptibility testing, and charcoal counting. Once these proxy tests were performed on the core, the data were interpreted and cross-referenced to create a paleoenvironmental reconstruction for this location.

Presentation #C56

College: Social & Behavioral Science

School / Department: Geography

Email: u1195845@utah.edu

Research Mentor: Andrea Brunelle

**Flourishing and connection in the context of
summer camp: A mixed-methods design**

Presenter Name: Shannielle Taylor

This research consists of a mixed-methods design exploring the effects of connectedness on economically disadvantaged adolescents' flourishing in the context of summer camp. In study one, 339 campers completed flourishing and connectedness measures pre- and post-camp, and a hierarchical regression was performed. In study two, 387 alumni camper narratives were coded for evidence of connectedness and flourishing to further illustrate results from study one.

Presentation #C57

College: Social & Behavioral Science

School / Department: Psychology

Email: u0773555@utah.edu

Research Mentor: Rob Lubeznik-Warner

**Investigating Adaptations made by Lifestyle
Coaches: An Implementation Study on Delivering the
National Diabetes Prevention Program to Latine
Adults**

Presenter Name: Haley Parsons

My research investigates the disproportionate impact of Type 2 Diabetes on the Latine population and the failure of the National Diabetes Prevention Program to reach this population in need. An implementation study focused on

the experiences of Lifestyle Coaches delivering the program to Latine populations was conducted. Interviews were structured based on the Consolidated Framework for Implementation Research, and Qualitative Content Analysis was implemented to reach conclusions.

Presentation #C58

College: Social & Behavioral Science

School / Department: Psychology

Email: u1311822@uemail.utah.edu

Research Mentor: Katie Baucom

The Role of Executive Function in Understanding Healthy Eating Among Emerging Adults with Type 1 Diabetes

Presenter Name: Ruth Lopez Villalobos

Type 1 diabetes is a difficult chronic illness for emerging adults to manage as it requires numerous daily tasks including monitoring one's diet to the amount and timing of insulin administration while parental involvement in illness management declines. Executive function, diet, and parental involvement can all affect diabetes management

Presentation #C59

College: Social & Behavioral Science

School / Department: Psychology

Email: u1287876@uemail.utah.edu

Research Mentor: Cynthia Berg

The Psychological Impact of LDS Church Involvement Among LGBTQ+ Individuals

Presenter Name: Brooklyn Rapp

LGBTQ+ individuals face unique challenges, however, there are additional challenges faced by those who were raised in the LDS church. This research aims to understand the diversity of LGBTQ+ individuals' feelings and experiences about church involvement, and to identify key factors that make individuals feel marginalized and stigmatized by their church experiences. The team wants to be able to offer meaningful guidance to LGBTQ+ Mormons and their families about how to promote long-term thriving.

Presentation #C60

College: Social & Behavioral Science

School / Department: Psychology

Email: u1192037@utah.edu

Research Mentor: Lisa Diamond

Testing the reliability of multisensory cue use during navigation in virtual reality.

Presenter Name: Phoenix Hines

Our project uses a triangle homing task in virtual reality to assess how humans use and combine their senses while navigating. We put participants in a virtual reality headset and ask them to complete the homing task. Their responses are recorded and then we use multiple statistical analyses to understand their accuracy, which

sensory cues they're using, and how they're combining them.

Presentation #C61

College: Social & Behavioral Science

School / Department: Psychology

Email: u1218838@utah.edu

Research Mentor: Sarah Creem-Regehr

**Differences in Parent/Child Perspectives
Surrounding Mental Health Within South-Asian
Families in Utah.**

Presenter Name: Shreya Harikumar

The purpose of this study is to explore how intergenerational perspectives about mental health differ from parent to child and the effects of these differences, specifically amongst households with South-Asian immigrant parents and their second-generation children. Through this project, I hope to identify how these perspectives impact family dynamics and the personal mental health of household members.

