

2019

# 2019 Student Research and Creative Works Symposium Program

Eastern Washington University

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## Recommended Citation

Eastern Washington University, "2019 Student Research and Creative Works Symposium Program" (2019). *2019 Symposium*. 14.  
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# EWU | RESEARCH & CREATIVE WORKS SYMPOSIUM

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## Welcome to the Student Research and Creative Works Symposium

As an Associate Dean of the University College, I would like to welcome you to this year's symposium week. Here at Eastern Washington University, undergraduate/graduate research and creative works take center stage each spring as we celebrate the collaborative work of students and faculty. This symposium brings together some of our brightest and most talented young scholars and artists; we congratulate you on all you have accomplished.

A great deal of effort goes into an event of this magnitude. The university is grateful for the tremendous dedication of faculty and staff mentors and the work of EWU's Student Research and Creative Works Symposium committee. We hope that you will take the opportunity to not only share your own research or creative works, but also participate fully in this Symposium by attending other presentations, creative performances and exhibits, and the keynote presentation.

Undergraduate/graduate research is considered a high impact practice initiative. One of its foremost benefits is the mentoring relationship established between students and faculty to provide advanced opportunities for learning. It is this relationship and the commitment of the faculty mentors that make these projects such an important part of student success. Additionally, it is well recognized that participation in the arts lends itself towards enhanced critical thinking, communication and creativity. Thank you – faculty - for everything you do to support both of these areas.

We are excited you are here and hope you take full advantage of the opportunities to network with, and learn from, the presentations and performances of your fellow students and peers.

Sincerely,

A handwritten signature in cursive script, appearing to read 'C. Lopez'.

Dr. Charles Lopez  
Associate Dean  
University College

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### Learning Outcomes for EWU's Student Research and Creative Works Symposium

By attending and presenting research/creative works to a wider audience, students will:

1. Think critically about their learning experiences.
2. Demonstrate increased confidence in their ability to perform academically or artistically.
3. Express the importance of sharing research critical to our community, nation, and world, and give examples of ways that creative works contribute to society as well as personal growth.
4. Identify gains in core literacy skills (Ex: thinking critically, quantitative reasoning, public presentations or performances).

# **DAY ONE STUDENT CREATIVE WORKS**

*Tuesday May 14<sup>th</sup>, 2019*

[4:30 p.m. – 8:00 p.m.]

## **Fine Arts Complex**

4:30 p.m.	<b>Welcome &amp; Presenters Check-In Begins:</b>	<i>Art Building, Lobby &amp; Entrance</i>
4:30 – 7:30 p.m.	<b>Appetizers and Refreshments:</b>	<i>Art Building, Lobby</i>
4:30 – 8:00 p.m.	<b>Art and Design Exhibits:</b>	<i>Art Building, Gallery &amp; Lobby</i>
5:20 – 6:00 p.m.	<b>Music Composition Presentations:</b>	<i>Art Building Gallery</i>
5:30 – 6:00 p.m.	<b>Theatre Presentations:</b>	<i>University Theatre</i>
6:00 – 7:30 p.m.	<b>Creative Writing Presentations:</b>	<i>Art Building, Room 116</i>
6:00 – 8:00 p.m.	<b>Film Presentations:</b>	<i>R-TV Building, Room 123</i>

# **DAY TWO STUDENT RESEARCH**

*Wednesday May 15<sup>th</sup>, 2019*

[8:00 a.m. – 12:00 p.m.]

## **Senior & Hargreaves Hall**

8:00 a.m.	<b>Presenter Check-In Begins:</b>	<i>Senior Hall Entrance</i>
8:00 a.m. – 12:00 p.m.	<b>Information Tables:</b>	<i>Senior &amp; Hargreaves Hall</i>
8:30 a.m. – 12:00 a.m.	<b>Oral Presentations:</b>	<i>Senior Hall Classrooms</i>
8:50 a.m. – 9:10 a.m.	<b>Oral Presentations - Session 1</b>	<i>Senior Hall Classrooms</i>
9:10 a.m. – 9:30 a.m.	<b>Oral Presentations - Session 2</b>	<i>Senior Hall Classrooms</i>

9:30 a.m. – 9:50 a.m.	<b>Oral Presentations - Session 3</b>	<i>Senior Hall Classrooms</i>
9:50 a.m. – 10:10 a.m.	<b>Oral Presentations - Session 4</b>	<i>Senior Hall Classrooms</i>
10:10 a.m. – 10:30 a.m.	<b>Oral Presentations - Session 5</b>	<i>Senior Hall Classrooms</i>
10:40 a.m. – 11:00 a.m.	<b>Oral Presentations - Session 6</b>	<i>Senior Hall Classrooms</i>
11:00 a.m. – 11:20 a.m.	<b>Oral Presentations - Session 7</b>	<i>Senior Hall Classrooms</i>
11:20 a.m. – 11:40 a.m.	<b>Oral Presentations - Session 8</b>	<i>Senior Hall Classrooms</i>
11:40 a.m. – 12:00 p.m.	<b>Oral Presentations - Session 9</b>	<i>Senior Hall Classrooms</i>
8:30 a.m. – 10:00 a.m.	<b>Poster Presentations I:</b>	<i>Hargreaves Reading Room</i>
10:20 a.m. – 11:50 a.m.	<b>Poster Presentations II:</b>	<i>Hargreaves Reading Room</i>

### **Keynote Presentation**

*Pence Union Building's Nysether Community Room*

**12:15-1:45 p.m.**

Opening remarks from:     Dr. Lynn Briggs, *Dean, University College*  
   Dr. Mary Cullinan, *President*  
   Erik Puthoff, *STCU*

Introduction by Dr. Pete Porter, *CALE Co-Dean, Theatre & Film Chair*

**Keynote Address by Chase Ogden, *Assistant Professor in Film***



# **Aging Policy Fair**

**May 15<sup>th</sup> – Hargreaves Reading Room**

*8:30 – 12:00 p.m.*

## **TOPICS**

- Housing
- Ageism
- Discrimination
- Mental Health
- Aging-in-Place
- Trauma
- Rural Aging
- Access to Healthcare
- Dementia Spirituality/Religion
- Sexuality
- Aging Policy
- Health Disparities
- Health Coaching
- Lowering ER Visits
- Safe Neighborhoods
- Disabilities
- Age-Friendly Communities
- Fraud/Financial Abuse

## 2019 Inspiration Quote

# “Wisdom Begins in Wonder

– *Socrates*

The mission of the EWU Student Research and Creative Works Symposium is to promote student research, scholarship, and creative activity done in partnership with faculty as a vital component of higher education.

Given the current contentious political and social climate, it seems imperative that we all understand that we may have automatic and unconscious biases that influence our judgments. Such biases can influence our judgments of people, whether it be liberals/conservatives, members of stigmatized groups, or even ourselves.

This year, the Symposium Planning Committee chose the quote above in order to emphasize the tendency for all people to exhibit biases, and to highlight the fact that we can educate ourselves to recognize, and ideally reduce, our own biases. One must recognize one's flaws before they can be corrected. It is our mission this year to motivate people to take on this challenge.

## **Symposium Sponsors**

EWU University College, Spokane Teachers Credit Union.

### **Special Thanks**

**President** Dr. Mary Cullinan

**Provost and Vice President for Academic Affairs** Dr. Scott Gordon

**Keynote** Chase Ogden

**Department Chair/Co-Dean of CALE** Dr. Pete Porter

**University Graphics:** Judy McMillan and Larry Conboy

**Multi-Media Commons:** Carl Combs and Staff

**Records & Registration:** Debbie Fockler and Megan Austin

**Development:** Mike Westfall, Lenore Stark and Lisa Poplawski

**Information Technology:** Gary Pratt, Dana Simmelink and Daniel Messina

**Marketing & Communications:** Theresa Conway

**Visual Communication Design** Eric Galey and Travis Masingale

**Transportation Services:** Scott Buck and Team

**Dining Services:** Tom Shaffer and Mandy Rainey

**Printing Services and Eagle Sound**

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**Spokane Teachers Credit Union**

For their generous donation and continued support

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**To all the students, mentors, faculty & volunteers  
who have continually worked to make the Symposium a success.**

**If you would like to contribute to the Symposium Foundation,  
envelopes are available in 115A Showalter Hall.**

Please make checks payable to EWU Foundation for Student Research & Creative Works Symposium



## **Symposium Committee:**

*The mission of the EWU Student Research and Creative Works Symposium is to promote student research, scholarship, and creative activity done in partnership with faculty and staff as a vital component of higher education. Students, faculty, administrators, dignitaries and the community-at-large are invited to attend, hear and discuss undergraduate and graduate creative and scholarly work.*

### **2019 Symposium Committee Members**

1. Drew Ayers
2. Sharon Bowland
3. Kendal Cler
4. Brian Davenport
5. Cynthia Dukich
6. Greg duMonthier
7. David Early
8. Gail Forsgreen
9. Christina Torres Garcia
10. N.M. Awlad Hossain
11. Ginelle Hustrulid
12. Bryan James
13. Jonathan Johnson
14. Taylor Kensel
15. Chuck Lopez
16. Jonathan Middleton
17. Justin Otto
18. Thomas Shaffer
19. Julia Smith
20. Jeffrey Stafford
21. Anna Tresidder
22. Christina Valeo
23. Naomi Yavneh Klos



## EWU's Ronald E. McNair Post-Baccalaureate Achievement Program

*Fostering Excellence and Inspiring Awesome*



doctoral studies by providing opportunities for research or other scholarly activities including summer research internships, tutoring, academic counseling, seminars, and other educational activities designed to assist participants in securing admission to and financial assistance for doctoral enrollment. McNair research interns work closely with a faculty mentor to produce a scholarly research paper and present their findings at a conference.

This research expectation has created an ongoing partnership between McNair and EWU's Symposium, which was first organized in 1997 by EWU chemistry professor Dr. Jeanne Small. The 1997 Undergraduate Research and Creative Works Symposium consisted of 16 total oral presentations (9 were McNair scholars); 12 poster presentations (4 were McNair Scholars) and two musical performances. In 2001, McNair Director Dr. Karen McKinney (now retired) took over coordination with the support of Dr. Ron Dalla (now retired) and the help of a graduate assistant. Dr. McKinney coordinated the event through 2005 in Monroe Hall, by which time the Symposium had grown to 145 presenters. The Symposium was moved to Senior Hall in 2006, and since then the event has grown to become a marquee event on campus.

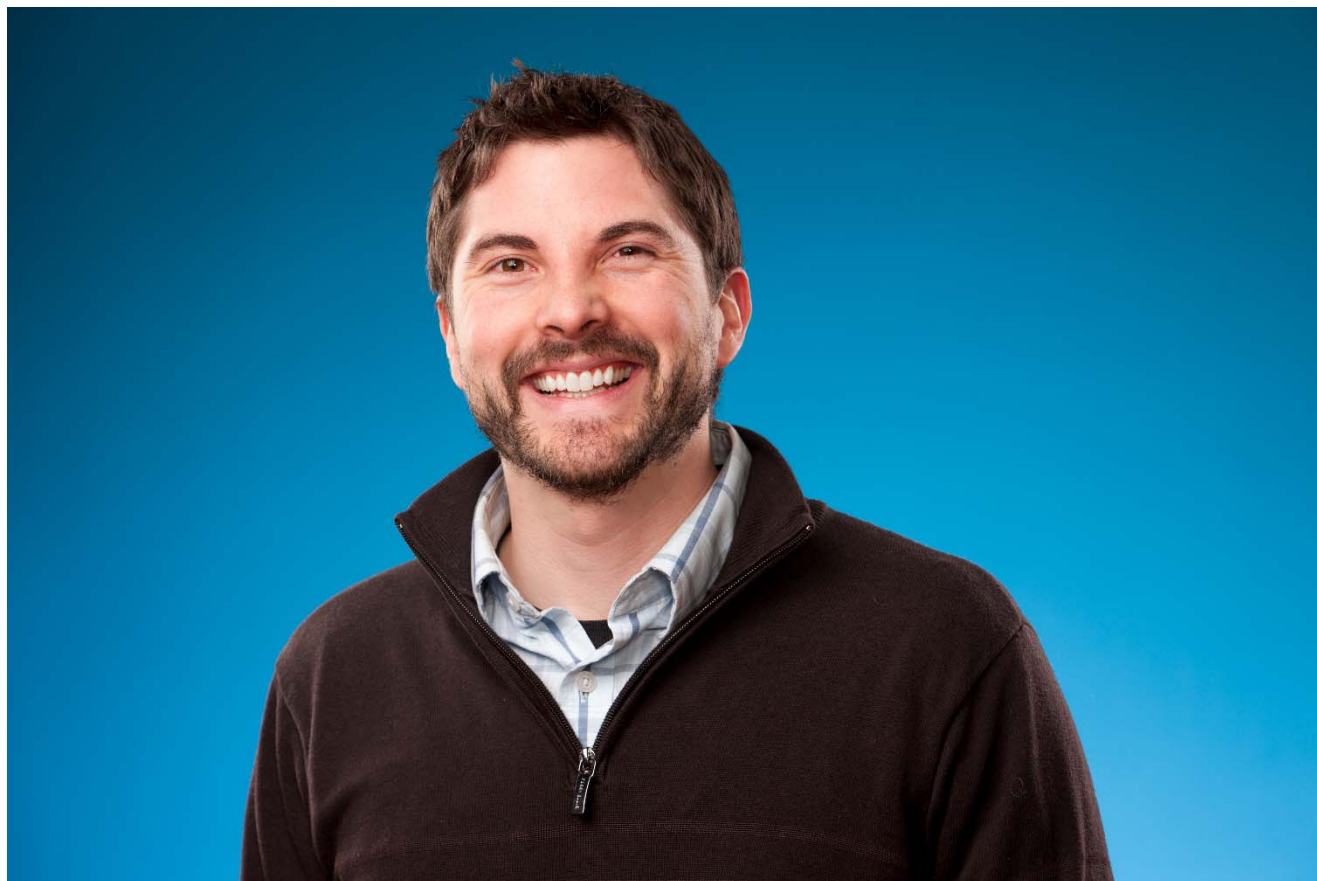
Since the first EWU McNair grant was funded in 1995, McNair has worked closely with Eastern faculty to build a research center community where students thrive. Our quest is to continue this partnership with EWU McNair Faculty Mentors, staff, and administrators and continue the transformation of our students.

Since 1995, twenty-seven EWU McNair Scholars have earned doctorates, 137 have earned master's degrees, and 59 are currently enrolled in graduate school. Of those 59 enrolled, 37 are in PhD programs.

**A**s one of eight federally-funded TRiO outreach and student services programs, the goal of the TRiO Ronald E. McNair Post-baccalaureate Achievement Program is to increase the attainment of PhD degrees by students from underrepresented segments of society. Eastern's McNair Program prepares eligible participants for successful

## **Keynote Speaker**

**12:15 – 1:45 p.m.**



**Chase Ogden, *Assistant Professor of Film***

### **Synopsis**

Films have the potential to amaze us with their spectacle, provide a glimpse of what it might be like to live in a different place or time, or hold a mirror up to our own reality. They have the power to move us emotionally, but they should also make us question intellectually. By uncovering the techniques filmmakers use to express their stories, we can engage with movies on a deeper level. Instead of letting them wash over us passively, we can start to identify the various ideas they present and consider how those ideas might fit into our own worldview.

### **Biography**

Chase Ogden is a multi-award winning filmmaker and Professor of Film at Eastern Washington University. Holding an MFA in film production from Chapman University, Ogden has been a part of 100s of different media projects over the years. Focusing primarily on postproduction and documentary, he has performed work for dozens of major clients such as Microsoft, Cisco, General Electric, the FDA, the National Park Service, and Mammoth Mountain. In 2006 he co-created a television show titled “Outdoor Storytellers” for the ABC affiliate station in Spokane, WA and continued to serve as the show’s co-producer, cinematographer, and editor until 2009. He is currently directing a feature length documentary about the first all African-American paratrooper unit in the US Army. Beyond teaching and making films he also serves as Director for the Spokane International Film Festival (SpIFF) and is currently a commissioner on the Spokane Arts Commission.

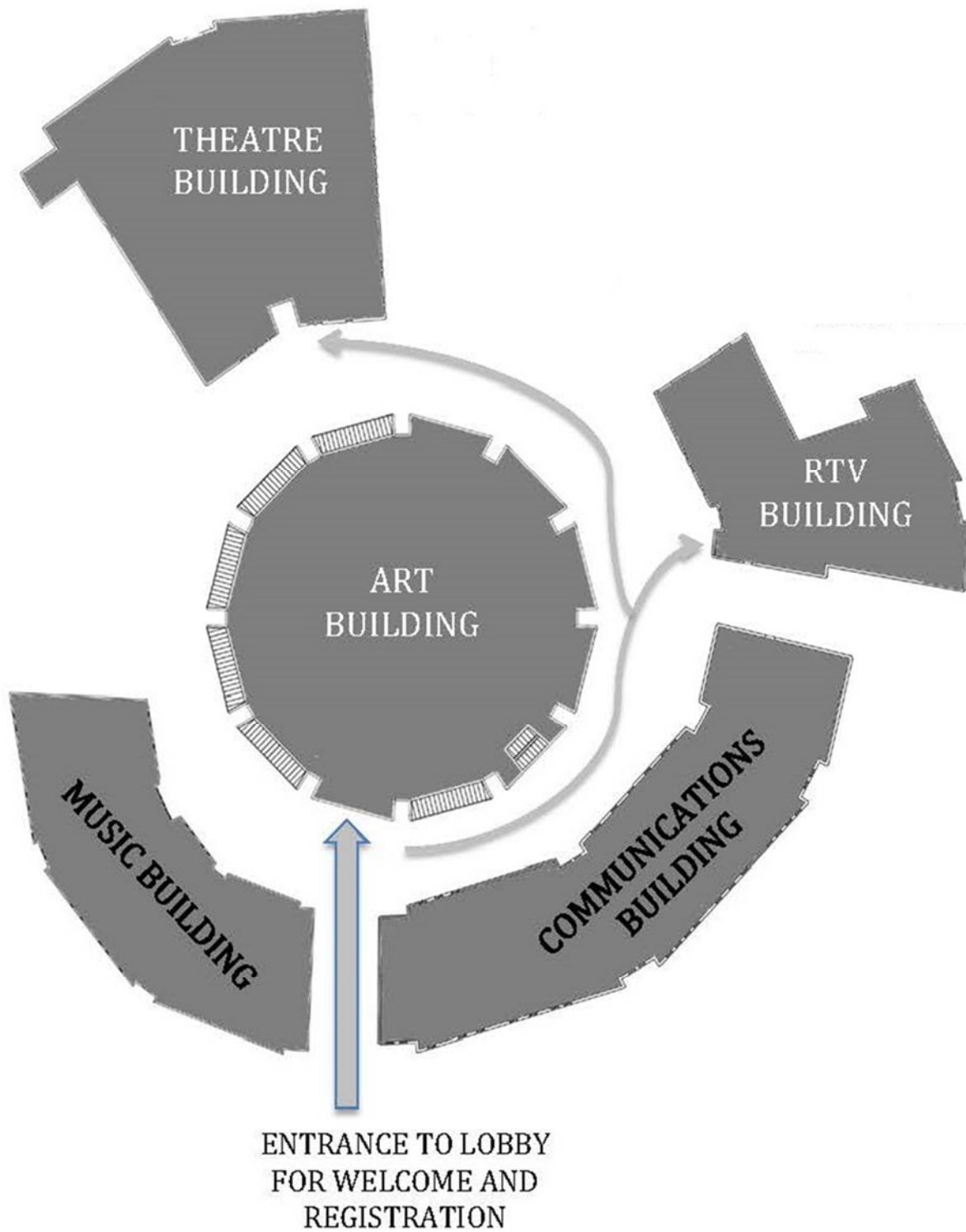
# STUDENT CREATIVE WORKS SCHEDULE

*Tuesday May 14<sup>th</sup>, 2019*

[4:30 p.m. – 8:00 p.m.]