Presentation #C62

College: Social & Behavioral Science

School / Department: Psychology

Email: shreya08h@gmail.com

Research Mentor: Karen Tao

Maternal Sensitivity and Infant Behavior in the Still-Face Paradigm: A Cross-Cultural Comparison Between Hispanic and White/Non-Hispanic Infants

Presenter Name: Andrew Parker

This study examines 3 research questions. The 1st question is whether there are differences in infant behavior during the Still Face Paradigm for White/Non-Hispanic & Hispanic infants. The 2nd question is whether there are differences in levels of maternal sensitivity during the free-play interactions for Hispanic & White/Non-Hispanic mothers. The 3rd question is if the associations between maternal sensitivity and infant behavior differs for Hispanic & White/Non-Hispanic mother-infant dyads.

Presentation #C63

College: Social & Behavioral Science

School / Department: Psychology

Email: u1403185@utah.edu

Research Mentor: Lee Raby

What Coping Styles Used in Driving Are Effective and Ineffective?

Presenter Name: Aifara Aisa

In this study we have reviewed papers on effective or ineffective ways to cope with driving anger.

Group Member: Amy Do

Presentation #C64

College: Social & Behavioral Science

School / Department: Psychology

Email: u1328932@utah.edu

Research Mentor: Monika Lohani

**Examining maternal emotional dysregulation
associated with variability in infants' RSA
responses to the Still Face Paradigm**

Presenter Name: Amanda Holt

This research involves investigating whether infants exhibit the typical physiological response to the SFP (i.e., a large reduction in RSA levels during the still-face episode followed by partial recovery during the reunion episode) when it is completed at home. Secondly, whether the findings from Gao et al. (2023) indicating that maternal emotional dysregulation is associated with variability in infants' RSA responses to the SFP can be replicated.

Presentation #C65

College: Social & Behavioral Science

School / Department: Psychology

Email: u1309621@utah.edu

Research Mentor: Lee Raby

**Maternal Secure Base Script Knowledge and
Maternal Emotion Regulation as Predictors of Child
Social-Emotional Outcomes**

Presenter Name: Abigail Christensen

This thesis examined the intergenerational consequences of maternal attachment style (as assessed by their knowledge of the secure base script) and maternal

emotion regulation abilities for their children's social-emotional abilities. I hypothesized that mothers with higher secure base script knowledge and fewer difficulties regulating their emotions will have children with fewer emotional and behavioral problems, fewer regulatory difficulties, and more social-emotional competencies.

Presentation #C66

College: Social & Behavioral Science

School / Department: Psychology

Email: u1144867@utah.edu

Research Mentor: Arabella Young

**Beyond Interest and Performance: Investigating
What Additional Information People Ask for while
Making Hypothetical Hiring Decisions**

Presenter Name: Sam Vaca-St Clair

This study used secondary data analysis to investigate the type of additional information people request after given job applicants' profiles with interest and performance information in STEM and Marketing fields. We are especially interested if participants in the workforce seek information regarding how applicants get along with others and if it differed by the interest and performance information provided. Its results will provide implications of what people value in the hiring process.

Presentation #C67

College: Social & Behavioral Science

School / Department: Psychology

Email: u1377018@uemail.utah.edu

Research Mentor: Carol Sansone

Exploring the Role of Counter-spaces in Supporting First-Generation Students in the Context of the University of Utah's Campus Racial Climate

Presenter Name: Alex Higuera

The purpose of this study is to investigate the impact of counter spaces in upholding First-Generation Students amid the University of Utah's campus racial climate. The research emphasis is figuring out how certain places on campus, known as "counter spaces," help First-Generation students. This study will examine the student's experience to measure their views and the effectiveness of counter spaces as a response to campus racial climate. The findings will provide valuable insights into the sign

Presentation Type: Poster

Presentation Format: In Person

Presentation #C68

College: Social & Behavioral Science

School / Department: Psychology

Email: alexh192000@gmail.com

Research Mentor: Paul White

Benefits of Indoor Climbing on Well-being of Young Adults: Perspectives among indoor climbers

Presenter Name: Elsa Osborne

Qualitative interviews of 30 indoor rock climbers who are college aged to study the physical, mental, and social benefits that indoor climbing has on young adults. Thematic analysis is being used to analyze results.