- 4:30 p.m.**                    **Welcome & Presenters Check-In Begins:**  
*Art Building, Lobby & Entrance*
- 4:30 – 7:30 p.m.**           **Appetizers and Refreshments:**  
*Art Building, Lobby*
- 4:30 – 8:00 p.m.**           **Art and Design Exhibits:**  
*Art Building, Gallery & Lobby*
- 5:20 – 6:00 p.m.**           **Music Composition Presentations:**  
*Art Building Gallery*
- 5:30 – 6:00 p.m.**           **Theatre Presentations:**  
*University Theatre*
- 6:00 – 7:30 p.m.**           **Creative Writing Presentations:**  
*Art Building, Room 116*
- 6:00 – 8:00 p.m.**           **Film Presentations:**  
*R-TV Building, Room 123*

# Fine Arts Complex Map



## CREATIVE WORKS SESSIONS

4:30pm – 8:00pm

**Abuse: Location: Fine Arts Center - Art Gallery**

Location: Fine Arts Center - Art Gallery

*Speakers: Gisselle Garcia*

*Faculty Mentors: Joshua Hobson*

4:30pm – 8:00pm

**Blustery Night: Location: Fine Arts Center - Art Gallery**

Location: Fine Arts Center - Art Gallery

*Speakers: Annie Shiner*

*Faculty Mentors: Jenny Hyde*

4:30pm – 8:00pm

**Kids These Days: Location: Fine Arts Center - Art Gallery**

Location: Fine Arts Center - Art Gallery

*Speakers: Timothy Lacey III*

*Faculty Mentors: Greg duMonthier*

4:30pm – 8:00pm

**Losing touch: Location: Fine Arts Center - Art Gallery**

Location: Fine Arts Center - Art Gallery

*Speakers: Madeline McGinn*

*Faculty Mentors: Margot Casstevens*

4:30pm – 8:00pm

**Pressure: Location: Fine Arts Center - Art Gallery**

Location: Fine Arts Center - Art Gallery

*Speakers: Tyler Koven*

*Faculty Mentors: Jenny Hyde*

4:30pm – 8:00pm

**Prolonging the Inevitable: Location: Fine Arts Center - Art 113B**

Location: Fine Arts Center - Art 113B

*Speakers: Madison Jones*

*Faculty Mentors: Jenny Hyde*

4:30pm – 8:00pm

**Self Portrait: Location: Fine Arts Center - Art Gallery**

Location: Fine Arts Center - Art Gallery

*Speakers: Erika Symonenko*

*Faculty Mentors: Jenny Hyde*

4:30pm – 8:00pm

**Spot Healing: 1: Location: Fine Arts Center - Art Gallery**

Location: Fine Arts Center - Art Gallery

*Speakers: Sierra Dawson*

*Faculty Mentors: Josh Hobson, Jenny Hyde*

4:30pm – 8:00pm

**The Greater Litaglon: Location: Fine Arts Center - Art Gallery**

Location: Fine Arts Center - Art Gallery

*Speakers: Leslie Kolke*

*Faculty Mentors: Reinaldo Gil Zambrano*

4:30pm – 8:00pm

**Tutho: Location: Fine Arts Center - Art Gallery**

Location: Fine Arts Center - Art Gallery

*Speakers: Mario Mendez*

*Faculty Mentors: Jenny Hyde*

4:30pm – 8:00pm

**Webster's Insanity: Location: Fine Arts Center - Art Gallery**

Location: Fine Arts Center - Art Gallery

*Speakers: Brandt Wurzer*

*Faculty Mentors: Greg duMonthier*

5:20pm – 6:00pm

**A Star's Journey: Location: Fine Arts Center - Art Gallery**

Location: Fine Arts Center - Art Gallery

*Speakers: Samuel Jenkins*

*Faculty Mentors: Jonathan Middleton*



5:20pm – 6:00pm

**Call This What It Is: Location: Fine Arts Center - Art Gallery**

Location: Fine Arts Center - Art Gallery

*Speakers: Carl Christensen*

*Faculty Mentors: Jonathan Middleton*

5:20pm – 6:00pm

**Extension: Location: Fine Arts Center - Art Gallery**

Location: Fine Arts Center - Art Gallery

*Speakers: Diana Viskova*

*Faculty Mentors: Don Goodwin, Jonathan Middleton*

5:20pm – 6:00pm

**Sand and Dust/Groves: Location: Fine Arts Center - Art Gallery**

Location: Fine Arts Center - Art Gallery

*Speakers: Nathan Sumerlin*

*Faculty Mentors: Jonathan Middleton*

5:20pm – 6:00pm

**Through the woods: Location: Fine Arts Center - Art Gallery**

Location: Fine Arts Center - Art Gallery

*Speakers: Grace Nall*

*Faculty Mentors: Don Goodwin, Jonathan Middleton*

5:30pm – 6:00pm

**Musical Theatre Scholarship Audition: Location: Fine Arts Center - Theatre Stage**

Location: Fine Arts Center - Theatre Stage

*Speakers: MJ Daly*

*Faculty Mentors: Sara Goff, Jeff Sanders*

5:30pm – 6:00pm

**She Used To Be Mine: Location: Fine Arts Center - Theatre Stage**

Location: Fine Arts Center - Theatre Stage

*Speakers: Holly Kirkman*

*Faculty Mentors: Sara Goff*

5:30pm – 6:00pm

**The Sacrifice at Aulis: Location: Fine Arts Center - Theatre Stage**

Location: Fine Arts Center - Theatre Stage

*Speakers: Brittany Lael, Mica Pointer, Tristan Roseff, MJ Daly*

*Faculty Mentors: Sara Goff*

5:40pm – 6:00pm

**They did their best to keep me: Location: Fine Arts Center - Art Gallery**

Location: Fine Arts Center - Art Gallery

*Speakers: Tommie Tucker*

*Faculty Mentors: Margot Casstevens*

6:00pm – 6:20pm

**Aloha ‘āina - in color: Location: Fine Arts Center - Art Gallery**

Location: Fine Arts Center - Art Gallery

*Speakers: Jessie Coney*

*Faculty Mentors: Margot Casstevens*

6:00pm – 6:40pm

**Emotional Narrative: Location: Fine Arts Center - Art Gallery**

Location: Fine Arts Center - Art Gallery

*Speakers: Amanda Hartman*

*Faculty Mentors: Joshua Hobson*

6:30pm – 7:30pm

**Get Some Sleep : Location: Fine Arts Center - Film Room**

Location: Fine Arts Center - Film Room

*Speakers: Kira Westlund*

*Faculty Mentors: Chase Ogden*

6:30pm – 7:30pm

**Gut Punch: Location: Fine Arts Center - Film Room**

Location: Fine Arts Center - Film Room

*Speakers: Evan Hoff, Elan Toby*

*Faculty Mentors: Chase Ogden*

6:30pm – 7:30pm

**Life Unseen: Location: Fine Arts Center - Film Room**

Location: Fine Arts Center - Film Room

*Speakers: Jacob Lundin*

*Faculty Mentors: Chase Ogden*

6:30pm – 7:30pm

**The Disintegration Machine: Location: Fine Arts Center - Film Room**

Location: Fine Arts Center - Film Room

*Speakers: Michael Mihalasky, Andrew Macshmann*

*Faculty Mentors: Chase Ogden*

6:30pm – 7:30pm

**With War Comes Love: Location: Fine Arts Center - Film Room**

Location: Fine Arts Center - Film Room

*Speakers: Jorge Valencia, Ana Valdovinos*

*Faculty Mentors: Chase Ogden*

# STUDENT RESEARCH SESSIONS

*Wednesday May 15<sup>th</sup>, 2019*

[8:00 a.m. – 12:00 p.m.]

## **Senior & Hargreaves Hall**

8:50 a.m. – 9:10 a.m.	<b>Oral Presentations - Session 1</b>	<i>Senior Hall Classrooms</i>
9:10 a.m. – 9:30 a.m.	<b>Oral Presentations - Session 2</b>	<i>Senior Hall Classrooms</i>
9:30 a.m. – 9:50 a.m.	<b>Oral Presentations - Session 3</b>	<i>Senior Hall Classrooms</i>
9:50 a.m. – 10:10 a.m.	<b>Oral Presentations - Session 4</b>	<i>Senior Hall Classrooms</i>
10:10 a.m. – 10:30 a.m.	<b>Oral Presentations - Session 5</b>	<i>Senior Hall Classrooms</i>
10:40 a.m. – 11:00 a.m.	<b>Oral Presentations - Session 6</b>	<i>Senior Hall Classrooms</i>
11:00 a.m. – 11:20 a.m.	<b>Oral Presentations - Session 7</b>	<i>Senior Hall Classrooms</i>
11:20 a.m. – 11:40 a.m.	<b>Oral Presentations - Session 8</b>	<i>Senior Hall Classrooms</i>
11:40 a.m. – 12:00 p.m.	<b>Oral Presentations - Session 9</b>	<i>Senior Hall Classrooms</i>
8:30 a.m. – 10:00 a.m.	<b>Poster Presentations I:</b>	<i>Hargreaves Hall</i>
10:20 a.m. – 11:50 a.m.	<b>Poster Presentations II:</b>	<i>Hargreaves Hall</i>

# Oral Session 1

8:50 - 9:10 a.m.

8:50am – 9:10am

**Elimination of Surface alpha2-3 Sialic Acid Impairs Osteoclast Maturation:**  
**Location: Senior Hall - Room 203**

Location: Senior Hall - Room 203

*Speakers: Abigail Keever*  
*Faculty Mentors: Jason Ashley*

8:50am – 9:10am

**Klondike Fever: A Misdiagnosis: Location: Senior Hall - Room 306**

Location: Senior Hall - Room 306

*Speakers: Brian O'Riley*  
*Faculty Mentors: Ann Le Bar*

8:50am – 9:10am

**Looking at Diet and Possible Helminthic Parasite Interaction in Canis latrans:**  
**Location: Senior Hall - Room 204**

Location: Senior Hall - Room 204

*Speakers: Martina Davis*  
*Faculty Mentors: Krisztian Magori*

8:50am – 9:10am

**Military Injustice: Transferring Military Justice to the Federal Judicial System:  
Location: Senior Hall - Room 221**

Location: Senior Hall - Room 221

*Speakers: Ryan Soule*

*Faculty Mentors: Majid Sharifi*

8:50am – 9:10am

**Pain That We're Used To: A Sociological Analysis of Fight Culture in the National  
Hockey League: Location: Senior Hall - Room 302**

Location: Senior Hall - Room 302

*Speakers: Shelby Miksch*

*Faculty Mentors: Logan Greene*

8:50am – 9:10am

**Passive versus Active Rest: a Study on Performance: Location: Senior Hall - Room  
243**

Location: Senior Hall - Room 243

*Speakers: Ireland Hendrix, Martin Waldrip, Iris Fiaui*

*Faculty Mentors: John Gerber*

8:50am – 9:10am

**Public Radio and the Podcast: The Battle of Audio Journalism: Location: Senior Hall - Room 304**

Location: Senior Hall - Room 304

*Speakers: Jeremy Burnham*

*Faculty Mentors: Jamie Neely*

8:50am – 9:10am

**Tinder's Positive Influence on Relationship Satisfaction: Location: Senior Hall - Room 101**

Location: Senior Hall - Room 101

*Speakers: Halli Campbell*

*Faculty Mentors: Theresa Martin*

8:50am – 9:10am

**'Tis the Season: A Study on The Seasonal Variance of Altruistic Behaviors: Location: Senior Hall - Room 201**

Location: Senior Hall - Room 201

*Speakers: Greysen Danae*

*Faculty Mentors: Mark Holmgren*



# Oral Session 2

9:10 - 9:30 a.m.

9:10am – 9:30am

**Characterization of one-electron organoborohydride oxidation reactions via NMR:**  
**Location: Senior Hall - Room 304**

Location: Senior Hall - Room 304

*Speakers: Caleb Allen*  
*Faculty Mentors: Eric Abbey*

9:10am – 9:30am

**From the Closet to the Camps: The Persecution of Gays and Lesbians in 20th Century Germany: Location: Senior Hall - Room 306**

Location: Senior Hall - Room 306

*Speakers: Logan Schoesler*  
*Faculty Mentors: Ann Le Bar*

9:10am – 9:30am

**Identifying food insecure students at a large regional university: Location: Senior Hall - Room 204**

Location: Senior Hall - Room 204

*Speakers: Kianna Baker*  
*Faculty Mentors: Sarah Mount*

9:10am – 9:30am

**Impact of Conflict in Married v. Divorced Parents: Location: Senior Hall - Room 101**

Location: Senior Hall - Room 101

*Speakers: Dechen Edwards*

*Faculty Mentors: Theresa Martin*

9:10am – 9:30am

**Neighborhood Built Environment, Gentrification, and Subjective Experiences of Walkability: A Comparison of a Low and High Walk Score® Neighborhood: Location: Senior Hall - Room 201**

Location: Senior Hall - Room 201

*Speakers: Lisa Coyle*

*Faculty Mentors: Anna Tresidder*

9:10am – 9:30am

**Nutrient reduction to manage an invasive annual grass and impacts on the soil microbial community: Location: Senior Hall - Room 203**

Location: Senior Hall - Room 203

*Speakers: Jared Lamm*

*Faculty Mentors: Justin Bastow*

9:10am – 9:30am

**Perception of Female Defendants as a Function of Pregnancy Status: Location: Senior Hall - Room 302**

Location: Senior Hall - Room 302

*Speakers: Rachel Silverthorn*

*Faculty Mentors: Kayleen Islam-Zwart*

9:10am – 9:30am

**The American Dream and a Rousseauian Democracy: Location: Senior Hall - Room 221**

Location: Senior Hall - Room 221

*Speakers: Joseph Scott*

*Faculty Mentors: Majid Sharifi*

9:10am – 9:30am

**Therapeutic Recreation: Community Involvement: Location: Senior Hall - Room 243**

Location: Senior Hall - Room 243

*Speakers: Amy Holt*

*Faculty Mentors: Emily Messina*

# Oral Session 3

9:30 – 9:50 a.m.

9:30am – 9:50am

**English Literacy in a Colville-Okanagan Salish Immersion Classroom: Location: Senior Hall - Room 201**

Location: Senior Hall - Room 201

*Speakers: Elicia Allen*

*Faculty Mentors: Kassahun Kebede*

9:30am – 9:50am

**Evaluation of the real-time monitoring of electroporation applications using clinical potential of Electroacoustic Tomography (EAT): Location: Senior Hall - Room 204**

Location: Senior Hall - Room 204

*Speakers: Timothy LaPlante*

*Faculty Mentors: Ali Zarafshani*

9:30am – 9:50am

**Ghosting as a Dissolution Tactic in Romantic Relationships: Location: Senior Hall - Room 101**

Location: Senior Hall - Room 101

*Speakers: Lily Ann Long, Rachel Pinkerton, Theresa Lee*

*Faculty Mentors: Theresa Martin*

9:30am – 9:50am

**Hyperlocal Journalism & Business Models: Location: Senior Hall - Room 304**

Location: Senior Hall - Room 304

*Speakers: Samantha Jackson*

*Faculty Mentors: Jamie Neely*

9:30am – 9:50am

**Marguerite Higgins: Bringing War to the Masses: Location: Senior Hall - Room 306**

Location: Senior Hall - Room 306

*Speakers: Kelli Knerr*

*Faculty Mentors: Bill Youngs*

9:30am – 9:50am

**Physical activity, stress, and sedentary behavior in graduate students: The PASS study: Location: Senior Hall - Room 243**

Location: Senior Hall - Room 243

*Speakers: Emily Dunston*

*Faculty Mentors: Katie Taylor*

9:30am – 9:50am

**Riparian Resilience in the Face of Interacting Disturbances: Wildfire, erosion and beaver (*Castor canadensis*) in grazed riparian systems of the western United States:**  
**Location: Senior Hall - Room 203**

Location: Senior Hall - Room 203

*Speakers: Alexa Whipple*  
*Faculty Mentors: Rebecca Brown*

9:30am – 9:50am

**Social Exclusions: A Theoretical Link Between Neoliberal Rationality and School Shootings: Location: Senior Hall - Room 221**

Location: Senior Hall - Room 221

*Speakers: Bryan Lockwald*  
*Faculty Mentors: Thomas Hawley*

9:30am – 9:50am

**Stylistic Imitation as an English-Teaching Technique: Location: Senior Hall - Room 302**

Location: Senior Hall - Room 302

*Speakers: Min Yi Liang*  
*Faculty Mentors: LaVona Reeves*

# Oral Session 4

9:50 - 10:10 a.m.

9:50am – 10:10am

**Audience retention for news style podcasting: Location: Senior Hall - Room 304**

Location: Senior Hall - Room 304

*Speakers: Taylor Newquist*

*Faculty Mentors: Jamie Neely*

9:50am – 10:10am

**Borderlands Theory: Connections in Identity Development Between Latinx and Multiracial Communities: Location: Senior Hall - Room 201**

Location: Senior Hall - Room 201

*Speakers: Kim Jones*

*Faculty Mentors: Kassahun Kebede*

9:50am – 10:10am

**David and Goliath: The Abdication of a Throne: Location: Senior Hall - Room 306**

Location: Senior Hall - Room 306

*Speakers: Shawn Dufrene*

*Faculty Mentors: Ann Le Bar*

9:50am – 10:10am

**Eating Relationships: Victorian appetites in Trilby and Dracula: Location: Senior Hall - Room 302**

Location: Senior Hall - Room 302

*Speakers: Rose Hall*

*Faculty Mentors: Beth Torgerson*

9:50am – 10:10am

**Friends With Benefits Relationships Versus Intimate Relationships and their Relationship Satisfaction: Location: Senior Hall - Room 101**

Location: Senior Hall - Room 101

*Speakers: Nicole Schmidt*

*Faculty Mentors: Theresa Martin*

9:50am – 10:10am

**Populism: An Exploration of Ideological Polarization and the Motivational Nature of Resentment: Location: Senior Hall - Room 221**

Location: Senior Hall - Room 221

*Speakers: Justin Harmon*

*Faculty Mentors: Majid Sharifi*



9:50am – 10:10am

**Riparian Resilience in the Face of Interacting Disturbances: Wildfire, erosion and beaver (*Castor canadensis*) in grazed riparian systems of the western United States: Location: Senior Hall - Room 203**

Location: Senior Hall - Room 203

*Speakers: Alexa Whipple*

*Faculty Mentors: Rebecca Brown, Margaret O'Connell*

9:50am – 10:10am

**The Effect of Blood Flow Restriction on Muscle Hypertrophy and Strength: An Experimental Study: Location: Senior Hall - Room 243**

Location: Senior Hall - Room 243

*Speakers: Kristin Freitas, Harli Spurgeon, Shawn Semb*

*Faculty Mentors: John Gerber*

9:50am – 10:10am

**White Nose Syndrome infection and Microbiome Diversity of *Myotis lucifugus* with Ectoparasites in Eastern Washington: Location: Senior Hall - Room 204**

Location: Senior Hall - Room 204

*Speakers: Jamie Olson, Aaron Hope, Connor Abney*

*Faculty Mentors: Krisztian Magori*

# Oral Session 5

10:10 - 10:30 a.m.

10:10am – 10:30am

**Living Life the Wiccan Way: An ethnographic narrative: Location: Senior Hall - Room 201**

Location: Senior Hall - Room 201

*Speakers: Terrie Cramer*

*Faculty Mentors: Kassahun Kebede*

10:10am – 10:30am

**Revising Health Misconceptions: Location: Senior Hall - Room 101**

Location: Senior Hall - Room 101

*Speakers: James Rheams*

*Faculty Mentors: Danielle Sitzman*

10:10am – 10:30am

**Spinoza: The Modern Stoic: Location: Senior Hall - Room 306**

Location: Senior Hall - Room 306

*Speakers: April Wright*

*Faculty Mentors: Kevin Decker*

10:10am – 10:30am

**The Affect of Concussions on Mental Health in Division I Collegiate Athletes:**

**Location: Senior Hall - Room 243**

Location: Senior Hall - Room 243

*Speakers: Isabella Quaratiello, Mckenna Patrick, Eli Strom*

*Faculty Mentors: John Gerber*

10:10am – 10:30am

**Using Social Media Effectively: Location: Senior Hall - Room 304**

Location: Senior Hall - Room 304

*Speakers: Lauren Dierkop*

*Faculty Mentors: Jamie Neely*

10:10am – 10:30am

**Who Inspired Whom: Jack the Ripper and Robert Louis Stevenson: Location: Senior Hall - Room 302**

Location: Senior Hall - Room 302

*Speakers: Ashley Hansen*

*Faculty Mentors: Beth Torgerson*

10:20am – 10:40am

**Detection of Rickettsia spp. in ticks at Turnbull National Wildlife Refuge, WA:**  
**Location: Senior Hall - Room 203**

Location: Senior Hall - Room 203

*Speakers: Justin Donahue*

*Faculty Mentors: Krisztian Magori, Margaret O'Connell*

# Oral Session 6

10:40 - 11:00 a.m.

10:40am – 11:00am

**Benefits of open source as a new journalism model: Location: Senior Hall - Room 304**

Location: Senior Hall - Room 304

*Speakers: Erik Rotness*

*Faculty Mentors: Jamie Neely*

10:40am – 11:00am

**Composite Materials Analysis: Location: Senior Hall - Room 306**

Location: Senior Hall - Room 306

*Speakers: Heidi Plough, Joe Wagoner*

*Faculty Mentors: Awlad Hossain*

10:40am – 11:00am

**How Do Fine Sediments and Hangman Creek Discharge Affect Benthic Macroinvertebrates in the Spokane River?: Location: Senior Hall - Room 203**

Location: Senior Hall - Room 203

*Speakers: Anwar Bushnaq*

*Faculty Mentors: Camille McNeely*

10:40am – 11:00am

**Lactobacillus acidophilus as a Probiotic for use against Inflammatory Bowel Disease:**  
**Location: Senior Hall - Room 204**

Location: Senior Hall - Room 204

*Speakers: Lindsey Gieser, Hailey Gieser, Chandler Hodge, Hayden Jones, Christina Hill, Ryan Cao*

*Faculty Mentors: Krisztian Magori*

10:40am – 11:00am

**Modernization of the USSR within the scope of hydro-power and anti-western ideas:**  
**Location: Senior Hall - Room 221**

Location: Senior Hall - Room 221

*Speakers: Wendolyn Martinez*

*Faculty Mentors: Dorothy Zeisler-Vralsted*

10:40am – 11:00am

**Using Music to Enhance Story in Video Games: Location: Senior Hall - Room 302**

Location: Senior Hall - Room 302

*Speakers: Nathan Sumerlin*

*Faculty Mentors: Jonathan Middleton*

10:40am – 11:00am

**Why LinkedIn is an effective means for your job search: Location: Senior Hall - Room 201**

Location: Senior Hall - Room 201

*Speakers: Stephanie Fleisher*

*Faculty Mentors: Galina Sinekopova*

10:40am – 11:00am

**“Barriers, awareness, and beliefs for reducing single-use plastic consumption among college students.”: Location: Senior Hall - Room 243**

Location: Senior Hall - Room 243

*Speakers: McKayla Elliott, Sarah Olson*

*Faculty Mentors: Sarah Mount*

# Oral Session 7

11:00 - 11:20 a.m.

11:00am – 11:20am

**A Preliminary Study of Farmworker Health in the Yakima Valley: Location: Senior Hall - Room 101**

Location: Senior Hall - Room 101

*Speakers: Maria Rivera Diaz*

*Faculty Mentors: Martin Meraz-Garcia*

11:00am – 11:20am

**Influence of soil moisture on the establishment phase for the perennial forb Arrowleaf balsamroot (*Balsamorhiza sagittata*): Location: Senior Hall - Room 203**

Location: Senior Hall - Room 203

*Speakers: Sarah Hill*

*Faculty Mentors: Robin O'Quinn*

11:00am – 11:20am

**Novel Borohydrides: Location: Senior Hall - Room 304**

Location: Senior Hall - Room 304

*Speakers: James Yates*

*Faculty Mentors: Eric Abbey*



11:00am – 11:20am

**Sensitivity Analysis of a Peizoresistive Pressure Sensor for Different Aspect Ratios:**  
**Location: Senior Hall - Room 306**

Location: Senior Hall - Room 306

*Speakers: Joe Wagoner*

*Faculty Mentors: Heechang Bae, Awlad Hossain*

11:00am – 11:20am

**Storytelling on Instagram: Experiences as a social media influencer.: Location:**  
**Senior Hall - Room 201**

Location: Senior Hall - Room 201

*Speakers: Thomas Ghezzi*

*Faculty Mentors: Galina Sinekopova*

11:00am – 11:20am

**The Phenomenology of it all: Location: Senior Hall - Room 302**

Location: Senior Hall - Room 302

*Speakers: Justin Campbell*

*Faculty Mentors: Ian Green*

11:00am – 11:20am

**Variables affecting the prevalence of Cat Scratch Fever in Eastern Washington:**  
**Location: Senior Hall - Room 204**

Location: Senior Hall - Room 204

*Speakers: Aleesha Grove, Tina Cao, Samantha Cheever, Halli McGraw, Jenny Peterson, Kevin Scott, Laura Tarango*  
*Faculty Mentors: Krisztian Magori*

11:00am – 11:20pm

**Abstract: Darfur Genocide: History of Conflict and Marginalization in Sudan and the Dereliction of the International Response: Location: Senior Hall - Room 221**

Location: Senior Hall - Room 221

*Speakers: Abdulrazik Mohammed*  
*Faculty Mentors: Dorothy Zeisler-Vralsted*

# Oral Session 8

11:20 - 11:40 a.m.

11:20am – 11:40am

**Biosorption of copper ions in aqueous solutions using microorganisms: Location: Senior Hall - Room 304**

Location: Senior Hall - Room 304

*Speakers: Martina Davis*

*Faculty Mentors: Tony Masiello, Carmen Nezat*

11:20am – 11:40am

**Colonization of Mosquito from Turnbull National Wildlife Refuge**

Location: Senior Hall - Room 204

*Speakers: Erika Magana*

*Faculty Mentors: Krisztian Magori*

11:20am – 11:40am

**Diet Composition of Lake Trout (*Salvelinus namaycush*) in Upper Priest Lake, Idaho: Location: Senior Hall - Room 203**

Location: Senior Hall - Room 203

*Speakers: Coty Jasper*

*Faculty Mentors: Paul Spruell*

11:20am – 11:40am

**Finite Element Stress Analysis of 3D Printed Material: Location: Senior Hall - Room 306**

Location: Senior Hall - Room 306

*Speakers: Nathan Navarra*

*Faculty Mentors: Alex Bae, Matthew Michaelis*

11:20am – 11:40am

**KNOWLEDGE OF HEART DISEASE AND INDICES OF PHYSICAL ACTIVITY IN HEALTH AND NON-HEALTH BASED MAJORS: Location: Senior Hall - Room 243**

Location: Senior Hall - Room 243

*Speakers: Kailyn Sanchez*

*Faculty Mentors: Christi Brewer*

11:20am – 11:40am

**Public Interest Litigation & Women's Rights in South Asia: Cases from Nepal & India: Location: Senior Hall - Room 221**

Location: Senior Hall - Room 221

*Speakers: Jordan Stevenson*

*Faculty Mentors: Vandana Asthana*

11:20am – 11:40am

**Recordando a los Mayas - Participation of Indigenous Mayan Women in Guatemala:  
Location: Senior Hall - Room 101**

Location: Senior Hall - Room 101

*Speakers: Josiah Van Egdon*

*Faculty Mentors: Martin Meraz-Garcia*

11:20am – 11:40am

**U.S. Intervention in Syria: Location: Senior Hall - Room 302**

Location: Senior Hall - Room 302

*Speakers: Christopher Poe*

*Faculty Mentors: Thomas Hawley, Taylor Kensel*

11:20am – 11:40pm

**This Topic is Awkward: Location: Senior Hall - Room 201**

Location: Senior Hall - Room 201

*Speakers: Hayley VonHolten-McAvoy*

*Faculty Mentors: Galina Sinekopova*

# Oral Session 9

11:40 a.m. - 12:00 p.m.

11:40am – 12:00pm

**China-Nigeria Relationship Lost Opportunity to Nigeria: Location: Senior Hall - Room 221**

Location: Senior Hall - Room 221

*Speakers: Kristina Hughes*

*Faculty Mentors: Kristin Edquist*

11:40am – 12:00pm

**Effects of Pesticides on the Growth of Honey Bee Gut Microbes: Location: Senior Hall - Room 203**

Location: Senior Hall - Room 203

*Speakers: Macee Mitchell*

*Faculty Mentors: Jenifer Walke*

11:40am – 12:00pm

**Fun and Finney Games for the Intermediate Piano Student: Location: Senior Hall - Room 302**

Location: Senior Hall - Room 302

*Speakers: Davis Hill*

*Faculty Mentors: Jane Ellsworth, Jody Graves*

11:40am – 12:00pm

**Hispanic and Latinx Students' Journey to Becoming A Nurse: Location: Senior Hall - Room 243**

Location: Senior Hall - Room 243

*Speakers: Kat Morigi*

*Faculty Mentors: Martin Meraz-Garcia*

11:40am – 12:00pm

**Testing the effectiveness of household liquids as tick repellents.: Location: Senior Hall - Room 204**

Location: Senior Hall - Room 204

*Speakers: Nicholas Vanderholm, Hunter Lee, Jacob Ott*

*Faculty Mentors: Krisztian Magori*

11:40am – 12:00pm

**¿Si Se Puede? An In-Depth Examination of Latinx Students Experiences from Rural Washington in Higher Education: Location: Senior Hall - Room 101**

Location: Senior Hall - Room 101

*Speakers: Ereisa Morales*

*Faculty Mentors: Edmundo Aguilar*

# Poster Session I

8:30 a.m. - 10:00 a.m.

8:30am – 10:00am

**Adaptive Paddling Capstone Project: Location: Hargreaves Hall, Reading Room - 14B**

Location: Hargreaves Hall, Reading Room - 14B

*Speakers: Cameron Metcalfe, Guthrie Boleneus, Jacob Stewart, Cameron Vaughn, Noah Barney, Reed Siclair*

*Faculty Mentors: Robert Gerlick, Philip Kramer*

8:30am – 10:00am

**Advancing Technologies and Retreating Glaciers: a review of research methods for studying glaciers: Location: Hargreaves Hall, Reading Room - 15B**

Location: Hargreaves Hall, Reading Room - 15B

*Speakers: Mary Lewan*

*Faculty Mentors: Erin Dascher*

8:30am – 10:00am

**Archaeology and Climate Change: Sites at Risk in the Puget Sound Watershed: Location: Hargreaves Hall, Reading Room - 1A**

Location: Hargreaves Hall, Reading Room - 1A

*Speakers: Christy Berg*

*Faculty Mentors: Erin Dascher*



8:30am – 10:00am

**Assaying the biostimulant activity of two commercially available soil treatments:  
Location: Hargreaves Hall, Reading Room - 7A**

Location: Hargreaves Hall, Reading Room - 7A

*Speakers: Sherry Napier*

*Faculty Mentors: Luis Matos*

8:30am – 10:00am

**Beaver, Bats, and Burned Riparia The effects of beaver modified riparia on bat  
activity within burned and non-burned watersheds in the Methow Valley, WA:  
Location: Hargreaves Hall, Reading Room - 9A**

Location: Hargreaves Hall, Reading Room - 9A

*Speakers: Cole Sherwood*

*Faculty Mentors: Margaret O'Connell*

8:30am – 10:00am

**Bone Marrow Macrophage Cell Density Plays a Regulatory Role in Osteoclast  
Differentiation: Location: Hargreaves Hall, Reading Room - 1C**

Location: Hargreaves Hall, Reading Room - 1C

*Speakers: Amber Framstad*

*Faculty Mentors: Jason Ashley*

8:30am – 10:00am

**Bull Trout (*Salvelinus confluentus*) can detect conspecific pheromones in a two choice Y-maze: Location: Hargreaves Hall, Reading Room - 9B**

Location: Hargreaves Hall, Reading Room - 9B

*Speakers: Hannah Coles*

*Faculty Mentors: Allan Scholz, Paul Spruell*

8:30am – 10:00am

**California Bearing Ratio Testing of Interdisciplinary Science Center Soil: Location: Hargreaves Hall, Reading Room - 18**

Location: Hargreaves Hall, Reading Room - 18

*Speakers: Paul Cameron*

*Faculty Mentors: Richard Orndorff*

8:30am – 10:00am

**Characterizing the role of sRNA-cagPAI-I in *Helicobacter pylori* gene regulation: Location: Hargreaves Hall, Reading Room - 3C**

Location: Hargreaves Hall, Reading Room - 3C

*Speakers: Veronica Albrecht*

*Faculty Mentors: Andrea Castillo*

8:30am – 10:00am

**Compactive Effort and Unconfined Compressive Strength of Mt. Mazama Ash and Latah Creek Floodplain Soil in Eastern Washington: Location: Hargreaves Hall, Reading Room - 16**

Location: Hargreaves Hall, Reading Room - 16

*Speakers: Aaron Cleveland*

*Faculty Mentors: Richard Orndorff*

8:30am – 10:00am

**Competition Driven Semelparity of Brook Stickleback (*Culaea inconstans*) in Turnbull National Wildlife Refuge.: Location: Hargreaves Hall, Reading Room - 9C**

Location: Hargreaves Hall, Reading Room - 9C

*Speakers: Sasha Goheen*

*Faculty Mentors: Paul Spruell*

8:30am – 10:00am

**CONTACT METAMORPHISM, MINERALIZATION, AND DETRIAL ZIRCON INTERPRETATION FROM SILVER HILL SPOKANE WASHINGTON: Location: Hargreaves Hall, Reading Room - 22**

Location: Hargreaves Hall, Reading Room - 22

*Speakers: Jaremy Shaw*

*Faculty Mentors: Chad Pritchard*

8:30am – 10:00am

**DETAILED SEDIMENTOLOGICAL ANALYSIS OF THE LATAH FORMATION FROM CORE 5, CHENEY, WA: Location: Hargreaves Hall, Reading Room - 15C**

Location: Hargreaves Hall, Reading Room - 15C

*Speakers: Jayce Lazuhrcatt*

*Faculty Mentors: Lindsay MacKenzie*

8:30am – 10:00am

**Development of a constitutively expressing serratiopeptidase secretion system in Lactococcus lactis: Location: Hargreaves Hall, Reading Room - 8A**

Location: Hargreaves Hall, Reading Room - 8A

*Speakers: Taylor Mauzy*

*Faculty Mentors: Luis Matos*

8:30am – 10:00am

**Discovery of Antibiotic-Producing Bacteria from Local Soil Samples: Location: Hargreaves Hall, Reading Room - 11A**

Location: Hargreaves Hall, Reading Room - 11A

*Speakers: Xiaolei Mao, Michael Shane Martin*

*Faculty Mentors: Suzanne Bassett*

8:30am – 10:00am

**Distribution of zinc toxicity levels in surface waters across Washington State:  
Location: Hargreaves Hall, Reading Room - 17**

Location: Hargreaves Hall, Reading Room - 17

*Speakers: Taylor Hogue  
Faculty Mentors: Carmen Nezat*

8:30am – 10:00am

**Effect of metal-doping on the structural and magnetic properties of  
Cu(NO<sub>3</sub>)<sub>2</sub>(pyrazine) and Cu(pyrimidine)(NO<sub>3</sub>)<sub>2</sub>(H<sub>2</sub>O)<sub>2</sub>: Location: Hargreaves Hall,  
Reading Room - 12B**

Location: Hargreaves Hall, Reading Room - 12B

*Speakers: Sydney Kaech  
Faculty Mentors: Jamie Manson*

8:30am – 10:00am

**Effect of Nutrition on Honey Bee Gut Microbiome, Disease Occurrence, and Hive  
Growth: Location: Hargreaves Hall, Reading Room - 10A**

Location: Hargreaves Hall, Reading Room - 10A

*Speakers: Shelby Fettig  
Faculty Mentors: Jenifer Walke*

8:30am – 10:00am

**Effect of Sleep on Cognitive Outcomes in Patients with Stroke or Brain Injury in an Inpatient Rehabilitation Setting: Location: Hargreaves Hall, Reading Room - 27**

Location: Hargreaves Hall, Reading Room - 27

*Speakers: Sarah Neveux*

*Faculty Mentors: Elena Crooks*

8:30am – 10:00am

**Effects of intranasal oxytocin pre- and post-treatment in a rat model of PTSD: Location: Hargreaves Hall, Reading Room - 4C**

Location: Hargreaves Hall, Reading Room - 4C

*Speakers: Samantha Hilfiker, Rachel Westerman, Tedra Moorhead, Shayla Storaci, Cesar Guzman*

*Faculty Mentors: David Daberkow*

8:30am – 10:00am

**Effects of restoration techniques on wetland plant communities and prevalence of invasive grass species in and around Turnbull National Wildlife Refuge: Location: Hargreaves Hall, Reading Room - 5B**

Location: Hargreaves Hall, Reading Room - 5B

*Speakers: Jade Clinkenbeard*

*Faculty Mentors: Joanna Joyner-Matos*

8:30am – 10:00am

**Effects of structural order on magnetic properties of  $S = 1$   $[\text{Ni}(\text{HF}_2)(\text{pyz})_2]\text{PF}_6$ :  
Location: Hargreaves Hall, Reading Room - 12C**

Location: Hargreaves Hall, Reading Room - 12C

*Speakers: Ashley Glover*

*Faculty Mentors: Jamie Manson*

8:30am – 10:00am

**Effects of Warming on Wetland Microbial Communities at Turnbull National  
Wildlife Refuge: Location: Hargreaves Hall, Reading Room - 2B**

Location: Hargreaves Hall, Reading Room - 2B

*Speakers: Marissa Medina*

*Faculty Mentors: Justin Bastow*

8:30am – 10:00am

**Environmental and Anthropogenic Factors Affecting Coral Health: Location:  
Hargreaves Hall, Reading Room - 6C**

Location: Hargreaves Hall, Reading Room - 6C

*Speakers: Kristin Jones*

*Faculty Mentors: Krisztian Magori*

8:30am – 10:00am

**Establishing a quantifiable phenotype associated with Succinic Semialdehyde Dehydrogenase Deficiency in Drosophila melanogaster: Location: Hargreaves Hall, Reading Room - 7B**

Location: Hargreaves Hall, Reading Room - 7B

*Speakers: Seth Buller, Peyton Owen*

*Faculty Mentors: Luis Matos*

8:30am – 10:00am

**Examining the impact of e-cigarette “e-juice” components on development using the Drosophila model: Location: Hargreaves Hall, Reading Room - 7C**

Location: Hargreaves Hall, Reading Room - 7C

*Speakers: Jose Osuna, Kyanna Cusick*

*Faculty Mentors: Luis Matos*

8:30am – 10:00am

**Experiments to Synthesize Bizarre Soft-Sedimentary Features and Clastic Dikes: Location: Hargreaves Hall, Reading Room - 24**

Location: Hargreaves Hall, Reading Room - 24

*Speakers: Chelsi Howard*

*Faculty Mentors: Chad Pritchard*



8:30am – 10:00am

**Genetic Identification of Signature Microbial Species in the MS model: Location: Hargreaves Hall, Reading Room - 8B**

Location: Hargreaves Hall, Reading Room - 8B

*Speakers: Tristan Bennett, Isaac Munroe, Shaw Hesse, Athena Miller*

*Faculty Mentors: Javier Ochoa-Repáraz*

8:30am – 10:00am

**Housing Discrimination in the Tri-Cities Latines Community: Location: Hargreaves Hall, Reading Room - 13B**

Location: Hargreaves Hall, Reading Room - 13B

*Speakers: Angelica Garcia-Macias*

*Faculty Mentors: Martin Meraz-Garcia*

8:30am – 10:00am

**Hydrogeologic Properties of CRB Continuous Core: Location: Hargreaves Hall, Reading Room - 25**

Location: Hargreaves Hall, Reading Room - 25

*Speakers: Greysen Bjork*

*Faculty Mentors: Chad Pritchard*

8:30am – 10:00am

**IAM3D Hovercraft: Location: Hargreaves Hall, Reading Room - 14A**

Location: Hargreaves Hall, Reading Room - 14A

*Speakers: Cameron Metcalfe, Joseph Lenoue, Jack Kelly, Ben Zuniga, Qasim Alqasim*  
*Faculty Mentors: Jason Durfee*

8:30am – 10:00am

**Impact of Chytrid Fungus Pathogen on Skin Microbiome of Columbia Spotted Frogs in Northern Idaho: Location: Hargreaves Hall, Reading Room - 10B**

Location: Hargreaves Hall, Reading Room - 10B

*Speakers: Philip Campos*  
*Faculty Mentors: Jenifer Walke*

8:30am – 10:00am

**Impact of prophylactic intranasal oxytocin on signs of fear in a mouse model of PTSD: Location: Hargreaves Hall, Reading Room - 4B**

Location: Hargreaves Hall, Reading Room - 4B

*Speakers: Mitchell Gainer, Kassandra Whitworth, Miranda Champion, Cameron Alvis, Emily Koehler, Maddison Mcneill*  
*Faculty Mentors: David Daberkow*

8:30am – 10:00am

**Intranasal oxytocin increases dopamine signaling in the dorsal striatum of anesthetized rats: Location: Hargreaves Hall, Reading Room - 4A**

Location: Hargreaves Hall, Reading Room - 4A

*Speakers: Darren Ginder, Christina Ramelow, Mitchell Gainer*

*Faculty Mentors: David Daberkow*

8:30am – 10:00am

**Investigating Metallothionein Production and Gene Copy Number as Factors for Increased Heavy Metal Resistance in an Idaho Strain of *Hyalella azteca*: Location: Hargreaves Hall, Reading Room - 5C**

Location: Hargreaves Hall, Reading Room - 5C

*Speakers: Aleesha Grove*

*Faculty Mentors: Joanna Joyner-Matos*

8:30am – 10:00am

**Landslide/Building assessment using drone mounted thermal imaging: Location: Hargreaves Hall, Reading Room - 23**

Location: Hargreaves Hall, Reading Room - 23

*Speakers: Ethan Ducken*

*Faculty Mentors: Chad Pritchard*

8:30am – 10:00am

**Low Vapor Pressure: Location: Hargreaves Hall, Reading Room - 13A**

Location: Hargreaves Hall, Reading Room - 13A

*Speakers: Michael Mohn*

*Faculty Mentors: Anthony Masiello*

8:30am – 10:00am

**Low-dimensional quantum magnets composed of transition metal sacchrinate complexes: Location: Hargreaves Hall, Reading Room - 12A**

Location: Hargreaves Hall, Reading Room - 12A

*Speakers: Nicole Etten*

*Faculty Mentors: Jamie Manson*

8:30am – 10:00am

**Masking Murder for Profit: the Case of Unilever's Mercury Pollution in Kodaikanal, Indi: Location: Hargreaves Hall, Reading Room - 15A**

Location: Hargreaves Hall, Reading Room - 15A

*Speakers: Rachel Graham*

*Faculty Mentors: Matthew Anderson*

8:30am – 10:00am

**Mathematical Model of Changes in Inosine Concentrations in the Purine Nucleotide Metabolic Pathway: Location: Hargreaves Hall, Reading Room - 26**

Location: Hargreaves Hall, Reading Room - 26

*Speakers: Nathan Blair*

*Faculty Mentors: Nicholas Burgis, Frank Lynch*

8:30am – 10:00am

**Modification of Osteoclast Precursor Notch Receptors with CRISPR/Cas9: Location: Hargreaves Hall, Reading Room - 2A**

Location: Hargreaves Hall, Reading Room - 2A

*Speakers: Samuel Hatfield*

*Faculty Mentors: Jason Ashley*

8:30am – 10:00am

**Morphometric changes of body shape in different extant horse breeds through human selection: Location: Hargreaves Hall, Reading Room - 3A**

Location: Hargreaves Hall, Reading Room - 3A

*Speakers: Emily Spencer, Sarah Kangere*

*Faculty Mentors: Judd Case*

8:30am – 10:00am

**Natural compound farnesol reduces T cell infiltration of the CNS in mouse model of Multiple sclerosis: Location: Hargreaves Hall, Reading Room - 8C**

Location: Hargreaves Hall, Reading Room - 8C

*Speakers: Lacey Sell*

*Faculty Mentors: Javier Ochoa-Repáraz*

8:30am – 10:00am

**Nucleophilic Aromatic Substitution of Benzodiazaborole: Location: Hargreaves Hall, Reading Room - 11C**

Location: Hargreaves Hall, Reading Room - 11C

*Speakers: Abbigail Cox*

*Faculty Mentors: Ashley Lamm*

8:30am – 10:00am

**Optimum Moisture Content and Maximum Dry Unit Weight for Compaction of Interdisciplinary Science Center Soil: Location: Hargreaves Hall, Reading Room - 20**

Location: Hargreaves Hall, Reading Room - 20

*Speakers: Rachel Lunstroth, Maria O'Toole, Melissa Simbler*

*Faculty Mentors: Richard Orndorff*

8:30am – 10:00am

**Pesticide Residues in Honey Bees and their Effects on the Gut Microbiome: Location: Hargreaves Hall, Reading Room - 10C**

Location: Hargreaves Hall, Reading Room - 10C

*Speakers: Daniel Franzese*

*Faculty Mentors: Jenifer Walke*

8:30am – 10:00am

**Preliminary Characterization of Lysine 89 ITPase Mutant: Location: Hargreaves Hall, Reading Room - 11B**

Location: Hargreaves Hall, Reading Room - 11B

*Speakers: Dean Ownbey*

*Faculty Mentors: Nicholas Burgis*

8:30am – 10:00am

**Quantitative characterization and size scaling of bone histological features between human and non-human mammalian bone.: Location: Hargreaves Hall, Reading Room - 3B**

Location: Hargreaves Hall, Reading Room - 3B

*Speakers: Jaqulynn Haines*

*Faculty Mentors: Judd Case*

8:30am – 10:00am

**Relaxed Mental State Detection using the Emotive Epc and Adaptive Threshold Algorithms: Location: Hargreaves Hall, Reading Room - 13C**

Location: Hargreaves Hall, Reading Room - 13C

*Speakers: Olin Anderson*

*Faculty Mentors: Paul Schimpf*

8:30am – 10:00am

**Removal of Surface Sialic Acid Impairs Osteoclast Differentiation: Location: Hargreaves Hall, Reading Room - 1B**

Location: Hargreaves Hall, Reading Room - 1B

*Speakers: Charles Johnson*

*Faculty Mentors: Jason Ashley*

8:30am – 10:00am

**Selecting Seed Provenance for Palouse Prairie Restoration: Location: Hargreaves Hall, Reading Room - 2C**

Location: Hargreaves Hall, Reading Room - 2C

*Speakers: Ethan Bean*

*Faculty Mentors: Rebecca Brown*



8:30am – 10:00am

**Synthesis of 2D and 3D Inorganic Coordination Networks with Unique and Unusual Electronic and Magnetic Properties: Location: Hargreaves Hall, Reading Room - 6A**

Location: Hargreaves Hall, Reading Room - 6A

*Speakers: Nathan Blair*

*Faculty Mentors: Eric Abbey, Jamie Manson*

8:30am – 10:00am

**The Response of Western Sword Fern to Precipitation and Climate Variation in Washington: Location: Hargreaves Hall, Reading Room - 28**

Location: Hargreaves Hall, Reading Room - 28

*Speakers: Jenny Harrington*

*Faculty Mentors: Ruth Kirkpatrick*

8:30am – 10:00am

**Unconfined Compressive Strength of the Soil Underlying the New Interdisciplinary Science Center Building: Location: Hargreaves Hall, Reading Room - 19**

Location: Hargreaves Hall, Reading Room - 19

*Speakers: Richard Souders*

*Faculty Mentors: Richard Orndorff*

8:30am – 10:00am

**X-ray Acoustic Computer Tomography (XACT) as new imaging technique to reduce radiation dose and improve image quality: Location: Hargreaves Hall, Reading Room - 14C**

Location: Hargreaves Hall, Reading Room - 14C

*Speakers: Abdullah Alabdulmohsin, Anna Gudima*  
*Faculty Mentors: Ali Zarafshani*

# Poster Session II

10:20 a.m. - 11:50 a.m.