Presentation #C69

College: Social & Behavioral Science

School / Department: Sociology

Email: u1242954@utah.edu

Research Mentor: Akiko Kamimura

Branching Out: A Study of Residents' Urban Tree Preferences in Salt Lake City

Presenter Name: Emma Glende

Urban forests play an important role in urban ecosystems by providing a variety of ecological, socio-economic, aesthetic, and health benefits. Consequently, I have chosen to focus my Honors thesis in Urban Ecology and Environmental & Sustainability Studies on better understanding residents' tree preferences within the urban sphere. This understanding is vital for effective urban forest management and planning.

Presentation #C70

College: Architecture & Planning

School / Department: City & Metropolitan Planning

Email: emmaglende@gmail.com

Research Mentor: Alexandra Ponette-González

Enhancing Heart Rate Variability: An Examination of Visual and Identity Stimulus Applications"

Presenter Name: Pablo Cruz-Ayala

The undocumented immigrant population in the U.S. confronts challenges like socioeconomic adversity, social stigmatization, and limited access to essential services, jeopardizing their well-being. This study explores how

immigrant-specific artwork positively influences heart rate variability (HRV), contributing to emotional well-being. Practical implications involve integrating such art therapies in public spaces for accessible therapeutics.

Presentation #C71

College: Fine Arts

School / Department: Art & Art History

Email: u1220149@utah.edu

Research Mentor: John Erickson

SYZYGY: An Eclipse of the Self

Presenter Name: Mickayla Koday

In this creative research project, I am developing a series of images, a narrative which I will present in book form. In this work I will reflect on my personal, intellectual, and artistic growth in my years studying art at the University of Utah. With this project, I have analyzed my own experiences and illustrated the resulting feelings, themes, and visuals that have become the foundation for my own work.

Presentation #C72

College: Fine Arts

School / Department: Art & Art History

Email: u1229638@utah.edu

Research Mentor: Maureen O'Hara Ure

Investigating the Interaction of Sex and Trauma Type on Veteran PTSD Symptom Reduction via Evidence-Based Cognitive Processing Therapy

Presenter Name: Cosette Pryor

PTSD is common among Veterans, causing adverse symptoms. Treatments like Cognitive Processing Therapy (CPT) are helpful in reducing symptoms, but the literature lacks consensus on demographic factors that may influence treatment outcomes. While such characteristics do not consistently predict the roles of different characteristics, they may interact, influencing symptom levels and treatment retention. This study explores how sex and trauma type interact to predict treatment response in Veterans.

Presentation #C73

College: Medicine

School / Department: Psychiatry

Email: u1266315@utah.edu

Research Mentor: Erika Roberge

Quaking Aspen Pathogen Defense in the Presence of Climate Change Related Drought

Presenter Name: Allie Perkins

The declining population density of iconic Aspen trees in the mountain West is related to climate change induced drought. My research aims to find the mechanisms between this drought stress and microbial diseases—especially ones that have been previously observed to be unharmed. Through both controlled garden and field

experiments across Utah & Colorado, my study system aims to comprehensively evaluate the impact of drought exposure on pathogen abundance and chemical defenses in aspen trees.

Presentation #C74

College: Science

School / Department: Biological Sciences

Email: allison.perkins@utah.edu

Research Mentor: Talia Karasov

The Importance of Ethics in a Technological Age

Presenter Name: Chris Eggert, Alek Shope, Panna Sun, Haijun Zhang

Our research project explores the importance of ethics in our current age. Today, we can see technology growing at an exponential rate. With this explosive technological growth, new ways to negatively exploit technology appear as well. Our research explores ethical issues that arise with the growth of technology. Our goal is to explore solutions to these growing issues by examining how ethics can be incorporated in the design of technology systems as well as the importance of privacy policies.

Presentation Format: In Person

Presentation #C76

College: Business

School / Department: Operations & Information Systems

Email: u1307346@utah.edu

Research Mentor: Sankar Srinivasan

Investigating the Role of the Protein Interactions

Domains of UBR5 in Mantle Cell Lymphoma

Presenter Name: Cassie Burdick

To decipher the role of the MLLE and HECT domains in MCL, we will knockout the MLLE and HECT domains in MCL cell lines, JEKO1 and Mino cells by CRISPR/Cas9. Utilizing mass spectrometry techniques, we will define domain interactions and protein abundance changes specifically dependent on the MLLE and HECT domains. Using the information, we will form a better understanding of the role of UBR5 in MCL with the goal of providing insights to mantle cell lymphoma transformation and progression.