10:20am – 11:50am

**'Tis the Season: A study on the Seasonal Variance of Altruistic Behaviors: Location: Hargreaves Hall, Reading Room - 4C**

Location: Hargreaves Hall, Reading Room - 4C

*Speakers: Greysen Danae*

*Faculty Mentors: Mark Holmgren*

10:20am – 11:50am

**18 Year Old Female Collegiate Volleyball Player with Impaction Fracture of Talus: Location: Hargreaves Hall, Reading Room - 12B**

Location: Hargreaves Hall, Reading Room - 12B

*Speakers: Tyler Hollmann, Mckenna Patrick*

*Faculty Mentors: John Gerber*

10:20am – 11:50am

**18-year-old Female Division 1 Volleyball Player with Nerve Damage Post ACL & MCL Surgery: Location: Hargreaves Hall, Reading Room - 13A**

Location: Hargreaves Hall, Reading Room - 13A

*Speakers: Inga Erickson, Harli Spurgeon*

*Faculty Mentors: John Gerber*

10:20am – 11:50am

**18-year-old with a Superior Labral Tear: Location: Hargreaves Hall, Reading Room - 13B**

Location: Hargreaves Hall, Reading Room - 13B

*Speakers: Sarah Bailey*

*Faculty Mentors: John Gerber*

10:20am – 11:50am

**19 Year Old Female Division I Collegiate Basketball Player with Bilateral Knee Debridement: A Case Report: Location: Hargreaves Hall, Reading Room - 13C**

Location: Hargreaves Hall, Reading Room - 13C

*Speakers: Claudia Rodwell, Shawn Semb*

*Faculty Mentors: John Gerber*

10:20am – 11:50am

**19 Year Old Female with Patella Femoral Pain & Diabetes: Location: Hargreaves Hall, Reading Room - 12C**

Location: Hargreaves Hall, Reading Room - 12C

*Speakers: Lowell Kovacich*

*Faculty Mentors: John Gerber*

10:20am – 11:50am

**A report on generating social marketing messages from the results of a cross-sectional study in an effort to reduce single-use plastic among college students.:**  
**Location: Hargreaves Hall, Reading Room - 17**

Location: Hargreaves Hall, Reading Room - 17

*Speakers: Sarah Olson, McKayla Elliott*  
*Faculty Mentors: Sarah Mount*

10:20am – 11:50am

**Althea Gibson: Tennis Extraordinaire: Location: Hargreaves Hall, Reading Room - 14B**

Location: Hargreaves Hall, Reading Room - 14B

*Speakers: Reilly Responte*  
*Faculty Mentors: Chadron Hazelbaker*

10:20am – 11:50am

**Alzheimers, Dementia, and resilience: Location: Hargreaves Hall, Reading Room - 9A**

Location: Hargreaves Hall, Reading Room - 9A

*Speakers: Nichole Zeober*  
*Faculty Mentors: Rie Kobayashi*

10:20am – 11:50am

**Analysis of Helicobacter pylori sRNA-cagII and sRNA-cagIII and Identification of Genes they Regulate: Location: Hargreaves Hall, Reading Room - 14C**

Location: Hargreaves Hall, Reading Room - 14C

*Speakers: Brandon Flatgard*

*Faculty Mentors: Andrea Castillo*

10:20am – 11:50am

**Are You The One in Three?: Location: Hargreaves Hall, Reading Room - 1B**

Location: Hargreaves Hall, Reading Room - 1B

*Speakers: Angelina Chesakov, Carly Bates, Corrine Dalhaus, Vera Parks*

*Faculty Mentors: Rosalee Allan*

10:20am – 11:50am

**Assessment of the Verbal Behavior and Milestones Assessment and Placement Program: Location: Hargreaves Hall, Reading Room - 21**

Location: Hargreaves Hall, Reading Room - 21

*Speakers: Erika Glunz*

*Faculty Mentors: Jessica Urschel*

10:20am – 11:50am

**Communication Through the Arts for People Living with Dementia: Location: Hargreaves Hall, Reading Room - 8C**

Location: Hargreaves Hall, Reading Room - 8C

*Speakers: Anne Howard*

*Faculty Mentors: Rie Kobayashi*

10:20am – 11:50am

**Comparison of power production indices during seated and standing Wingate anaerobic tests in young adults : Location: Hargreaves Hall, Reading Room - 20**

Location: Hargreaves Hall, Reading Room - 20

*Speakers: Caleb Overturf, Jeff Ford, Hannah Ewert, Brandon Smith, Chuy Garcia, Brandon Wilbert*

*Faculty Mentors: Katrina Taylor*

10:20am – 11:50am

**Creating Dementia-Friendly Community- A Culture Shift Using Techniques By Dr. Al Power: Location: Hargreaves Hall, Reading Room - 8A**

Location: Hargreaves Hall, Reading Room - 8A

*Speakers: Ahna Soli*

*Faculty Mentors: Rie Kobayashi*

10:20am – 11:50am

**Defining Success in Service-Learning: Location: Hargreaves Hall, Reading Room - 7A**

Location: Hargreaves Hall, Reading Room - 7A

*Speakers: Vikram Gill*

*Faculty Mentors: Teena Carnegie*

10:20am – 11:50am

**Division I Female Soccer player with Type I Chiari Malformation: Location: Hargreaves Hall, Reading Room - 4A**

Location: Hargreaves Hall, Reading Room - 4A

*Speakers: Tyler Daigneault*

*Faculty Mentors: John Gerber*

10:20am – 11:50am

**Effect of Static Hip Flexor Stretching on Standing Pelvic Tilt and Lumbar Lordosis: Location: Hargreaves Hall, Reading Room - 10B**

Location: Hargreaves Hall, Reading Room - 10B

*Speakers: Samantha Baker, Sebastian Lopez, Benjamin Adams, Zach Eagle*

*Faculty Mentors: Jeni McNeal*



10:20am – 11:50am

**Effective Communication in Service Learning: Location: Hargreaves Hall, Reading Room - 5C**

Location: Hargreaves Hall, Reading Room - 5C

*Speakers: Phillip Smelser*

*Faculty Mentors: Teena Carnegie*

10:20am – 11:50am

**Effects of a Tactile Safeness Intervention on Experiences of Shame and Compassion: Location: Hargreaves Hall, Reading Room - 18**

Location: Hargreaves Hall, Reading Room - 18

*Speakers: Jamie Baum, Dana Billena*

*Faculty Mentors: Russell Kolts*

10:20am – 11:50am

**Effects of restoration techniques on wetland macroinvertebrate abundance and diversity in and around Turnbull National Wildlife Refuge: Location: Hargreaves Hall, Reading Room - 11C**

Location: Hargreaves Hall, Reading Room - 11C

*Speakers: Dechen Edwards*

*Faculty Mentors: Joanna Joyner-Matos*

10:20am – 11:50am

**Effects of Video Games as Stress Reliever Between College Majors: Location: Hargreaves Hall, Reading Room - 15C**

Location: Hargreaves Hall, Reading Room - 15C

*Speakers: Elizabeth Olson, Stephanie Preston, Emma Bayuk, Abigail Brayman*  
*Faculty Mentors: Heidi Hillman*

10:20am – 11:50am

**Engineering Lactococcus Lactis as an Alternative Treatment for Multiple Sclerosis: Location: Hargreaves Hall, Reading Room - 3A**

Location: Hargreaves Hall, Reading Room - 3A

*Speakers: Marcos Monteiro*  
*Faculty Mentors: Andrea Castillo, Javier Ochoa-Reparaz*

10:20am – 11:50am

**Factors in Graduation of EWU Students: Location: Hargreaves Hall, Reading Room - 10C**

Location: Hargreaves Hall, Reading Room - 10C

*Speakers: Aaron Hope*  
*Faculty Mentors: Krisztian Magori*

10:20am – 11:50am

**Family Financial Stressors on Latinx Students: Location: Hargreaves Hall, Reading Room - 1A**

Location: Hargreaves Hall, Reading Room - 1A

*Speakers: Marixza Torres*

*Faculty Mentors: Theresa Martin*

10:20am – 11:50am

**Feasibility of X-ray induced Acoustic Signals to measure the proportional radiation does during clinical radiotherapy: Location: Hargreaves Hall, Reading Room - 26**

Location: Hargreaves Hall, Reading Room - 26

*Speakers: Anna Gudima, Abdullah Alabdulmohsin*

*Faculty Mentors: Ali Zarafshani*

10:20am – 11:50am

**Grandparents as Kinship Care Providers : Location: Hargreaves Hall, Reading Room - 27**

Location: Hargreaves Hall, Reading Room - 27

*Speakers: Carissa Shaw*

*Faculty Mentors: Daniel Ruddell*

10:20am – 11:50am

**Homelessness within Spokane- how can we make a difference?: Location: Hargreaves Hall, Reading Room - 9B**

Location: Hargreaves Hall, Reading Room - 9B

*Speakers: Jenne DeLeon, Suhail Alghamdi, Zahra Alhamili, Natalie Fiallos*  
*Faculty Mentors: Rosalee Allan*

10:20am – 11:50am

**Increasing Female Student Enrollment in K-12 STEM Programs: Location: Hargreaves Hall, Reading Room - 29**

Location: Hargreaves Hall, Reading Room - 29

*Speakers: Aaron Howe*  
*Faculty Mentors: Daniel Ruddell*

10:20am – 11:50am

**Is Hospital Price Transparency Resulting in Medical Tourism?: Location: Hargreaves Hall, Reading Room - 2B**

Location: Hargreaves Hall, Reading Room - 2B

*Speakers: Mckenzie Kooch, Erin Codd, Brooke Henderson, Kameron McCardell*  
*Faculty Mentors: Rosalee Allan*

10:20am – 11:50am

**Long Term Care Benefits for Aging American Veterans: Location: Hargreaves Hall, Reading Room - 28**

Location: Hargreaves Hall, Reading Room - 28

*Speakers: Claudette Becker*

*Faculty Mentors: Daniel Ruddell*

10:20am – 11:50am

**Lung cancer survivors who continue smoking after diagnosis are more likely to be living with an individual who smokes: Location: Hargreaves Hall, Reading Room - 3C**

Location: Hargreaves Hall, Reading Room - 3C

*Speakers: Sue Treppenhauer, Amy Stine*

*Faculty Mentors: Kevin Criswell*

10:20am – 11:50am

**Maximizing Our Professional Potential: Location: Hargreaves Hall, Reading Room - 8B**

Location: Hargreaves Hall, Reading Room - 8B

*Speakers: Susanne Wimberley*

*Faculty Mentors: Rie Kobayashi*

10:20am – 11:50am

**Meet My Needs First: Non Pharmacological Interventions: Location: Hargreaves Hall, Reading Room - 7B**

Location: Hargreaves Hall, Reading Room - 7B

*Speakers: Holly Buche*

*Faculty Mentors: Rie Kobayashi*

10:20am – 11:50am

**Modernization doctrine: Through oil exploration and It's impact in the Niger, Delta, Nigeria: Location: Hargreaves Hall, Reading Room - 11B**

Location: Hargreaves Hall, Reading Room - 11B

*Speakers: Malachi Chukwu*

*Faculty Mentors: Dorothy Zeisler-Vralsted*

10:20am – 11:50am

**Orange You Glad You Were Wearing Blue?!: Location: Hargreaves Hall, Reading Room - 16**

Location: Hargreaves Hall, Reading Room - 16

*Speakers: Kaela Holm, Justin Dunfee, Danielle Ramos*

*Faculty Mentors: Heidi Hillman*

10:20am – 11:50am

**Parental Rearing Styles, Child Abuse, Borderline Personality Traits, and Suicide:**  
**Location: Hargreaves Hall, Reading Room - 24**

Location: Hargreaves Hall, Reading Room - 24

*Speakers: Max Barham, Rachel Overland, Emma Wasser, Annika Rauch, Jacqueline Adams*

*Faculty Mentors: William Williams*

10:20am – 11:50am

**Positive Bias in Positive Psychology: Location: Hargreaves Hall, Reading Room - 22**

Location: Hargreaves Hall, Reading Room - 22

*Speakers: Brandy Hutton, Max Barham*

*Faculty Mentors: Philip Watkins*

10:20am – 11:50am

**Quality Senior Living: Location: Hargreaves Hall, Reading Room - 7C**

Location: Hargreaves Hall, Reading Room - 7C

*Speakers: Jessica Kinney, Ashley Hansen*

*Faculty Mentors: Rie Kobayashi*

10:20am – 11:50am

**Relationship Between Vaccination Hesitation and Measles Outbreak in the U.S.:**  
**Location: Hargreaves Hall, Reading Room - 10A**

Location: Hargreaves Hall, Reading Room - 10A

*Speakers: Maria Larios, Courtney Boles, Lidize Deleon, Katherine Woods*  
*Faculty Mentors: Rosalee Allan*

10:20am – 11:50am

**Relationship Between Vaccination Hesitation and Measles Outbreak in the U.S.:**  
**Location: Hargreaves Hall, Reading Room - 9C**

Location: Hargreaves Hall, Reading Room - 9C

*Speakers: Maria Larios, Katherine Woods, Courtney Boles, Lidize Deleon*  
*Faculty Mentors: Rosalee Allan*

10:20am – 11:50am

**Service Learning and Professional Accountability: Location: Hargreaves Hall,**  
**Reading Room - 6B**

Location: Hargreaves Hall, Reading Room - 6B

*Speakers: Brandon Munson*  
*Faculty Mentors: Teena Carnegie*



10:20am – 11:50am

**Service Learning for Students on Campus: Location: Hargreaves Hall, Reading Room - 2C**

Location: Hargreaves Hall, Reading Room - 2C

*Speakers: Madeline Le*

*Faculty Mentors: Teena Carnegie*

10:20am – 11:50am

**Service Learning: Location: Hargreaves Hall, Reading Room - 5B**

Location: Hargreaves Hall, Reading Room - 5B

*Speakers: Mayra Zuniga Sanchez*

*Faculty Mentors: Teena Carnegie*

10:20am – 11:50am

**Service-Learning & Ensuring Usability in a University Setting: Location: Hargreaves Hall, Reading Room - 6C**

Location: Hargreaves Hall, Reading Room - 6C

*Speakers: Timothy Linton*

*Faculty Mentors: Teena Carnegie*

10:20am – 11:50am

**Service-learning: Effectively Transitioning Students Into the Workplace: Location: Hargreaves Hall, Reading Room - 6A**

Location: Hargreaves Hall, Reading Room - 6A

*Speakers: Rachel Bean*

*Faculty Mentors: Teena Carnegie*

10:20am – 11:50am

**SKILLED NURSING FACILITY 911 CALLS/ EMERGENCY ROOM VISITS AND SOLUTIONS FOR REDUCTION: Location: Hargreaves Hall, Reading Room - 1C**

Location: Hargreaves Hall, Reading Room - 1C

*Speakers: John Gannon, Christopher Davis, Nathan Main*

*Faculty Mentors: Rosalee Allan*

10:20am – 11:50am

**Symptom burden and time since diagnosis are associated with quitting smoking in lung cancer survivors: Location: Hargreaves Hall, Reading Room - 3B**

Location: Hargreaves Hall, Reading Room - 3B

*Speakers: Amy Stine, Sue Treppenhauer*

*Faculty Mentors: Kevin Criswell*

10:20am – 11:50am

**Talking is Teaching: Location: Hargreaves Hall, Reading Room - 15B**

Location: Hargreaves Hall, Reading Room - 15B

*Speakers: Jamie Baum, Thailer Whitley*

*Faculty Mentors: Shanna Davis, Allison Wilson*

10:20am – 11:50am

**Telepsychiatry: Improving Psychiatric Services in Remote Skilled Nursing Facilities:  
Location: Hargreaves Hall, Reading Room - 2A**

Location: Hargreaves Hall, Reading Room - 2A

*Speakers: Andrew Taylor, Greta Dauer, Taylor Kaech*

*Faculty Mentors: Rosalee Allan*

10:20am – 11:50am

**The Association Between Race and Attitudes About Interracial Relationships:  
Location: Hargreaves Hall, Reading Room - 19**

Location: Hargreaves Hall, Reading Room - 19

*Speakers: Micah Brown*

*Faculty Mentors: Jessica Urschel*

10:20am – 11:50am

**The Association of Emotion Dysregulation with Borderline Personality and Its Symptoms: Location: Hargreaves Hall, Reading Room - 23**

Location: Hargreaves Hall, Reading Room - 23

*Speakers: Max Barham, Rachel Overland, Emma Wasser, Annika Rauch, Jacqueline Adams*

*Faculty Mentors: William Williams*

10:20am – 11:50am

**The Effect of Rural Healthcare Experience on Future Practice Location for Primary Care Professions in Rural Counties of Washington State (HS-5513): Location: Hargreaves Hall, Reading Room - 12A**

Location: Hargreaves Hall, Reading Room - 12A

*Speakers: Luis Vela*

*Faculty Mentors: Anna Tresidder*

10:20am – 11:50am

**The Girls of Fort Shaw: Location: Hargreaves Hall, Reading Room - 14A**

Location: Hargreaves Hall, Reading Room - 14A

*Speakers: Jessica Thoens*

*Faculty Mentors: Chadron Hazelbaker*

10:20am – 11:50am

**The Regulation of Self Following a Traumatic Brain Injury: Location: Hargreaves Hall, Reading Room - 15A**

Location: Hargreaves Hall, Reading Room - 15A

*Speakers: Nicholas Mehrnoosh, Marysa Rogozynski*  
*Faculty Mentors: Jonathan Anderson*

10:20am – 11:50am

**The United States' Practice of Bilateral Foreign Aid Does More Harm Than Good: Location: Hargreaves Hall, Reading Room - 5A**

Location: Hargreaves Hall, Reading Room - 5A

*Speakers: Christian Turner*  
*Faculty Mentors: Majid Sharifi*

10:20am – 11:50am

**Understanding the Venezuelan Crisis and the Broader Context of American Intervention in Latin America.: Location: Hargreaves Hall, Reading Room - 11A**

Location: Hargreaves Hall, Reading Room - 11A

*Speakers: Gloria Bravo*  
*Faculty Mentors: Majid Sharifi*

10:20am – 11:50am

**Validity of air displacement plethysmography compared to A-mode ultrasound in young adults: Location: Hargreaves Hall, Reading Room - 25**

Location: Hargreaves Hall, Reading Room - 25

*Speakers: Kaeli Shockley, Bailee Wohl, Erika Demmert, Carlie Storm, Buiford Martin, Zak Longoria*

*Faculty Mentors: Katrina Taylor*

# Creative Works Project Descriptions

**Abuse: Location: Fine Arts Center - Art Gallery**

*Speakers: Gisselle Garcia*

*Faculty Mentors: Joshua Hobson*

These photographs are a representation of my internal and external journeys that I have overcome in life. Whether it's physical or mental pain, everyone has dealt with some sort of pain in their lives. My intention was to create a narrative that viewers could potentially relate to. A statistic that has stuck with me and that I strive to change is that more than 1 in 3 women, and more than 1 in 4 men in the United States have experienced rape, or physical violence by an intimate partner in their life. My original inspiration for these photographs came from my childhood. Growing up in an abusive household and later on in life experiencing it again in a relationship led me to create these disturbing images. It is difficult to be vulnerable and open up to my audience but I feel like this is a touchy subject for people and I want everyone to know that they have a voice and people to reach out to for help.

National Domestic Violence Hotline 1-800-799-7233

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**Blustery Night: Location: Fine Arts Center - Art Gallery**

*Speakers: Annie Shiner*

*Faculty Mentors: Jenny Hyde*

This piece is a digital work that is intended to offer the viewer a glimpse into a dramatic night scene. The viewer is given the opportunity to examine both the interior and exterior of a construct, which allows them to compare the work of mankind with the more natural elements.

With its cool undertones, the feeling this piece evokes is that of suspense. The colors displayed across the entirety of this piece are compatible but muted. A medium teal on the interior of the structure is filled with shadows and even the windows offer a view of barren trees having lost all their leaves to the cold and wind which continues to rustle its branches, these trees are backed only by a dark starry sky.

The camera appears to pan left past a dividing staircase and into the outside world. As the viewer is taken into the elements, the landscape stretches away before the camera pauses and begins pan to back to the right. When returning from the elements, a dark silhouette of a childlike figure can partially be seen at the top of the steps. He drops a red ball which bounces on each step as it descends. The camera continues to pan right, and we are taken back inside where through the windows the trees can be seen rustling and the stars continue to twinkle.

**Kids These Days: Location: Fine Arts Center - Art Gallery**

*Speakers: Timothy Lacey III*

*Faculty Mentors: Greg duMonthier*

A sculpture which was given parameters  
of futility and to represent the body.

A wounded wand with its goatsbeard  
reaching from the cracks.

A rumbling scooter ridden by a child  
who has made their self invisible.

A tooth flailing at the cusp,  
waving out at its apogee.

A single sock and pair of gloves—  
serving as identity.

A parody on the death of imagination,  
on the surrogation of adolescence.

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**Losing touch: Location: Fine Arts Center - Art Gallery**

*Speakers: Madeline McGinn*

*Faculty Mentors: Margot Casstevens*

Lithographs

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**Pressure: Location: Fine Arts Center - Art Gallery**

*Speakers: Tyler Koven*

*Faculty Mentors: Jenny Hyde*

Pressure is a piece exploring the pressures of life pressing down on you. The yellow swirl is a goal trying to be reached, and the tentacles are obstacles standing in your way. While the black lines are thoughts and feelings jumping around your head.

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**Prolonging the Inevitable: Location: Fine Arts Center - Art 113B**

*Speakers: Madison Jones*

*Faculty Mentors: Jenny Hyde*

This animation was created by digital painting and illustration, and it was created to delve into the relationship between artificial life and death. It explores the creation of life in order to prolong the human lifespan and the morality of lengthening it.



**Self Portrait: Location: Fine Arts Center - Art Gallery**

*Speakers: Erika Symonenko*

*Faculty Mentors: Jenny Hyde*

Self Portrait digital painting in an 18'×20' frame.

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**Spot Healing: 1: Location: Fine Arts Center - Art Gallery**

*Speakers: Sierra Dawson*

*Faculty Mentors: Josh Hobson, Jenny Hyde*

I have become deeply interested in the changes that are constantly taking place in our everyday lives. My recent work engages with the way everything around us is subtly being adjusted and how people, places, and things that were once so comfortable and intimate can become so unfamiliar and foreign. Does photographic documentation really help us to remember the past? Studies show that pictures put our cognitive effort into the photograph but not our personal memory. This may assist our memory, but it can also replace it. Why do we only remember certain parts of our past while forgetting others? Are things exactly as we recall them? I often find myself remembering mostly fragments or distortions of my past.

Through my photography, painting, and digital work, I explore the idea of personal transformation by manipulating images with a direct connection to my past. By removing key pieces in my work that were once there or by dismantling a precious memory, I hope to evoke a sense of reflection in my viewer where one can stop and try to imagine all the changes that have occurred within their own life.

My intention of working primarily with black and white square images is to create a sense of somberness while directly referencing early photography. By collaborating with the new development of technology and photo editing tools, I create a metaphor through my process by manipulating important parts of my world, or removing them, similar to what we do with our memory. My finished works are simply the residue of my actions the same way memories are the result of recontextualization and recall.

Related inspirational artists:

Lucas Blalock, Ernesto Artillo, Nikki Lee, Paul Pfiffer, Andy Goldsworthy, Duane Michals and Hannah Hoch.

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**The Greater Litaglon: Location: Fine Arts Center - Art Gallery**

*Speakers: Leslie Kolke*

*Faculty Mentors: Reinaldo Gil Zambrano*

The Greater Litaglon is the name of an imaginary creature of my own invention, made with a mixture of toucans, two species of hornbill birds, leopard geckos, tokay geckos, tree frogs, pangolins, and cats. I designed them to be agile, arboreal omnivores, gracefully navigating their home environment of damp, dark jungles interspersed with giant fungi. The Litaglon is my personal culmination of pure imagination, showcasing the depths of unconventional fantasy and stretching colored pencil to its relatively uncommon potential as a medium, for both illustration and fine art. Drawing this

piece alone took 60 hours, not counting weeks of character studies, poses, light studies, color studies, environmental sketches, and thumbnail drawings. It is most importantly, however, a display of whimsy and playfulness that undermines the amount of work that was needed, and focuses instead on the comical interaction of the creatures within.

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**Tutho: Location: Fine Arts Center - Art Gallery**

*Speakers: Mario Mendez*

*Faculty Mentors: Jenny Hyde*

This work is a digital work made with mixed media (A sketch was scanned in and edited after with Illustrator, Photoshop, and After Effects). Intended to be an exploration of introductions that one may see in, for example, a video game, that one may see before starting the game itself. The image envisions a world that places a previous creature design, and a world where one would find the creature. This piece was meant to encapsulate the drive and wonder that a consumer of something like video games through animation and sound would experience when they get something new- a new experience, lore, and the want to play a game like this.

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**Webster's Insanity: Location: Fine Arts Center - Art Gallery**

*Speakers: Brandt Wurzer*

*Faculty Mentors: Greg duMonthier*

This sculpture mimics a household item that could have been used in the 1960's. It was created to stimulate one's imagination by asking the viewer to understand its function. The combination of two polar opposites; a vacuum cleaner and a glitter dispenser poses an issue that directs to its own futility. Its infinite rhythm could be related to our own everyday life.

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**A Star's Journey: Location: Fine Arts Center - Art Gallery**

*Speakers: Samuel Jenkins*

*Faculty Mentors: Jonathan Middleton*

This is a musical representation of one of the possible courses of the life of a star in space. It is divided up into four movements but is one continuous piece, without a break between each movement. Each movement represents a stage in the star's life. The first begins with a star's origin, a nebula, and ends with the dust in the nebula beginning to create the molecular structures of a star. The second picks up where the first left off: it fully develops this concept of molecular creation of a star and ends with the star fully formed and functional. In the third, the star emits its energy and gradually grows old; this movement ends with the star's life dramatically ending as it begins to collapse into a black hole. The fourth is the continuation of this collapse, ending with a total black hole, huge and ominous but somehow peaceful in its own respect. The instrumentation for this piece is seven instruments: string quartet, piano, marimba, and vibraphone. I sought to convey, through the instrumentation, a sense of the atmosphere of space.

**Call This What It Is: Location: Fine Arts Center - Art Gallery***Speakers: Carl Christensen**Faculty Mentors: Jonathan Middleton*

“Call This What It Is” is a song about paralysis induced by infatuation. Originally released on my self released album Arrivals and Departures and recorded as a Bon Iver/ Kanye West inspired One-Man-Auto-Tune choir. For the Symposium I aim to rewrite the song to take full advantage of the unique performance space presented by the art gallery where the symposium is located. This song will feature myself, a group of vocalists, and two saxophones. I will be placed in front of the audience, the other vocalists will be singing from either side of the audience and the saxophones will be located in the upper level of the gallery, playing into the gallery at the audience. By spreading out the performers I hope to create a musical experience completely unique to the architecture of the art gallery. By completely surrounding the audience with performers my goal is to completely envelop them with sound and reverberation.

**Extension: Location: Fine Arts Center - Art Gallery***Speakers: Diana Viskova**Faculty Mentors: Don Goodwin, Jonathan Middleton*

The composition is of jazz influences and is inspired by the concept of "dissonance". Dissonances create tension and harmonic clash which require resolution, allowing the listener to be pulled into the harmonic tension until resolved. Rhythmic motifs are used in order to drive the tension of pitches throughout the piece. In order to break the predictability of the composition, breaks in time is created, initiating air tension in the unexpected space between pitches. The composition also explores the concept of numbers. The numbers five and three have been the focus of the theme in the composition. Specifically, the fifth scale degree and the third scale degree of the key the piece is written in, have been a starting and landing point in the melodic shape of the theme. Also, the number seven has been the rhythmic motif in the composition since harmonies last seven rhythmically executed beats before changing the harmonic chord quality. Altogether, the essence and focus of the composition has been numbers and tension created through dissonance in pitch and space.

**Sand and Dust/Groves: Location: Fine Arts Center - Art Gallery***Speakers: Nathan Sumerlin**Faculty Mentors: Jonathan Middleton*

“Sand and Dust” and “Groves” are two parts of a larger journey, each movement going through a different environment. Each movement is played on a different saxophone. “Sand and Dust” is played on a soprano saxophone, and “Groves” is played on an alto saxophone. Both accompanied by two marimbas.

“Sand and Dust” is a journey through a desert, and into an old, unexplored tomb. It has themes of adventure, discovery, and danger. Journey through desert villages and into an ancient mausoleum, full of danger and exploration.

“Groves” is a trip through a fantasy forest, filled with lights of all shades and colors. Move in between with each of these colors with a childlike innocence, each one bringing new and different ideas and emotions.

**Through the woods: Location: Fine Arts Center - Art Gallery**

*Speakers: Grace Nall*

*Faculty Mentors: Don Goodwin, Jonathan Middleton*

Through the Woods is a composition I made about walking through the forest, with all the twists and turns it is much like life, where you eventually find the sunny and beautiful sides. I have had to face so many challenges in college, personally and professionally, and it's not been easy, but I know that one day I will find the beautiful and peaceful side. In the piece it will start off slow, but then kick into a faster tempo by the 22nd measure and eventually end on the I chord, or the beautiful side of the forest, as I would say. When the piece changes over to the faster tempo the left hand of the marimba is still playing the same pattern we heard before, but as eighth notes now, and the right hand displays a lot of the same ideas and melody to represent that life changes, but you will still be trying to find that beautiful side, and eventually we reach that beautiful side of the forest leaving our minds and hearts full.

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**Musical Theatre Scholarship Audition: Location: Fine Arts Center - Theatre Stage**

*Speakers: MJ Daly*

*Faculty Mentors: Sara Goff, Jeff Sanders*

The Musical Theatre Scholarship Auditions are held during the Kennedy Center American College Theatre Festival every year in eight different regions. It is an opportunity for students to showcase their skills, with the winners from each region earning an all-expenses paid trip to the Kennedy Center in Washington D.C. for the national festival. In the finals round of the audition, each actor has five minutes to sing from two songs in their repertoire. This year I sang "The Movie in My Mind" from Miss Saigon, and "Gorgeous" from The Apple Tree and won the Region VII competition. I would love to present that audition at symposium.

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**She Used To Be Mine: Location: Fine Arts Center - Theatre Stage**

*Speakers: Holly Kirkman*

*Faculty Mentors: Sara Goff*

I will be singing She Used To Be Mine from Waitress The Musical.

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**The Sacrifice at Aulis: Location: Fine Arts Center - Theatre Stage**

*Speakers: Brittany Lael, Mica Pointer, Tristan Roseff, MJ Daly*

*Faculty Mentors: Sara Goff*

As King Agamemnon prepares to sail for Troy, the winds are strangely unwilling to blow. When the king finds himself in a position where his honour, his family, and the wrath of the gods are all pitted against each other, he and his entire family are brought to their knees when Agamemnon must atone for his past wrongs by making the ultimate sacrifice. Adapted from Euripides' play 'Iphigeneia in Aulis,' EWU students play the roles of Clytemnestra, Agamemnon, and their daughter Iphigeneia.

**They did their best to keep me: Location: Fine Arts Center - Art Gallery***Speakers: Tommie Tucker**Faculty Mentors: Margot Casstevens*

I was inspired to create a series of prints in response to our history of immigration. We have a rich legacy of immigrants and yet we fear and mistreat them. This work was created through the lens of my family's immigration story; the reasons why they left their home. Most of this nation's residents are immigrants with a similar history. This suite of collagraph prints, whose imagery is inspired by my great grandfather's writings, shares his story.

**Aloha 'āina - in color: Location: Fine Arts Center - Art Gallery***Speakers: Jessie Coney**Faculty Mentors: Margot Casstevens*

After being born and raised in Hawai'i and attending a school for those with Hawaiian descent, my culture, knowledge and nā mo'olelo (the stories) that have been past down make me who I am today. Once moving to Washington to attend Eastern Washington University my goal has been to shed light of Hawai'i to as many people as I possibly could, whether it be through class projects or casual conversation. This project represents five indigenous Hawaiian/ Polynesian plants. Each plant the I chose to show has a purpose or story paired to it. The plants I am showcasing are the Ti leaf (Ki), Laua'e, Hala, Kalo, and Naupaka. These prints were created with collagraphs as well as the Chine-collé printmaking technique.

**Emotional Narrative: Location: Fine Arts Center - Art Gallery***Speakers: Amanda Hartman**Faculty Mentors: Joshua Hobson*

The narrative I want to tell with these photographs is an abstract, non-linear one, based around the feelings that can come with the death of a parent or loved one. The idea came from a previous class' design project. It was a fifty-panel non-representational comic that was supposed to be based on a personal experience of our choice. The personal experience I chose was the events around the passing's of both my parents. I then decided to pick ten out of those fifty panels that represented powerful emotions (for example: anger, depression, anxiety, etc.) to turn into physical artworks that I would photograph and alter in Photoshop.

First, I outlined and cut out ten different sized square and rectangle panels from canvas paper. Then I started roughly recreating my drawings with only black and white materials, such as: acrylic paint, modeling paste, sand, glitter, and shaving cream. I also used various tools, like; sponges, pallet knives, and a range of brushes to increase the texture. Once they all dried, I photographed each panel individually in my small pop-up studio, angling the bright LED lights to create shadows and show as much detail as possible.

After I downloaded the images on my computer, I played around with the hue in photoshop, adding subtle colors to each picture, trying to make it look like it was originally painted with that color. I also increased the details significantly to emphasize how intense the emotions are and to make it look as realistic as possible when printed. I want people to think

they can feel the texture by touching the photo. Lastly, even though every image represents a certain feeling to me, I don't want to label each one because I'd rather the people that view the print decide what it represents to them.

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**Get Some Sleep : Location: Fine Arts Center - Film Room**

*Speakers: Kira Westlund*

*Faculty Mentors: Chase Ogden*

A mixed-media, humor based documentary about the struggles involved with insomnia and depression. Half animation and half live action, this film finds the lighthearted moments in difficult situations.

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**Gut Punch: Location: Fine Arts Center - Film Room**

*Speakers: Evan Hoff, Elan Toby*

*Faculty Mentors: Chase Ogden*

A short film about a detective who falls for a hitman after her husband (and his mobster mistress) put a hit on her.

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**Life Unseen: Location: Fine Arts Center - Film Room**

*Speakers: Chase Ogden, Jacob Lundin*

This film explores the daily life of T.J. Breitenfeldt, a visually impaired Eastern Washington University student, and how he is able to overcome difficulties inherent with being blind.

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**The Disintegration Machine: Location: Fine Arts Center - Film Room**

*Speakers: Michael Mihalasky, Andrew Macshmann*

*Faculty Mentors: Chase Ogden*

In an attempt to pass his class, Mitch and his friend go to see their latest invention: the disintegration machine, with unknown consequences.

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**With War Comes Love: Location: Fine Arts Center - Film Room**

*Speakers: Jorge Valencia, Ana Valdovinos*

*Faculty Mentors: Chase Ogden*

A surrealist film about a woman named Gloria fighting her way out of a life full of physical and verbal abuse. She's shared her life with John, a Vietnam Vet for years but after a long battle surrounding their son she finally decides it's time to move forward.

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# Oral Abstracts

## **Elimination of Surface alpha2-3 Sialic Acid Impairs Osteoclast Maturation: Location: Senior Hall - Room 203**

*Speakers: Abigail Keever*

*Faculty Mentors: Jason Ashley*

The addition of terminal sialic acid (neuraminic acid) residues to cell surface proteins is a post-translational modification that promotes a variety of physiological events. Previous research investigating the importance of sialylation to osteoclast maturation found that removal of alpha2-6 sialic acids effectively repressed differentiation. In our analysis using RNA sequencing, we found that expression of alpha2-3 sialyltransferase, ST3Gal1, increases during differentiation in both male and female osteoclasts, but expression of N-acetylgalactosaminyltransferase, GALNT, is significantly down regulated in males relative to females. GALNT catalyzes the addition of the first glycan, N-acetylgalactosamine (GalNAc), to serine/threonine residues and serves as a substrate for alpha2-3 sialylation. Biosynthesis of glycan chains occurs in a highly sequential manner, therefore, it is possible that differences occurring at the beginning of the chain could result in differences at the terminal end. Given the previous findings on the importance of sialylation to osteoclastogenesis, female derived precursors could potentially be more sensitive to differentiation due to relative increased expression of GALNT. It is unknown if 1) terminal alpha2-3 sialylation is critical to osteoclast maturation and 2) whether de-sialylation has a greater impact on one sex over the other. To test this, we evaluated the effects of alpha2-3 specific de-sialylation in pre-committed male and female osteoclasts. We found that osteoclasts treated with the alpha2-3 neuraminidase were significantly smaller than those that continued to receive RANKL only. This effect was consistent for both males and females. Our results showed that removal of alpha2-3 linked sialic acid residues has deleterious effects on osteoclast differentiation, which further suggests that proper osteoclast fusion is glycosylation dependent.

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## **Klondike Fever: A Misdiagnosis: Location: Senior Hall - Room 306**

*Speakers: Brian O'Riley*

*Faculty Mentors: Ann Le Bar*

An in depth look at factors other than the Klondike Fever that influenced the stampede's purchasing decisions in Seattle during the Klondike Gold Rush.

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## **Looking at Diet and Possible Helminthic Parasite Interaction in *Canis latrans*: Location: Senior Hall - Room 204**

*Speakers: Martina Davis*

*Faculty Mentors: Krisztian Magori*

Turnbull Natural Wildlife Refuge (TNWR) provides an intricate ecosystem that supports several native vertebrate and invertebrate species, including *Canis latrans* (coyote). This study focuses on the interaction between diet and helminthic parasitic infection within the coyote population at TNWR, in particular, *Echinococcus multilocularis*, *Echinococcus*

granulosus and Taenia. The sylvatic life cycle of these helminthic parasites consists of two phases in two separate hosts called intermediate and definitive hosts respectively. Intermediate hosts of these parasites generally consist of mammals that the definitive host will ingest such as rodents or ungulates; whereas, the definitive host, which supports the adult stage of the parasites, are generally canids, in this case coyotes. This research aims to provide information about the potential helminthic parasitic infection in coyotes at TNWR by analyzing coyote scat using the Wisconsin double centrifugation technique method, PCR, and identification of small mammal bones.

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**Military Injustice: Transferring Military Justice to the Federal Judicial System: Location: Senior Hall - Room 221**

*Speakers: Ryan Soule*

*Faculty Mentors: Majid Sharifi*

The military justice system is a unique enforcement tool that military commanding officers have to administer justice in the armed forces. It's a form of justice where attorney's do not make the decision to charge or prosecute, that's completely at the discretion of the commanding officer. I believe that the military justice system fatal flaw is the fact that it can be easily influenced by unlawful influence either by senior commanders and/or Congress. I'm going to hopefully show that unlawful influence by senior commanders to subordinate commanders, members of Congress influencing subordinate commanders, and even military attorneys unlawfully influencing commanders. \_x000D\_

I believe that due to this unlawful influence that military justice jurisdiction should be transferred to the federal judicial system. I'm going to show this influence by case law that I've pulled from specific military branch appellate courts and the United States Court of Appeals for the Armed Forces. I'm also going to show this by comparing the sexual assault data with the military branches to those of of Spokane Count Superior Court. I believe that the data will show that military members on average are sent to trial more often than civilians, however the acquittal rate is higher. I believe the reason for this is due to the immense pressure that commanders have on them to send every case to a court martial regardless of the strength of the case and evidence.

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**Pain That We're Used To: A Sociological Analysis of Fight Culture in the National Hockey League: Location: Senior Hall - Room 302**

*Speakers: Shelby Miksch*

*Faculty Mentors: Logan Greene*

"I went to a fight the other night, and a hockey game broke out." – Rodney Dangerfield \_x000D\_

Few images in sports are as iconic as that of the battle-bloodied ice hockey enforcer. The role of the enforcer, commonly referred to as a "goon," is to intimidate players on the opposing team and to defend their own teammates against physical attack from opponents. Rodney Dangerfield's musings on the matter may have been humorous in their intent; that said, humor serves as a yardstick by which to measure reality. Fans do not watch hockey for the displays of athletic prowess. Or do they? \_x000D\_

How does one justify a level of brutality within a sport that would be considered criminal in almost any other venue?

After all, the defeated party in an ice hockey fight risks injury with consequences ranging from minor cosmetic flaws to



concussion or – in the extreme scenario – death. What narratives are used by players, teams, and fans to justify and perpetuate fight culture in North American professional ice hockey?

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**Passive versus Active Rest: a Study on Performance: Location: Senior Hall - Room 243**

*Speakers: Ireland Hendrix, Martin Waldrip, Iris Fiaui*

*Faculty Mentors: John Gerber*

Rest periods in sport—whether they be planned events or otherwise—can negatively impact player performance. These rest periods have been shown to decrease athletic performance measures, such as speed and quality of movement (Edholm, Krustup, and Randers, 2014). Conversely, some studies have shown that that periodic rest improved body mechanics and limited rating of perceived exertion (RPE) (Tugano et. al., 2017). Other studies show that active rest or re-warm ups can increase athletic performance. It is known that fatigue and high levels of RPE can lead to poor body kinematics and increased risk of injury in sport. It is unclear what sort of rest is best to optimize athletic performance, RPE, and form during competition. The purpose of this study is to identify whether total rest, a moderate intensity re-warm up, or active rest will optimize anaerobic power, agility, and muscular endurance as well as RPE and gross body movements in students at a Division I college. The participants will complete functional tasks that will require them to increase their heart rate, quantitative and qualitative data will be recorded for comparison; finally, the data will undergo statistical review.

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**Public Radio and the Podcast: The Battle of Audio Journalism: Location: Senior Hall - Room 304**

*Speakers: Jeremy Burnham*

*Faculty Mentors: Jamie Neely*

The internet's effects on print journalism are well documented. Less clear are the internet's effects on radio news. This study will examine whether public radio, such as NPR and its affiliates, should focus on its radio broadcasts to remain competitive or strike back with podcasts of its own. This project looks at reports from the Pew Research Center's State of the News Media Report and examines NPR's success with podcasts. It also includes an interview with Doug Nadvornick, the news director of NPR affiliate Spokane Public Radio. The research shows that podcasts give public radio additional tools to reach a bigger audience without negatively affecting listenership on traditional radio.

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**Tinder's Positive Influence on Relationship Satisfaction: Location: Senior Hall - Room 101**

*Speakers: Halli Campbell*

*Faculty Mentors: Theresa Martin*

As the world of dating evolves, online dating sites have dominated the dating world. With a growing percentage of society using online dating sites/apps, especially Tinder, there are a growing percentage of relationships coming out of it as well. Many studies have found online dating or traditional dating has no effect on relationship satisfaction. Respondents answered locally-developed questions about their use and/or familiarity of Tinder and their relationship satisfaction. There was a total of 47 respondents. Respondents ranged in age, with 70% being 18-23 years old. In this study we looked at

Tinder users and non-tinder users and their relationship satisfaction. Results were not significant which supports literature from Hobbs, Owen and Gerber.

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**'Tis the Season: A Study on The Seasonal Variance of Altruistic Behaviors: Location: Senior Hall - Room 201**

*Speakers: Greysen Danae*

*Faculty Mentors: Mark Holmgren*

Behavioral economics is concerned with the psychological factors that explain the economic decision-making of individuals. In many instances, decisions made by individuals are irrational violating an assumption of most economic models. One example of irrational behavior is altruism, where individuals act in the interest of others without the expectation of a reward. On the other hand, research by Ernst Fehr and Klaus M. Schmidt claim that altruism is a rational behavior because utility is gained by individuals who are inequity averse and thus, are still benefiting themselves through altruism. The purpose of this study is to discover which point in the year individuals behave with the highest levels of altruism. This is accomplished by using data collected through classroom experiments during different points in the year among different class levels. O.L.S. regression techniques are then employed to estimate the coefficients for each season. The results indicate that generosity among students occurs at the highest level during the winter quarter. These results are also compared to a previous study regarding the relationship between learning economics and altruism along with testing if loss aversion influences the behavior of students. Assuming students give altruistically at the same rates as the general public, the implication of the results suggests optimal fundraising may occur in the January-March time period.

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**Characterization of one-electron organoborohydride oxidation reactions via NMR: Location: Senior Hall - Room 304**

*Speakers: Caleb Allen*

*Faculty Mentors: Eric Abbey*

Organoborohydrides (RBH<sub>3</sub>) are well studied for their ability to donate hydrides and act as reducing agents. Several monoorganoborohydride (RBH<sub>3</sub>) molecules have been synthesized and their oxidation pathways were analyzed via computational analysis. The results were compared to those obtained with cyclic voltammetry to determine the one electron oxidation potentials. This research aims to characterize the reaction mechanism of one electron oxidation of borohydrides via nuclear magnetic resonance spectroscopy (NMR). The borohydrides are reacted with a one-electron oxidizing agent in the presence of a strong Lewis base, releasing dihydrogen as a byproduct along with the resulting organoborane (RBH<sub>2</sub>), which is trapped by the Lewis base. A greater understanding of this oxidation reaction will provide insight to the mechanism of both one and two-electron hydrogen release.