Presentation #C77

College: Medicine

School / Department: Hematology

Email: u1312216@uemail.utah.edu

Research Mentor: Shannon Buckley

Impacts of COVID-19 on Intimate Partner**Homicide-Suicide and Familicide-Suicide between 2018-2023**

Presenter Name: Lauren Shields

This project included the collection of Intimate Partner Homicide-Suicide (IPHS) and Familicide cases between 2018-2023. The study examines the effect of COVID-19 on the frequency and severity of IPHS and Familicide with a special emphasis on

partnerships that had children (regardless of whether the children were killed in the event or not). During the pandemic an increase in firearm purchases, along with societal and financial stressors put women and children in vulnerable positions.

Presentation #C78

College: Social & Behavioral Science

School / Department: Family & Consumer Studies

Email: u0846505@utah.edu

Research Mentor: Sonia Salari

Dental Anxiety and its Contributors in Underserved and Uninsured Populations

Presenter Name: Dustin Breakfield, Pam Amornnimit, Sia Chauhan

Free clinics are nonprofit organizations that provide healthcare services to underserved and uninsured individuals at little or no charge. This quantitative study assesses the free clinic patients' perspective on health and health services, particularly oral and cardiovascular health, to improve the health of free clinic patients, the quality of care, and services at the clinic through intervention and research

Presentation #C79

College: Social & Behavioral Science

School / Department: Sociology

Email: u1097772@utah.edu

Research Mentor: Akiko Kamimura

Knowledge about Sudden Cardiac Arrest and Heart Attacks Among Free Clinic Patients

Presenter Name: Pam Amornnimit, Dustin Breakfield, Sia Chauhan

Free clinics are nonprofit organizations that provide healthcare services to underserved and uninsured individuals at little or no charge. This quantitative study assesses the free clinic patients' perspective on health and health services, particularly oral and cardiovascular health, to improve the health of free clinic patients, the quality of care, and services at the clinic through intervention and research

Presentation #C80

College: Social & Behavioral Science

School / Department: Sociology

Email: u1315937@utah.edu

Research Mentor: Akiko Kamimura

6.

PERFORMANCE 1PM - 2:30PM

Dance Improvisation as a Somatic Healing Tool and Generator of Movement Performance Art

Performer Name: Elle Taylor

The aim of this study was two-fold; utilize a consistent practice of dance improvisation as a somatic tool for healing & self-discovery, and from these practices, to gather movement patterns, sensory experiences, and thematic elements as material to create a collaborative movement art piece to be performed.

What are the foundational somatic principles that we, movement artists can rely upon, as we venture into the vast landscape of creative and healing possibilities that lie in improvisation

College: Fine Arts

School / Department: School of Dance

Email: u1311112@utah.edu

Research Mentor: Molly Heller

7.

ORAL PRESENTATIONS

1PM - 2:30PM

PART IV

POSTER PRIZES

For the Spring 2024 Symposium, students are invited to submit their poster to be considered for up to three poster prizes. Poster prize winners will be recognized at the symposium, receive a monetary prize (check), and have their poster displayed in the library. The J. Willard Marriott Library is excited to showcase the Undergraduate Research Symposia award-winning posters. Each exceptional poster will be displayed in the Level 1 classroom hallway, adjacent to the library café. This high-traffic location will provide our diverse campus community the opportunity to explore the impactful work of the University of Utah's top undergraduate scholars.

Poster prize categories (2024)

- Best in STEM



- Best in Humanities and Fine Arts
- Best in Wellness, Health and Medicine
- Best in Social Sciences
- Best in Interdisciplinary Fields
- Best in Societal Impact
- Best Use of Technology
- Best Citations & Literature Review
- Best Innovative Introduction
- Best Use of Poster Visuals

The Office of Undergraduate Research would like to thank our events manager Shelly Parker. Also vital to the events are the OUR team: Thank you to: Cindy Greaves, KT Finney, Angie Leiva, Jennifer Santiago, and Dr. Annie Isabel Fukushima.

OUR is grateful to this year's sponsors: Maschoff Brennan, and Northrop Grumman.

To learn more about the conference, visit: our.utah.edu