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**From the Closet to the Camps: The Persecution of Gays and Lesbians in 20th Century Germany: Location: Senior Hall - Room 306**

*Speakers: Logan Schoesler*

*Faculty Mentors: Ann Le Bar*

The discrimination and persecution of gays and lesbians is not something that is exclusive to Nazi Germany and has been a common occurrence in history. Starting in the early 1900s, gay people began to organize and create spaces for themselves in Weimar Germany. Homosexuality was criminalized but many in cities like Berlin were able to have a vibrant night life. As the Nazis began to take power, homosexuality became a threat to the German people, and those convicted of being a homosexual could be sent to concentration camps. Unlike other groups persecuted by Nazis, gays and lesbians were less likely to tell their stories after World War II because their sexuality was still criminalized, and they could be imprisoned again. The continued criminalization of homosexuality significantly delayed the gay liberation movement not only in Germany but around the western world.

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**Identifying food insecure students at a large regional university: Location: Senior Hall - Room 204**

*Speakers: Kianna Baker*

*Faculty Mentors: Sarah Mount*

The purpose of this study is to identify a possible link between food insecure college Students of color and previous family household food insecurity. The USDA defines food insecurity as, “a lack of consistent access to enough food for an active, healthy life” (U.S. Department of Agriculture [USDA], 2016). The matter of food insecurity is not an anomaly, as college students around the United States are critically affected by lack of resources to access and obtain healthy foods (Bruening, Brennhofner, Woerden, Todd, & Laska, 2016; Freudenberg et al., 2011; Patton-López, López-Cevallos, Cancel-Tirado, & Vazquez, 2014). Students of color, those receiving financial aid, and working students are more likely to report signs of food insecurity (Bruening, Brennhofner, Woerden, Todd, & Laska, 2016; Chaparro, Zaghoul, Holck, & Dobbs, 2009; Freudenberg et al., 2011; Gains, Robb, Knol, Sickler 2014; Patton-López 2014; Silva et al., 2015). This issue needs attention because food insecurity is detrimental to academic performance. Students affected are more likely to report low GPAs and fail out of classes (Bruening et al., 2016; Holben, 2010; Patton-López et al., 2014; Silva et al., 2015). As far as families, Vaccaro & Huffman 2017 noted that 26% of African American households, 22.4% of Hispanic households, and 11% of White non-Hispanic households reported food insecurity (Feeding America, 2017; U.S. Department of Agriculture, 2016). There is a possible relationship between household food insecurity and college food insecurity. Living in a food insecure household may be a predictor of experiencing food insecurity in college.

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**Impact of Conflict in Married v. Divorced Parents: Location: Senior Hall - Room 101**

*Speakers: Dechen Edwards*

*Faculty Mentors: Theresa Martin*

The purpose of this study is to examine a) parent-child relationships for adults whose parents were or were not divorced and b) the amount of conflict frequencies between parents in both groups. Using SONA systems department recruiting system, students at Eastern Washington University (n=404) completed measures of parental conflict. Preliminary results indicated that adults whose parents had divorced reported significantly more parental conflict than those whose parents remained married. Additionally, adults whose parents had divorced reported less desire to model their parents compared to those whose parents did not divorce.

**Neighborhood Built Environment, Gentrification, and Subjective Experiences of Walkability: A Comparison of a Low and High Walk Score® Neighborhood: Location: Senior Hall - Room 201**

*Speakers: Lisa Coyle*

*Faculty Mentors: Anna Tresidder*

Various links have been established between attributes of the neighborhood built environment and the likelihood of engaging in physical activity such as walking. To date, the overwhelming body of research on walkability has focused primarily on objective features of walkability (Bereitschaft, 2017). However, the relationship between objective features of the built environment and walkability do not always provide a clear picture. Often times macro scale studies that document features of the built environment like land use and density do not yield similar results as microscale studies which look at subjective features such as perceptions of safety, aesthetics, and resource quality (Cutts, Darby, Boone, et al., 2009). These factors have been shown to differ significantly between low and high income neighborhoods, even when controlling for objective features such as mixed land use and density (Neckerman, Lovasi, Davies, et al., 2009). Using Walk Score® as a proxy of objective walkability, this study seeks to document subjective experiences of walkability of individuals living in a low and high income neighborhood in Spokane, WA. Differences are discussed within a Social Ecological Framework where local gentrification is highlighted and the need for equity is considered.

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**Nutrient reduction to manage an invasive annual grass and impacts on the soil microbial community: Location: Senior Hall - Room 203**

*Speakers: Jared Lamm*

*Faculty Mentors: Justin Bastow*

Intact semi-arid grasslands are one of the most endangered ecosystems in the world, due to cultivation and invasive plant encroachment. *Ventenata dubia* (*V. dubia*) is an invasive winter annual grass that germinates in the Fall and begins growing in the spring while native plants are dormant. Early growth habits give *V. dubia* an advantage over later season native plants but makes it vulnerable to early season management methods like herbicide application. Managing *V. dubia* with herbicide is variably, often negligibly, successful at reducing *V. dubia* and is also harmful to the soil microbial community. A healthy soil microbial community is beneficial for meeting restoration and management goals. An alternative method of managing *V. dubia* is reducing available nitrogen by applying a carbon source to the soil, like sucrose. Added carbon stimulates microbes to acquire soil nitrogen and immobilize it in their cells where plants cannot use it. Sucrose can be easily assimilated and consumed by microbes, meaning if used as a carbon source to stimulate microbes the impact will be short-term. \_x000D\_

By applying small amounts of sucrose early in the season I attempted to reduce nitrogen early in the year, when *V. dubia* was active, but have nutrients become available later when native plants were no longer dormant. Three low levels of sucrose, compared to previous research, of 50, 100, and 250 g, were applied to 1 m<sup>2</sup> plots in a semi-arid grassland in late March of 2018. Sucrose treatments reduced *V. dubia* cover by up to 20%, did not impact perennial plants, and caused a slight increase in native plant abundance. Treated plots had higher microbial abundance, slightly lower decomposer fungi, but did not appear to impact arbuscular mycorrhizal fungi, which are important for restoration success.

**Perception of Female Defendants as a Function of Pregnancy Status: Location: Senior Hall - Room 302***Speakers: Rachel Silverthorn**Faculty Mentors: Kayleen Islam-Zwart*

Given the impact pregnancy has in other areas of life, it makes sense that when a woman is brought into the criminal justice system pregnancy will play a role in how others perceive her. While research exists on the implications of pregnancy on incarceration, there is a gap regarding the trial phase and the effects of pregnancy on the adjudication process.

The purpose of this study was to determine whether pregnancy status impacts jury perception of female defendants. It was hypothesized that a pregnant defendant would evoke sympathy in a trial situation and consequently a pregnant woman would be judged less harshly by a juror than a non-pregnant woman when committing similar crimes.

Participants 375 undergraduate students from a regional university in the Pacific Northwest of the United States.

Participants signed up for the study through the University Research Site and completed the study online through Survey Monkey. Participants completed a general demographic survey as well as the Attitudes Towards Jury Service

Questionnaire (Decker, 1996), and the Marlow Crowne Social Desirability Scale, (MC-SD; Crowne & Marlow, 1960).

Additionally, they responded to six scenarios, created by the primary author, with women committing crimes of varying degrees of seriousness. Participants were asked to make decisions regarding guilt based on the scenario, with pregnancy status being manipulated. Perception of guilt and severity of sentence served as dependent variables.

Research regarding the role pregnancy plays in a trial the judicial system is important for understanding the potential biases present for women in the criminal justice system and ensuring a fair trial process. By understanding how pregnancy status can affect a juror's perception of women on trial, jurors can be chosen with these biases in mind. This can also be helpful in simply educating jurors and jury selection committees of the potential for these biases in the trial phase.

**The American Dream and a Rousseauian Democracy: Location: Senior Hall - Room 221***Speakers: Joseph Scott**Faculty Mentors: Majid Sharifi*

Before asserting an argument, this essay both develops an understanding of a more Rousseauian democracy and its relation to the foundation of America, as well as outlines the evolution of the American dream into one which supports a more neoliberal vision. Once there is a comprehension of the significant qualities of each topic, the article begins to advance the argument that the contemporary American dream is unable to hold adequate viability with a Rousseauian democracy. The American dream has evolved into one that promotes individualism that is controlled by the centrality of economics. This defies the importance of submitting one's particular wills for that of a general will, which allows members of a society to gain a greater sense of moral and civil freedom. According to The Social Contract, without a focus on the pursuit of general will, the American society would only worsen. While they may not be completely bound by the desires of their appetite, as suggested by Rousseau, they do (with the development of neoliberal ideals) become gradually more enslaved by the increasing economic inequalities advanced by those with strong economic influence. The American dream can be seen as a sort of cloak that hides the negative effects of neoliberalism. Even with the evolution of the dream, polls show Americans have continually maintained a strong belief in its existence and achievability. Due to

this, there may be hope in its potential to evolve further into a dream that is more viable with a Rousseauian democracy. The question then becomes: how can enough Americans reach this understanding and help to discretely evolve an ambiguous dream before it is too late? The supporting evidence is largely based on documentation, but also utilizes statistics to identify public opinion and economic developments.

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**Therapeutic Recreation: Community Involvement: Location: Senior Hall - Room 243**

*Speakers: Amy Holt*

*Faculty Mentors: Emily Messina*

As of September 2017, 560,200 Veterans lived in the state of Washington. One of the leading challenges facing Veterans is re-integration back into their communities (Sayer, 2010). Team River Runner (TRR) is one program developed to address this challenge. Founded in 2004 at Walter Reed National Military Medical Center, Team River Runner offers weekly paddling sessions in more than 60 locations across the nation (<https://www.teamriverrunner.org/about-us/>). This winter, students from the EWU Therapeutic Recreation and Mechanical Engineering programs have found the ability to connect course content to real-world application and make an impact on these individuals' lives.     

The current partnership was established between Team River Runner, the EWU Therapeutic Recreation Academic Program, and EWU EPIC Adventures, to match interested veterans with student volunteers and access to the pool and equipment. From this, an interdisciplinary project began to evolve when the Mechanical Engineering program added a capstone project to design adapted kayaking equipment for the participants. Each organization and program has been able to bring specific design and usability expertise and ideas to collaborate in a problem-based project and develop a real-world solution that could potentially provide expanded recreational opportunities for individuals with physical disabilities. The interdisciplinary partnership has resulted in various prototypes of an adaptive rowing paddle. The end designs have had an initial level of evaluation and all partners continue to meet and build on this foundation. This session will demonstrate the teams' work.

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**English Literacy in a Colville-Okanagan Salish Immersion Classroom: Location: Senior Hall - Room 201**

*Speakers: Elicia Allen*

*Faculty Mentors: Kassahun Kebede*

The Salishan language family is comprised of 14 languages. The Southern-Interior group of the Salish family includes the Coeur d'Alene, Columbian, Colville-Okanagan, and Spokane-Kalispel languages and dialects. The most recent estimates from UNESCO state that each of these languages have less than 100 fluent speakers. This project examines the English literacy skills which are developed in a Colville-Okanagan Salish immersion classroom. The data analyzed is drawn from reading test scores from different schools in the Spokane metropolitan area. These tests are the Fountas & Pinnell benchmark assessments and the NWEA MAP Growth. In the first leg of my research, the percentage of students reading at or above grade level was the responding variable which was used to measure the level of English language literacy skills in elementary aged students. In the second leg of my research, the number of students who met the standards of the MAP Growth test was the responding variable used to measure the level of English language literacy skills. The results of

this research project substantiate prior research on the effects of learning a second language on English literacy, as well as reframe Salish as a living, dynamic, and observable language of instruction.

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**Evaluation of the real-time monitoring of electroporation applications using clinical potential of Electroacoustic Tomography (EAT): Location: Senior Hall - Room 204**

*Speakers: Timothy LaPlante*

*Faculty Mentors: Ali Zarafshani*

Electroacoustic tomography (EAT) is a new imaging technique of real-time or (in situ measurement) imaging that is under development for applications in electroporations. Electroporation is a microbiology technique in which a high voltage (kV/cm), ultra-short pulse (us-ns) electric field is applied to create nano-scale pores in cell membranes to deliver drugs or genes inside the cell for potential treatment of several diseases. There are two types of electroporations, reversible and irreversible. The later method creates permanent pores in the cells and ultimately causes cell ablation. While the former only temporarily creates pores that allow for the absorption of chemicals or genes that would otherwise not be able to penetrate the cells membrane. Applications of both methods using pulsed electric fields are being tested as treatments for certain types of cancer with promising results. \_x000D\_

Early testing of the EAT technique has taken place and has proven the fundamental process of acoustic detection is possible from an electric field inside a medium. This experiment aims to improve on the understanding of the EAT technique by expanding the scope of the procedure by including testing of phantom, which is a homogeneous conductive gel that replicates human tissue characteristics. This experiment also attempts to improve the resolution and reduce the SNR (signal-to-noise ratio) of the induced acoustic signals. Testing is done using a MOSFET based pulsed electric field generator for applying high-voltage, short-burst (us-ns) electric pulses to two electrodes in the phantom. An ultrasound transducer is placed in the substance as well to detect the acoustic signals. The signal is then being amplified through a high frequency amplifier and process using the DAQ along with the appropriate hardware and software to improve the resolution and noise to signal ratio.

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**Ghosting as a Dissolution Tactic in Romantic Relationships: Location: Senior Hall - Room 101**

*Speakers: Lily Ann Long, Rachel Pinkerton, Theresa Lee*

*Faculty Mentors: Theresa Martin*

Ghosting, the act of withdrawing from all contact with someone without explanation, is a growing phenomena as the prevalence of technologically-mediated communication increases. In this research, ghosting is studied as a dissolution tactic in romantic relationships using a survey aimed to measure thoughts about people and interactions and the personal view of self as well as tactics used during the breakup, motivation, partner compatibility, and the after effects of ghosting on emotionality. Even though the existing body of ghosting literature is slim given the novelty of technologically-mediated romantic interactions, this study aims to add to the current research by exploring the prevalence of ghosting dissolution tactic associated with different demographic factors such as age, gender, and relationship status, personality, and attachment style.

**Hyperlocal Journalism & Business Models: Location: Senior Hall - Room 304**

*Speakers: Samantha Jackson*

*Faculty Mentors: Jamie Neely*

As print journalism battles trust issues within the U.S., online hyperlocal publications work to combat those problems by narrowing-in on readership but can struggle to stay financially viable.

Hyperlocal journalism focuses on communities, granting news that is specific to that audience.

This research will highlight an interview done with Tracy Record, Editor and Publisher of The West Seattle Blog, a successful hyperlocal news site, regarding its business model and how it manages to remain a news outlet.

Additionally, the research includes a look at My Ballard, another successful hyperlocal website that is for North Seattle.

The project will also spotlight hyperlocal social media applications such as Nextdoor and Google Bulletin, which feature a hyperlocal model on a national scale.

The project will look at a non-profit organization, LION Publishers, which helps local news outlets implement hyperlocal news strategies, pools resources and promotes collaboration between its members.

The goal of this research is to show how hyperlocal journalism can be a successful and viable business model for journalists.

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**Marguerite Higgins: Bringing War to the Masses: Location: Senior Hall - Room 306**

*Speakers: Kelli Knerr*

*Faculty Mentors: Bill Youngs*

A biographical look at Marguerite Higgins' life.

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**Physical activity, stress, and sedentary behavior in graduate students: The PASS study: Location: Senior Hall - Room 243**

*Speakers: Emily Dunston*

*Faculty Mentors: Katie Taylor*

Physical activity (PA) has many health benefits, yet more than half of university students do not currently meet PA guidelines. Although beneficial relationships between PA and stress have been shown in undergraduate students, little has been studied in graduate cohorts. PURPOSE: To determine if stress differs across levels of PA and sedentary behavior (SB) in graduate students. Further, we aimed to understand the associations among PA, SB and stress. METHODS: An online survey was distributed to graduate students (n=67; age 27.5±7.8 yrs). The survey included the International Physical Activity Questionnaire, Sedentary Behavior Questionnaire, Cohen's Perceived Stress Scale and demographic questions. One-way ANOVAs were used to determine differences in stress across tertiles of PA and SB. Pearson's correlations and multiple linear regressions were used to determine independent associations among variables. RESULTS: There were no significant differences in stress across tertiles of SB (p=0.67) or walking (p=0.69). However, there were significant differences in stress across tertiles of moderate-to-vigorous physical activity (MVPA; p=0.006). Further, time spent in vigorous PA was negatively associated with stress independent of age, sex, and hours worked per week ( $\beta=-0.365$ , p=0.006). Time spent in SB (p=0.559), walking (p=0.902), and moderate PA (p=0.074) were not significantly



associated with stress. CONCLUSIONS: Students meeting PA guidelines (i.e.,  $\geq 150$  min/week of moderate-to-vigorous PA) had significantly lower stress levels than those who were physically inactive. Additionally, vigorous PA was negatively associated with perceived stress independent of age, sex and hours worked per week. This suggests that PA may have a positive effect on stress levels; however, the intensity of PA may be important. Future research should use objective measures of PA in a longitudinal study to determine whether changes in PA and SB influence stress levels in graduate students.

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**Riparian Resilience in the Face of Interacting Disturbances: Wildfire, erosion and beaver (*Castor canadensis*) in grazed riparian systems of the western United States: Location: Senior Hall - Room 203**

*Speakers: Alexa Whipple*

*Faculty Mentors: Rebecca Brown*

Riparian systems of the dryland western United States provide critical ecosystem functions such as diverse habitat for numerous species, flood attenuation and essential water storage in water-limited environments. These systems have experienced long term disturbance from anthropogenic activities including the grazing of livestock in dryland riparian systems and near extirpation of a keystone riparian species, *Castor canadensis* (beaver). However, increasing frequency of large-scale wildfires and climate change driven weather is altering the severity and scale of riparian disturbance. Beaver restoration has been gaining use to address long term riparian disturbances, yet little is understood regarding the impact of restored beaver activity on recently burned riparian systems. The objective of this study is to determine the interactions between beaver populations, large scale wildfire and subsequent erosion events in grazed riparian systems of the Methow River watershed, north central Washington. A fully factorial study comparing vegetation, water quality and channel cross-sections of burned and not burned stream reaches, with beaver presence and without, was conducted in 2018. Our research indicates increased vegetation diversity and nutrient storage and greater connectivity between stream and floodplain in beaver occupied, burned riparian systems. By studying interacting variables of fire, stream channel erosion and beaver activity in grazed systems, more effective and holistic approaches to adaptive ecological and economic management will emerge. Results from this research will be used by public land managers to improve and restore riparian function and management after wildfire for ecological and economical resilience in dryland western ecosystems.

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**Social Exclusions: A Theoretical Link Between Neoliberal Rationality and School Shootings: Location: Senior Hall - Room 221**

*Speakers: Bryan Lockwald*

*Faculty Mentors: Thomas Hawley*

This paper will address a few of the social implications of neoliberalism, especially as being a driving force or ideology behind the political economy of the United States. As such, there will be discussion of an explanation of what neoliberalism is as an ideology. This paper will then discuss some of the implications on a social level of the privatization of risk both economically and socially to the individual. There are studies that show the effects of social exclusion, and that neoliberal ideology helps to create social exclusion in individuals because of the privatization of risk to the individual.

This will form a theoretical framework through which to view the rise in school shootings by adolescent males in U.S. society.

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**Stylistic Imitation as an English-Teaching Technique: Location: Senior Hall - Room 302**

*Speakers: Min Yi Liang*

*Faculty Mentors: LaVona Reeves*

Stanley Fish argued that “students can’t write clean English sentences because they are not being taught what sentences are” (Stodola 57) or what “good” paragraphs look like. The O.E.D. defines style as “[t]he manner of expression characteristic of a particular writer... a writer’s mode of expression considered in regard to cleanness, effectiveness, beauty, and the like” (cited in Stodola 58). Noguchi further defines style as “[a]n author’s choice and arrangement of words, sentence structures, and ideas as well as less definable characteristics such as rhythm and euphony” (59). This qualitative study of pre-service teachers’ responses to training and practice explores the use of guided writing to teach Western style composition and examines the use of stylistic imitation, a form of guided writing as an English-teaching technique. Stylistic imitation is not new as a technique; it was one of common practices in Greco-Roman world by Plato, Aristotle, Cicero, Isocrates, Quintilian, and other Classical scholars. The present study involves an analysis of seventeen undergraduate students’ journals and short essays that they wrote in an English class, Grammar for Teachers. Considering students’ written work and comments on stylistic imitation, the author focuses on the use of stylistic imitation as an English-teaching technique to English language learners (ELLs) who lack knowledge of and practice in the American patterns of writing. Multilingual writers from different countries have unique writing patterns in their cultures which will influence writing in a second language, as what Robert Kaplan emphasized and developed the term contrastive rhetoric. The author will talk about the different views of stylistic imitation in composition and introduce some methods which can help ELLs to understand the American writing patterns and succeed in college composition.

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**Audience retention for news style podcasting: Location: Senior Hall - Room 304**

*Speakers: Taylor Newquist*

*Faculty Mentors: Jamie Neely*

As the life of the newspaper industry dwindles, podcasts garnering information straight from a source or compiling a tailored selection of the day’s headlines have taken center stage in modern journalism. Producers of these podcasts build their audience through focusing on specific topics or presenting styles that effectively connect with people and retain their attention over days, months or years. The aim of this study is to show what stylistic variance in a podcast retains the largest audience and how other journalists can best produce a podcast themselves. This study looks at a range of the top news podcasts to identify trends, and incorporates theory to understand why podcasts are a growing industry. The findings of this research were incorporated into works done by The Easterner over the course of the winter and spring quarters. The use of the human voice to tell stories builds trust and relationships with the audience. Consistency and frequency of releasing podcasts is the best way to retain that relationship with the listener.

**Borderlands Theory: Connections in Identity Development Between Latinx and Multiracial Communities: Location: Senior Hall - Room 201**

*Speakers: Kim Jones*

*Faculty Mentors: Kassahun Kebede*

How is identity determined? In Gloria Anzaldúa's book, *Borderlands/La Frontera*, she describes the intricate nature of identity development for Latinx people. The chaos introduced in the Borderlands Theory can be seen through the conflicts that many Latinx people experience. Latinx individuals have a very unique and contentious relationship with the United States. Now, to those in living in the U.S., they aren't American enough to be in America, but to people in Latinx countries they aren't Latinx enough to be Latinx. Tying this to the multiracial community, the same notion of unbelonging is felt by them as well. For multiracial ethnic identity, the experiences are unique to every individual, changing depending on that person and their journey through life. The same uniqueness can be felt through Latinx individuals in the way that they too experience that uncertainty of not belonging in the place that they want to call home. This research dives into the connections between multiracial individuals and those that identify as Latinx. It asks the questions of "who or what has influence over how one identifies?" and why?

**David and Goliath: The Abdication of a Throne: Location: Senior Hall - Room 306**

*Speakers: Shawn Dufrene*

*Faculty Mentors: Ann Le Bar*

The year 1936 would come to be known as the Year of the Three Kings. King George V died as the night was falling to a close on January 20. His oldest son, known as David in the family, became Edward VIII, and would abdicate before the year was out. During those 326 days, it would become apparent to those around him that he was not fit for the throne. His desire to marry Wallis Simpson would be the final straw. His younger brother, Albert, or "Bertie," became George VI, and Edward became known as the Duke of Windsor. Through declassified FBI reports, years later, it was discovered that Windsor had Nazi ties, and was seen by Nazi leadership as a potential King-in-Waiting for the peace movement. This paper will argue that if King Edward VIII had had his way and stayed King of the United Kingdom, instead of his brother, World War II would have been drastically different.

**Eating Relationships: Victorian appetites in *Trilby* and *Dracula*: Location: Senior Hall - Room 302**

*Speakers: Rose Hall*

*Faculty Mentors: Beth Torgerson*

My paper will explore how Victorian men and women use heterosexual romantic relationships as a food source and each other as food. It explores various characters' perceptions and practices of romantic relationships in George Du Maurier's *Trilby* and Bram Stoker's *Dracula*. The scholarship on these novels has been understandably concerned with discrimination of various forms (gender, racial, religious). This paper recognizes and builds off previous work, but the argument strives to expose how these social systems have created a strange food-centric relationship dynamic between romantic partners in the Victorian era. It suggests Victorians' relationships with food and their food behaviors can be used to read the characters and their relationships with each other. I examine the female characters *Trilby* O'Ferrall, Lucy

Westenra, Mina Harker and the male characters Little Billee, Dracula, and Svengali in detail. In these novels, people eat each other figuratively and literally. By eat, I mean they absorb what their romantic partners have to offer (i.e. beauty, warmth, support, strength, blood, money) and use those things for survival or physical satisfaction. Lucy, Mina, and Trilby feed on their romantic relationships because they need them to survive, but Little Billee, Svengali, and Dracula feed on relationships to feel good. These characters eat to survive but also for pleasure.

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**Friends With Benefits Relationships Versus Intimate Relationships and their Relationship Satisfaction:  
Location: Senior Hall - Room 101**

*Speakers: Nicole Schmidt*

*Faculty Mentors: Theresa Martin*

The purpose of this study was to identify if there was a relationship between friends with benefits relationships and intimate relationships and their relationship satisfaction within the relationships. A total of xx participants completed the surveys were completed a web service that was accessed through Facebook and sona systems. In addition to demographic questions, participants were asked to fill out a survey (Owen, Ficham) that assess the aftermath of friends with benefits relationships and the long term effect they have on the partners involved. There are also locally developed questions about the conclusion of the friends with benefits relationship and the current state of the partners friendship. Furthermore, the survey focused on the communication between the partners throughout and after the relationship.

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**Populism: An Exploration of Ideological Polarization and the Motivational Nature of Resentment:  
Location: Senior Hall - Room 221**

*Speakers: Justin Harmon*

*Faculty Mentors: Majid Sharifi*

Populism is not a new phenomena in the United States and Europe. However, in recent times, it has become a common feature of political discourse. For instance, Southern Europe left-wing populist parties have had tremendous success since the 2008 financial crisis. In the rest of Europe, right-wing populist parties and movements are on the rise. The United States has also seen an increase in populist rhetoric on both sides of the isle. This paper explores the dynamics behind the polarized ideologies of these new populist movements and the emotional mechanism of resentment, which is the mobilizing force behind both the left and right-wing variants of populism. This will be done by exploring definitions of populism, the components of populist rhetoric, and globalization theory in combination with an examination of the motivational nature of resentment. Based on this information, populism can be best be understood as a set of means through which a political ideology can be expressed to provoke a reactionary response among the electorate.

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**Riparian Resilience in the Face of Interacting Disturbances: Wildfire, erosion and beaver (*Castor canadensis*) in grazed riparian systems of the western United States: Location: Senior Hall - Room 203**

*Speakers: Alexa Whipple*

*Faculty Mentors: Rebecca Brown, Margaret O'Connell*

Riparian systems of the dryland western United States (US) provide critical ecosystem functions and services such as diverse habitat for numerous species, flood attenuation and essential water storage in water limited environments. These systems have experienced long term disturbance from anthropogenic activities including the grazing of livestock in dryland riparian systems and near extirpation of a keystone riparian species, *Castor canadensis* (beaver). However, increasing frequency of large-scale wildfires and climate change driven weather is altering the severity and scale of riparian disturbance. Beaver restoration has been gaining use to address long term riparian disturbances, yet little is understood regarding the impact of restored beaver activity on recently burned riparian systems. The objective of this study is to determine the interactions between beaver populations, large scale wildfire and subsequent erosion events in grazed riparian systems of the Methow River watershed, north central Washington (WA), US. A fully factorial study comparing vegetation, water quality, stream channel substrate and channel cross-sections of burned and not burned stream reaches, with beaver presence and without, was conducted June through Nov of 2018 in the Methow River watershed. Our research indicates increased vegetation diversity, attenuated stream temperatures, increased nutrient storage and increased connectivity between stream and floodplain in beaver occupied, burned riparian systems compared to burned systems without beaver in sub-basins of similar area and hydrologic characteristics. By studying the interacting variables of fire, vegetation, stream channel erosion and beaver activity in grazed systems, more effective and holistic approaches to adaptive ecological and economic management will emerge.

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**The Effect of Blood Flow Restriction on Muscle Hypertrophy and Strength: An Experimental Study:  
Location: Senior Hall - Room 243**

*Speakers: Kristin Freitas, Harli Spurgeon, Shawn Semb*

*Faculty Mentors: John Gerber*

Blood Flow Restriction (BFR) Therapy, is a rehabilitation strategy that uses a surgical grade tourniquet placed on limbs during an exercise circuit to prevent venous return while maintaining arterial flow. This creates a hypoxic environment that promotes strength and muscle growth, due to muscle swelling and increased metabolites stimulating muscle growth (Loenneke J. 2012). “When low intensity exercise is combined with blood flow restriction, significant increases are found with both strength and muscle hypertrophy in comparison to traditional weight training”(Krieger, 2010). BFR can use restriction of blood flow to a muscle to simulate heavy resistance training in order to improve muscular strength and hypertrophy for post-surgical patients with muscular deficits. If regaining muscular strength and size is accelerated, it can potentially increase the rate of return to activity. To better understand the effects of BFR on muscular strength and hypertrophy, we will study the effects of BFR on college students 18-31 years old. Students will participate in a four week study. Immediately before, a baseline assessment of 1RM bicep curl will be conducted. Following, twice a week BFR protocol will be completed on their bicep brachii. The same protocol without BFR will be conducted on the opposite arm, utilized as a control. Following the four weeks, a repeated 1RM and measurements of both arms will be completed to determine the effects of BFR. For the study results, participants showed a consistent increase in muscle size, compared to the baseline measurements. Muscle strength, however did not have a significant increase between the before and after

1RM of each participant. Thus, the resulting muscle size increase indicates the benefits of BFR treatment for post surgical-patients in combating muscle atrophy.

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**White Nose Syndrome infection and Microbiome Diversity of *Myotis lucifugus* with Ectoparasites in Eastern Washington: Location: Senior Hall - Room 204**

*Speakers: Jamie Olson, Aaron Hope, Connor Abney*

*Faculty Mentors: Krisztian Magori*

White Nose Syndrome (WNS) is a fatal disease in *Myotis lucifugus* caused by the *Pseudogymnoascus destructans* fungus that is spreading across North America. The known transmission vectors of the disease are bat to bat contact and contact with habitat walls. Ectoparasites such as bat fleas, chiggers, and mites are also suspected to serve as transmission vectors as well. Across multiple kingdoms of life, a diverse microbiome has been correlated to a reduced susceptibility to fungal infections, and an overall increase in fitness.

We hypothesize that the microbiome diversity of *M. lucifugus* is reduced in the presence of an ectoparasitic inhabitation, resulting in a higher susceptibility to *P. destructans*.

EWU students have assisted WADFW in collection and inspection of bats for 2 years, and has recorded the phenotypic measurements of the bats, along with the presence of ectoparasites. No cases of WNS have been noted in the Inland Northwest to date. Prior samples of ectoparasites are preserved at EWU, which we will visually identify. During the collection, we will swab bats with and without ectoparasites, to assess their full microbiome with a 16s RNA assay sourced to Harvard. We will also collect the ectoparasites from the inhabited bats to assess their density by species. Combined with previous data, we will be able to assess phenotypic differences between inhabited and uninhabited bats as an indicator of fitness. Within our data, we will also be able to assess any potential link between microbiome diversity and overall fitness as defined by phenotypic differences within the population.

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**Living Life the Wiccan Way: An ethnographic narrative: Location: Senior Hall - Room 201**

*Speakers: Terrie Cramer*

*Faculty Mentors: Kassahun Kebede*

Wicca's rise in popularity around the world has made it more comfortable for more people to discuss being Wiccan or identify as Pagans. The number of self-identified witches in America has increased in recent years to 1.5 million. However, since there is no one text for Wicca, the core tenets are a compilation of stories handed down from generations of Druids, Pagans, and Shamans. Because of these reasons, misconceptions about Wicca are very insidious. Many Wiccan symbols, such as the Pentacle, have long been associated with worshiping the Devil. The general public misunderstandings coupled with the media's negative depiction of Wicca symbols, rituals, and festivals continue to overwhelm the essence of the religion. Briefly, Wicca is a neo-Pagan, nature-based religion, which roots, are based upon pre-Christian traditions originating in Scotland and Ireland. In Wicca, there is a constant acknowledgment about connectedness with nature, and a desire to live in harmony with it. Regardless of gender, to be a witch is to be a healer, a teacher, a seeker of knowledge, and a protector of life. In this presentation, I discuss my generational experiences as a Wiccan. The paper is part of multi-year-long autobiographical research. The paper not only sheds some perspectives on

what it means to be Wiccan but it also discuss the difference between Wicca and witchcraft. Being Wiccan, and being raised by a Wiccan grandmother, I believe my ethnographic narrative would dispel some of the misinterpretations and show the origins, meanings and healing powers of Wiccan symbols and festivals

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**Revising Health Misconceptions: Location: Senior Hall - Room 101**

*Speakers: James Rheams*

*Faculty Mentors: Danielle Sitzman*

Prior knowledge can influence memory in a myriad of ways. Some research has demonstrated that both younger and older adults are more likely to correct errors in memory if they have higher levels of domain knowledge compared with lower levels of knowledge. In contrast, other research suggests that inaccurate prior knowledge can interfere with the ability to learn new correct information. For example, retractions of misconceptions (e.g., vaccines and autism) may lead people to strengthen their initially held incorrect belief. These backfire effects make it unlikely that a person will update their memory to accommodate correct information. Research on older adults has found that they may be unable to update their inaccurate knowledge about medical information (e.g., misconceptions about arthritis) despite detailed information refuting these misconceptions. One way to potentially understand when prior knowledge will help or hinder the learning of new information may be to examine the degree to which participants believe the feedback they are provided. Previous research with younger adults suggests that they are more likely to revise science misconceptions when they have high levels of belief in the feedback they are provided, and less likely to revise misconceptions when they do not believe the feedback is accurate. The current research aims to examine how belief in the information provided through feedback influences the likelihood of revising health related misconceptions in older and younger adults. In the first phase of the experiment, younger adults answered a series of true/false health related questions and rated their confidence in their response. Participants were then provided feedback in the form of explanations for the correct response and rated their belief in the accuracy of the explanations. One week later, they completed the same true/false test. We will explore the relationship between belief in the explanation of the correct response and the likelihood.

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**Spinoza: The Modern Stoic: Location: Senior Hall - Room 306**

*Speakers: April Wright*

*Faculty Mentors: Kevin Decker*

Spinoza's philosophical work, *Ethics*, is deeply indebted to the Stoics. While common surface features in both philosophies are evident, I argue that a deeper reading of Stoic philosophy as well as the *Ethics* reveals "Spinozism" as a modern perspective on metaphysical and ethical positions held by the Stoics since Zeno, lending support to the notion that Spinoza may be read as a Stoic. The *Ethics* holds important implications for the evolution of Stoic philosophy and highlights weaknesses Spinoza may have seen in the approaches of the Hellenistic and Roman Stoics that I argue he sought to improve upon while maintaining and expressing Stoicism-congruent goals and values in the pursuit of living a life in accord with Nature.

**The Affect of Concussions on Mental Health in Division I Collegiate Athletes: Location: Senior Hall - Room 243**

*Speakers: Isabella Quaratiello, Mckenna Patrick, Eli Strom*

*Faculty Mentors: John Gerber*

A sport-related concussion is a traumatic head/brain injury sustained by athletes and physically active individuals. Mental health is a level of psychological well-being or an absence of mental illness. This research aims to investigate the link - or lack thereof, between post-concussion division I student athletes age 18 to 25 and their mental health. An anonymous survey is used to rank stress levels of student athletes. It includes questions such as but not limited to, “perceived daily stress on a scale of 1-10”, “diagnosed mental health disorders”, “number of documented concussions”, and “number of credits currently enrolled in”. An overview of these findings, examples of outcome measures, and specific recommendations for clinical practice have been discussed.

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**Using Social Media Effectively: Location: Senior Hall - Room 304**

*Speakers: Lauren Dierkop*

*Faculty Mentors: Jamie Neely*

In a society heavily reliant on social media, the way people communicate has completely changed. Bloggers, vloggers, and social media “influencers” have a special role in guiding the way a majority of people view ideas and opinions. Vlogging, blogging, and using social media intentionally is critical from a journalistic perspective, as it allows consumers and the public to see a transparent version of the person promoting said ideas and opinions.

In my research, I discovered that 95 percent of people 13 and older have a smartphone or easy access to one. The average person is so “plugged in” to social media platforms that it is impossible to ignore their presence and attention from a marketing and journalistic level.

This research uses multiple scholarly articles, statistics on the demographics of social media users, a dissertation, and an interview with a successful travel journalist as well as an interview with an Instagram “influencer” to evaluate methods that can be used to build and engage audiences with more organic interactions on social media.

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**Who Inspired Whom: Jack the Ripper and Robert Louis Stevenson: Location: Senior Hall - Room 302**

*Speakers: Ashley Hansen*

*Faculty Mentors: Beth Torgerson*

The Strange Case of Dr Jekyll and Mr Hyde is one of Robert Louis Stevenson’s best works of fiction. Written in the Victorian period, the idea of nature without God is prevalent throughout this story. Taking a step back, though, we may be able to determine just who inspired this story (and who this story, in turn, may have inspired) through real people and occurrences, which only stand to make Stevenson’s story that much more amazing. The notion that his characters were influenced by people in his life and society make the ideals of the Victorian era come full circle in this chilling, suspenseful tale.



**Detection of Rickettsia spp. in ticks at Turnbull National Wildlife Refuge, WA: Location: Senior Hall - Room 203***Speakers: Justin Donahue**Faculty Mentors: Krisztian Magori, Margaret O'Connell*

The tick species *Dermacentor andersoni* and *Dermacentor variabilis* are known vectors of pathogens. These pathogens include the spotted fever group rickettsiosis (SFGR), caused by closely related bacteria species of the *Rickettsia* genus. The most fatal SFGR is Rocky Mountain spotted fever, whose etiological agent is *Rickettsia rickettsii*. In 2014 and 2016 *Dermacentor* ticks were collected from Turnbull National Wildlife Refuge (TNWR), WA. To identify *Rickettsia* pathogens, polymerase chain reaction (PCR) was used to amplify fragments of the 17-kDa antigen gene. In 2014, 23 of 122 (18.9%) were positive for *Rickettsia* spp. and 3 of 122 (2.5%) for *R. rickettsii*. In 2016, 33 of 472 (7.0%) were positive for *Rickettsia* spp. and 4 of 472 (0.8%) for *R. rickettsii*. To further evaluate the distribution and threat of *R. rickettsii*, ticks were collected from 27, 50m transects across the public use area of TNWR in spring 2018. In total, 452 *Dermacentor* ticks were collected over 16 weeks and tested for *Rickettsia* spp. by using PCR to amplify the same 17-kDa antigen gene fragment. Those that were putatively infected with *R. rickettsii*, were further assessed by amplifying the citrate synthase (*gltA*) gene fragment, as well as the SFGR-specific 190-kDa antigen (*rOmpA*) gene fragment. All gene fragments are commonly used to test for *Rickettsia rickettsii*. Sequencing of the 17-kDa antigen showed 21 of 452 (4.6%) positive for *Rickettsia* spp. and 6 of 452 (1.3%) for *R. rickettsii*. Further sequencing of the *gltA* and *rOmpA* genes was inconclusive. Both gene fragments (*gltA* and *rOmpA*) were in correspondence and positive for *Rickettsia peacockii*, a non-pathogenic *Rickettsia* spp. that may also block the infection of *R. rickettsii* in ticks. While our results are inconclusive, they suggest that *Rickettsia rickettsii* is not present at TNWR, as was previously thought.

**Benefits of open source as a new journalism model: Location: Senior Hall - Room 304***Speakers: Erik Rotness**Faculty Mentors: Jamie Neely*

As the number of online publishers grows and both newsrooms and deadlines shrink, publications in today's age are embracing coding tools to find facts and leads while engaging audiences off the paper. To increase access to these tools, journalists are embracing open source. The purpose of this research is to determine the benefits of open source coding for today's journalists. This study includes an interview with Ryan Pitts, the program lead for technology at OpenNews, a paper on open source as a culture for the Journalism Studies Division of the International Communication Association, an article from NiemanLab on DocumentCloud: an open source tool that helps journalists find and make use of primary source documents, a study on data-driven journalism and the public good from researchers at the University of Paris-Est Marne-la-Vallée and Paris Descartes University, and a field guide to open-source in the newsroom, which was funded by the Knight Center.

This research shows that open source coding in journalism can help newsrooms innovate through collaboration and gain access to tools and methods for improved reporting, and that open source culture holds potential innovations in the way we approach journalism.

**Composite Materials Analysis: Location: Senior Hall - Room 306**

*Speakers: Heidi Plough, Joe Wagoner*

*Faculty Mentors: Awlad Hossain*

Structural weight reduction with improved functionality is one of the targeted desires of engineers, which drives materials and structures to be lighter, but without compromising critical properties such as strength and elasticity. One way to achieve this objective is through the replacement of metallic structures with composites. In brief, composites are a combination of two or more distinct materials to form a new material with enhanced properties. Two of the most common composite materials used in industries are carbon fiber reinforced polymers (CFRP) and glass fiber reinforced polymers (GFRP). Students enrolled in Composite Materials (MENG 455) class conduct a series of laboratory experiments, besides regular class lectures, to understand how the mechanical properties of these polymer matrix composites depend on various parameters including type of fiber and matrix, ply orientation, ply stacking sequence, number of plies, and others. The learning process starts with theoretical knowledge of composites and its constituents, manufacturing process, micromechanics, ply mechanics, macromechanics and strength. Students conduct various laboratory experiments, which are correlated to class lectures, to enhance conceptual understanding. This research presentation will outline the details of several learning objectives from the lecture and laboratory experiments of Composite Materials class.

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**How Do Fine Sediments and Hangman Creek Discharge Affect Benthic Macroinvertebrates in the Spokane River?: Location: Senior Hall - Room 203**

*Speakers: Anwar Bushnaq*

*Faculty Mentors: Camille McNeely*

One of the most common causes of stream degradation globally is fine sediment deposition. Most fine sediments deposition in stream beds is generated by certain land use practices such as timber harvest, agricultural production, and urbanization. Hangman Creek is a major tributary and source of fine sediment to the Spokane River. Benthic invertebrates are effective indicators of the ecological condition of rivers, including those that are adversely affected by the accumulation of fine sediments. Also, benthic macroinvertebrates play a crucial function in food webs as are an important source of food for many stream predators, including fish. The objective of this study is to investigate the effects of fine sediments on Spokane River macroinvertebrates. We sampled macroinvertebrate communities from 3 substrate types with different levels of fine sediment (sand, 0 - 25% embedded cobbles, and 75-100 % embedded cobbles) in the Spokane River upstream and downstream of its confluence and in Hangman Creek. Water temperature, flow velocity, and depth were also measured. Hangman Creek tended to be warmer and shallower than the Spokane River. The three most common invertebrates in the Spokane River were Chironomidae, Baetis, and Hydropsyche. To determine the effects of sediment and Hangman Creek discharge on macroinvertebrate metrics I performed two-way ANOVAs with site and substrate type as independent variables. In early summer 2018, the substrates significantly affected the density of macroinvertebrates; family richness for Ephemeroptera, Plecoptera, and Trichoptera (EPT); proportion EPT; proportion Clinger functional group; and the proportion of the dominant taxon. Family richness for all taxa and Shannon-Weaver diversity was not affected. This work will contribute to our understanding of the biotic effects of these sediments.

**Lactobacillus acidophilus as a Probiotic for use against Inflammatory Bowel Disease: Location: Senior Hall - Room 204**

*Speakers: Lindsey Gieser, Hailey Gieser, Chandler Hodge, Hayden Jones, Christina Hill, Ryan Cao*  
*Faculty Mentors: Krisztian Magori*

Inflammatory bowel disease (IBD) affects nearly 1.4 million people in the United States alone as of 2004. IBD is a category of diseases characterized by chronic and frequently relapsing diseases with bloody diarrhea, abdominal cramps, and pain that can lead to hospitalization and potentially surgery. The disease is characterized by an imbalance of the normal gut microbial flora including an increase in select organisms and a decrease in complexity of the commensal bacteria. Dextran sodium sulfate (DSS) is widely used for inducing epithelial damage, because of its rapidity, simplicity, reproducibility, and controllability. DSS is believed to have a barrier dysfunctioning mechanism that allows for bacteria to have easier entry into the host. The most promising probiotic seen so far are different species of *Lactobacillus*.

The purpose of this project is to determine if *L. acidophilus* can be used as a probiotic to reduce weight loss associated with inflammatory bowel disease in mice. Our hypothesis is that the mice that receive the *L. acidophilus* supplement will lose less weight than the mice who do not receive the *L. acidophilus* supplement due to the probiotic minimizing the effects of weight loss due to inflammatory bowel disease. Group two will be given 10<sup>9</sup> CFU7 of *L. acidophilus* orally daily for five days before being given dextran sodium sulfate salt (DSS) in the water which will induce IBD. Groups two and three will be induced with IBD using 3% of DSS in the water bottles. We will take weights of all the mice every day for two weeks to track their progression. At the end of the week, if any of the mice have lost 20% of their initial weight they will be euthanized. They will be euthanized by an overdose of CO<sub>2</sub> and then their cervical vertebrae will be severed. We will look at the trend for weight loss between the three groups to see if *L. acidophilus* had any effect on reducing weight loss. We hope that by doing this project, we will be able to understand the effects of probiotics on IBD in order to reduce the symptoms.

**Modernization of the USSR within the scope of hydro-power and anti-western ideas: Location: Senior Hall - Room 221**

*Speakers: Wendolyn Martinez*  
*Faculty Mentors: Dorothy Zeisler-Vralsted*

The Russian Federation and the United States have been notorious for their often-complicated political relationship throughout the years. During the rise of the Soviet Union the world witness their rush for modernization in infrastructure, economy, and society. The goal of this project is to identify the relationship between the creation of hydro- project infrastructure in the USSR and anti-west ideas relative to the United States and Western Europe. The report will also look into these events under the lens of modernization theory. This paper also identifies the separate reasoning for modernization and the current day effects of theses projects. Projects which will be reviewed are the Moscow-Volga Cannel in Moscow, Russia. Through the analysis of Soviet Era propaganda, government documents, and literature study consisting of scholarly journals and books, the relationship between modernization and anti-western ideas can be identified.

**Using Music to Enhance Story in Video Games: Location: Senior Hall - Room 302**

*Speakers: Nathan Sumerlin*

*Faculty Mentors: Jonathan Middleton*

This presentation shows an analysis of multiple musical pieces from the popular video game “World of Warcraft” and how it is used to complement and improve upon the storytelling it contains. The presentation will consist of a basic thematic analysis of three different pieces; “Stormwind Theme”, “Kingdoms Will Burn”, “Anduin’s Theme” from multiple points in the game’s long history as well as multiple short plot points related to the music we will be discussing. There will be a description of both how the theme appears in the game, as well as the order that the pieces were written by composer, Neal Acree. I will extract moments from each piece and show how they reference each other, but are not quite the exact same as heard in the other two pieces. Along with showing how they relate to one another, I will also demonstrate how they are used in the context of the greater story progressing around the music. There will be examples in demonstrations of cutscenes from within the game that are used to show how the music is particularly effective at enhancing the user experience in and around the story that is being played out. There will be quotes from Neal Acree from an email interview.

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**Why LinkedIn is an effective means for your job search: Location: Senior Hall - Room 201**

*Speakers: Stephanie Fleisher*

*Faculty Mentors: Galina Sinekopova*

The purpose of this presentation is for the audience to gain an understanding of what LinkedIn is, what it does, and its value as an effective tool for a job search. This presentation attempts to analyze the historic background of LinkedIn, content analysis of LinkedIn entries combined with personal success stories of job search. Several implications and directions for future research are also discussed.

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**“Barriers, awareness, and beliefs for reducing single-use plastic consumption among college students.”:  
Location: Senior Hall - Room 243**

*Speakers: McKayla Elliott, Sarah Olson*

*Faculty Mentors: Sarah Mount*

**BACKGROUND:** Scientists estimate that there are over 5 trillion particles of trash weighing over 250,000 tons currently floating in our oceans. This aquatic trash, or marine debris, is solid waste that is dumped into waterways through oceans, streams, rivers, and storm drains. A specific concern is the use of plastic bags, of which 500 billion are produced worldwide each year and at least 100 billion are used in the United States. If marine debris is not addressed soon the health of the economy, wildlife and people around the globe will continue to be devastated. While Spokane, WA is nearly 300 miles away from the ocean, the impact of residents’ improperly disposed of trash can be great. On average over 250,000 pounds of litter are picked up in Spokane each year. **PURPOSE:** This cross-sectional study identified awareness, attitudes, perceived barriers, and frequency of plastic bag use among students at Eastern Washington University. By identifying barriers, awareness, beliefs and increasing the amount of reusable bags available on campus, these researchers believe that the university could reduce plastic bag waste. **METHODS:** A convenience non-probability survey was posted

around high trafficked campus areas via posters with QR codes of the survey. Survey links were sent to various email lists to reach students. A descriptive analysis was used to analyze data.

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**A Preliminary Study of Farmworker Health in the Yakima Valley: Location: Senior Hall - Room 101**

*Speakers: Maria Rivera Diaz*

*Faculty Mentors: Martin Meraz-Garcia*

Based on estimates from the 2013-2014 National Agricultural Workers Survey, there are approximately 3 million farmworkers in the United States, and the average income ranges from 15,000-17,499 per year. Agricultural workers continuously are disregarded and forgotten although they are the backbone of the nation's agricultural industry. Considering the economic contributions that agricultural workers make to the U.S. economy, their restricted access to health care and education is unjust and immoral. This study will use data collected at a private clinic in Eastern Washington to evaluate the health care access provided to farm workers by their employers. The study will rely on empirical data collected from 20 participants and the Culture Care Theory as a theoretical framework. Our study addresses barriers encountered by immigrant farm workers in accessing health care including medical facilities that serve undocumented populations, health insurance coverage if any, the out of pocket cost of covering medical expenses as well as the factors that make this population vulnerable because they lack medical coverage.

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**Influence of soil moisture on the establishment phase for the perennial forb Arrowleaf balsamroot (*Balsamorhiza sagittata*): Location: Senior Hall - Room 203**

*Speakers: Sarah Hill*

*Faculty Mentors: Robin O'Quinn*

With less than 1% of its historic range remaining, the Palouse prairie ecoregion of the intermountain west is one of the most critically endangered habitats in the United States. The Palouse has the capacity to serve a large suite of ecological functions such as habitat for threatened/endangered species, carbon sequestration, and erosion control. Existing remnants are small and surrounded by heavy agricultural use, and pressure from many ongoing threats make understanding how to restore Palouse prairie a pressing need. Many in the restoration community have identified the establishment of perennial forb species as a unique challenge. Examining factors that influence forb establishment during restoration can make a significant contribution to Palouse restoration. In arid regions, moisture availability is often a limiting factor for perennial plant growth cycles, and is particularly critical during their first season of establishment. To assess the importance of soil moisture in restoration planning, a greenhouse study will be conducted on the influence of soil moisture on the establishment of the perennial forb Arrowleaf balsamroot (*Balsamorhiza sagittata*). Seeds will be subjected to low, medium, and high soil moisture levels calculated from regional soil moisture data during the active growing season of *B. sagittata*. The treatments will change every 4 weeks during the growing season. Timing of true leaf emergence and leaf size will be assessed to determine plant health and establishment. I hypothesize that soil moisture will be most important early in establishment when the fastest growth is happening. *B. sagittata* is a common component of Palouse restoration

seed mixes, understanding the role of soil moisture in its establishment could be a powerful tool in designing successful prairie restorations.

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**Novel Borohydrides: Location: Senior Hall - Room 304**

*Speakers: James Yates*

*Faculty Mentors: Eric Abbey*

Boron reducing agents are some of the most versatile reagents in the organic chemistry lab. Building on the work of H. C. Brown and others, many new substituted reducing agents have been developed with varying levels of hydride donating ability. Inclusion of electron donating or withdrawing groups on the central boron atom affects the character of the boron-hydride bond allowing the hydride donating ability to be fine-tuned for better specificity and selectivity in reactions. Our lab has synthesized 12 novel borohydrides in good yield from their respective substituted potassium trifluoroborate (RBF<sub>3</sub>K) salts, work is currently underway to investigate the properties of these new borohydrides.

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**Sensitivity Analysis of a Piezoresistive Pressure Sensor for Different Aspect Ratios: Location: Senior Hall - Room 306**

*Speakers: Joe Wagoner*

*Faculty Mentors: Heechang Bae, Awlad Hossain*

The piezoresistive behavior of a material is defined as a change in electrical resistivity under an applied mechanical stress or pressure. These types of materials have gained popularity for their applications in Micro-Electro-Mechanical Systems (MEMS) pressure sensing capabilities. Here, the material can act as a transducer that offers a change in electrical signal as a function of mechanical stress applied. Typical piezoresistive pressure sensors are fabricated on silicon diaphragms. Silicon is an anisotropic material, and the behavior of the piezoresistivity is dependent on both the wafer plane on which it is fabricated on and the orientation of the sensor on that wafer plane. This research aims to analyze the sensitivity of a four-terminal piezoresistive sensor with respect to its aspect ratio under transverse load. The sensor analyzed in this study is considered to be fabricated on a p-type (100) silicon substrate where the sensor axes are collinear with the substrate axes. Several three-dimensional (3D) models are developed using Finite Element Analysis (FEA) software ANSYS, where the aspect ratio of the sensor is varied. In order to validate the FEA results, the deformation and stress results from the finite element method are compared with those found from a Finite Difference Method (FDM). Once the results are validated, further analyses will be conducted in ANSYS to study the sensitivity of the sensor. The sensitivity will be determined by observing the normalized resistance change difference (NRCD) with applied stress. Finally, sensitivities will be compared for different aspect ratios for the sensor, and again with varying pad sizes. As the future of MEMS technology aims on incorporating multiple sensing devices in smaller areas, it is important to understand the critical aspect ratio that will provide the best performance in all applications.

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**Storytelling on Instagram: Experiences as a social media influencer.: Location: Senior Hall - Room 201**

*Speakers: Thomas Ghezzi*

*Faculty Mentors: Galina Sinekopova*

Social media has taken the art of storytelling to new heights. This study looks at how authentic posts on Instagram from different businesses, social media influencers, and simply individuals create new reality. Using Visual Communication and Semiotics theoretical background, images are analyzed in terms of their rhetorical, semantic, and pragmatic value. Personal experience of being a social media manager and influencer is evaluated.

Keywords: social media, visual communication, semiotics, social influencer

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### **The Phenomenology of it all: Location: Senior Hall - Room 302**

*Speakers: Justin Campbell*

*Faculty Mentors: Ian Green*

Who is consumed when we read? Does the reader consume the text or does it consume us? This essay explores the complex and possibly parasitic relationship between reader and text. This unique exchange of knowledge and ideas between reader and texts during this relationship is the phenomenology of reading. During this, the text is transformed via the consciousness of the reader from a passive, inanimate object to an active living breathing immortal entity that transcends both space and time. In doing so, the unhuman text becomes an active consumer of the human reader in the same way the reader believes they are consuming the text. This mutual consumption by the text and the reader has a profound effect. It allows the reader to converse with a text in a wholly unique way that no other person will experience. It also transforms a text from paper and ink into a God-like figure whose ideas can torment and touch the souls of man for centuries after its initial creation. The question that haunts this paper is who is left standing after the interaction between reader and text? Is it the reader with a newfound wealth of knowledge after having engaged with and consumed the text or is it the text who stands before us having found a new host to spread its gospel?

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### **Variables affecting the prevalence of Cat Scratch Fever in Eastern Washington: Location: Senior Hall - Room 204**

*Speakers: Aleesha Grove, Tina Cao, Samantha Cheever, Halli McGraw, Jenny Peterson, Kevin Scott, Laura Tarango*

*Faculty Mentors: Krisztian Magori*

Cat Scratch Fever is a disease caused by an infection of the bacteria *Bartonella henselae* which is commonly transferred from cat to human through either a bite or scratch. Fleas are vectors for transmission of *B. henselae*, when flea feces is ingested by the cat while grooming or through breaks in the cat's skin. Infected cats are usually asymptomatic carriers while humans that become exposed display symptoms. When a human is infected by *B. henselae* common symptoms experienced include inflammation, fever, and myalgia. These symptoms can linger for weeks or months. Even more concerning is that children are the most vulnerable to Cat Scratch Fever which can become serious if left untreated. Since cats are a popular house pet it is important that there is an understanding of the circumstances that contribute to cats becoming carriers of *B. henselae* to protect at risk populations with compromised or underdeveloped immune systems. To determine the circumstances that affect a cat's likelihood of becoming infected by *Bartonella henselae* in the Eastern Washington region roughly thirty cats will be studied, fifteen cats will be from a shelter setting and fifteen family owned.

Samples will be collected from each cat to determine if they are currently carriers by swabbing the areas often involved in the transmission of infection. One swab will be taken from the right side of the oral cavity and another will be taken from under the claws of the right front paw. Polymerase Chain Reaction tests will be conducted for each sample taken to determine if a given cat is a carrier. Data collected for each cat will also include the age, gender, weight, medication, and vaccinations administered to the cat. We will cross analyze the collected data to determine correlations between incidences of infection and medical history. We predict that young cats in shelters who have not been treated with flea medication will have the highest incidence of *Bartonella henselae* bacteria.

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**Abstract: Darfur Genocide: History of Conflict and Marginalization in Sudan and the Dereliction of the International Response: Location: Senior Hall - Room 221**

*Speakers: Abdulrazik Mohammed*

*Faculty Mentors: Dorothy Zeisler-Vralsted*

The Darfur conflict is one of the world's greatest humanitarian catastrophes of the 21st century, yet the literature behind this issue is not convincing relative to the nature of the conflict. In this proposal, the conflict in Sudan is viewed as connected to previous conflicts between the North and the South. After incorporating the long history of the war in Sudan to current conflicts in Darfur, the history of Darfur will be examined leading up to the conflict through literature and Alex De Waal's text, *Darfur: A new History A Long War*. Further studies and analyses of historical conflicts in Sudan will be explored from Douglas Johnson's text *The Root Causes of Sudan's Civil Wars*. The history of Sudan will be explored through the lenses of the government of Sudan and its role in Sudan's long history of wars—one after another since independence in 1956. Colonial rule in Sudan created ethnic and geographical divisions in favor of Arabs. This, in turn, led to the early conflicts between the North and South Sudan. Through the analysis of Anders Hastrup's text *The War in Darfur*, my research concludes that the war in Darfur was a product of an Arabization ideology constructed by the government of Sudan. Arab Militias supported by the government carried out genocide against Darfur indigenous. An extensive literature review, as well as Mr. Acampo's own accounts taking the responsibility to bring the Darfur case to justice, are included in my research, revealing how weak the international response was to the genocide in Darfur. In summary, other historical conflicts in Sudan are related to the conflict in Darfur and understanding the past is crucial to comprehending the current Darfur situation.

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**Biosorption of copper ions in aqueous solutions using microorganisms: Location: Senior Hall - Room 304**

*Speakers: Martina Davis*

*Faculty Mentors: Tony Masiello, Carmen Nezat*

Microorganisms are an effective tool to consume or break-down environmental pollutants in bioremediation processes. This includes management of the heavy metal contaminates in our waste streams that would otherwise have adverse effects on the surrounding environment or would require expensive disposal processes. This research aims to characterize (or validate) the microorganisms *Arthrospira platensis* and S.C.O.B.Y (symbiotic culture of bacteria and yeast) in their ability to act as bio-sorbent of heavy metals, specifically for the removal of copper from aqueous solutions.



Microorganisms are exposed to various concentrations of copper, and adsorption of copper by the biomass is characterized using Inductively coupled plasma - optical emission spectroscopy (ICP-OES).

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### **Colonization of Mosquito from Turnbull National Wildlife Refuge**

*Speakers: Erika Magana*

*Faculty Mentors: Krisztian Magori*

In this study, mosquitos are collected from Turnbull National Wildlife Refuge (TNWR) to establish a colony in laboratory conditions. In this process, we test their ability to intake artificial diets and whether there is a preference of dark-colored oviposition sites versus light-colored oviposition sites. Observing mosquitos during feeding sessions would indicate whether or not they feed on 5% sucrose solution and sheep blood drenched on a cotton pad. The preferred oviposition site is determined by counting the number of eggs laid at each site. Eggs and larvae development is monitored with strict processes and environment conditions for proper maturation and development of a new generation.

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### **Diet Composition of Lake Trout (*Salvelinus namaycush*) in Upper Priest Lake, Idaho: Location: Senior Hall - Room 203**

*Speakers: Coty Jasper*

*Faculty Mentors: Paul Spruell*

Lake Trout (*Salvelinus namaycush*) were intentionally introduced to the Priest Lake system in 1925 with the intentions of creating a recreational fishery. As the Lake Trout population increased within this system, the native Bull Trout (*Salvelinus confluentus*) population began to decline. Possible negative impacts of Lake Trout on Bull Trout include direct effects such as predation, or indirect effects, such as resource competition. In this study our objective was to estimate the frequency of piscivory in Lake trout from Upper Priest Lake and document any possible Lake Trout predation upon Bull Trout in the Upper Priest Lake system. We obtained Lake Trout samples from this system during annual gill netting, which is performed to suppress Lake Trout. We then performed stomach dissections to identify incidents of piscivory. Although Mysis shrimp were predominant prey items, 61 of 153 examined stomachs contained partially digested fish tissue. We then extracted DNA from these tissues using an ammonium acetate precipitation protocol. We used a species DNA barcode located in the cytochrome oxidase one gene of the mitochondrion to identify said fragments. Out of a total of 61 samples 63.4% were identified as Lake Trout, 19.0% were identified as Pygmy Whitefish (*Prosopium coulteri*), 14.2% were identified as Kokanee Salmon (*Onchohynchus nerka*), and 1.5% were identified as Yellow Perch (*Perca flavescens*). Therefore, we suggest that the effects of Lake Trout on Bull Trout are not direct effects, but rather indirect effects such as resource competition. Understanding these effects is extremely important when moving forward with management decisions aimed to the restoration of historic Bull Trout population levels in this system.

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### **Finite Element Stress Analysis of 3D Printed Material: Location: Senior Hall - Room 306**

*Speakers: Nathan Navarra*

*Faculty Mentors: Alex Bae, Matthew Michaelis*

3D printing using thermoplastic filament has become an effective form of additive manufacturing. The applications of 3D printing range from rapid prototyping to full service components. Therefore, there is a growing need to predictively model the behavior of 3D printed parts. A key aspect of modeling 3D printed thermoplastics is accounting for potential stress concentrations from the material porosity generated by the laying of the print bead. This research focuses on developing FEA models to predict the failure of 3D printed tensile specimens constructed of both ABS and Carbon Fiber filled Nylon. To achieve this goal, cross-sections of tensile specimens are photographed and analyzed to determine approximate void size, shape and content. This data is used to develop 3D models for FEA analysis which include physical void representation. FEA software is used to calculate stress levels in the material based on tensile and fatigue loading. Additional specimens of appropriate geometry are tensile and fatigue tested and the results compared to the FEA models to estimate the relative contributions of stress concentrations and bead bond imperfections toward strength reduction as compared to homogeneous materials.

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**KNOWLEDGE OF HEART DISEASE AND INDICES OF PHYSICAL ACTIVITY IN HEALTH AND NON-HEALTH BASED MAJORS: Location: Senior Hall - Room 243**

*Speakers: Kailyn Sanchez*

*Faculty Mentors: Christi Brewer*

Cardiovascular disease (CVD) is the leading cause of death and is associated with modifiable lifestyle factors, like physical activity (PA). Research has examined CVD knowledge (CVDK) and PA in undergraduates; however, no research has examined the relationship between CVDK and PA in this group. **PURPOSE:** To examine differences in CVDK and PA indices between sex and major (health (HB) or non-health (NHB) based) and potential associations between CVDK and PA. **METHODS:** Students (N=241) completed an online survey with the 30-item CVDK Questionnaire and 7-item International Physical Activity Questionnaire. Cases (n=24) were removed prior to analyses due to missing data (n=217; 21.1±2.7 yrs; 145 females, 141 HB). Independent samples t-tests were conducted to test for differences in total (TK), dietary (DK), epidemiological (EK), medical (MK), risk factor (RFK), and symptom (SK) knowledge, as well as weekly frequency and duration of PA indices between sex and major. Pearson's r was used to test for linear associations between TK and PA indices. **RESULTS:** Sixty-seven percent of students met recommended PA guidelines with a minimum of 500 MET-min/week of moderate-vigorous physical activity (MVPA). Females had greater RFK than males (4.6±1.6 vs. 4.0±1.6, p=0.006). HB majors had significantly higher TK (18.4±5.0 vs. 15.3±5.3, p

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**Public Interest Litigation & Women's Rights in South Asia: Cases from Nepal & India: Location: Senior Hall - Room 221**

*Speakers: Jordan Stevenson*

*Faculty Mentors: Vandana Asthana*

As a complex, diverse and dynamic region with diverging, constantly changing constitutional and jurisprudential contexts as well as lasting legacies of patriarchy, South Asia's traditions of public interest litigation are one of the most well-studied institutions by Western audiences due to their contradictory progressive and innovative nature. Particularly in

India, where public interest litigation gives ordinary citizens extraordinary access to the highest courts of justice, questions have been raised as to the effectiveness of public interest litigation as a tool to address gender disparities across the region. Although Supreme Court justices have been a key ally in eliminating legal barriers to gender discrimination, the structure of the courts still reflect the patriarchal norms that plague society. Furthermore, a literature and case study review of gender-based litigation from India and Nepal reveals that legalistic gains are insufficient to meaningfully change the status of women relative to men in these countries. Without enforcement and policy change in legislative institutions, women still lack systemic power to change the socioeconomic barriers to equality.

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**Recordando a los Mayas - Participation of Indigenous Mayan Women in Guatemala: Location: Senior Hall - Room 101**

*Speakers: Josiah Van Egdome*

*Faculty Mentors: Martin Meraz-Garcia*

Women during the Guatemalan civil war (1960-1996) played an integral role for both sides of the conflict. Gender norms are critical in looking at how men and women approached the conflict. Assessing how indigenous women broke these norms and removed barriers in order to participate in this conflict is an area that will be covered in this research. Additionally, this study addresses how individuals on both sides of the conflict perceived each other, particularly indigenous women that were part of this armed struggle. Previous research done in Central America involving armed conflicts have used Image Theory successfully to determine perceptions of opposing parties (Cottam, Baltodano, & García, 2011). This research seeks to do the same in applying Image Theory to the Guatemalan conflict. The second component of this research looks at how women were involved in the peace talks that allowed the conflict to come to its end in the late 1990's. This work relies on peer reviewed historical records and other scholarly sources to assess the perceptions of women and the extent of their participation during the armed conflict in Guatemala. Interviews (N=10) have also been conducted and relied on heavily with participants who took part in the civilian conflict and used as empirical evidence to draw conclusions. A working hypothesis for this paper is that significant discrepancies will emerge between the actual and perceived participation and mobilization of women in the Guatemalan armed conflict.

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**U.S. Intervention in Syria: Location: Senior Hall - Room 302**

*Speakers: Christopher Poe*

*Faculty Mentors: Thomas Hawley, Taylor Kensel*

Syria has been among the many nations affected by the Arab Spring, which has led to civil strife. The dictatorship, in an effort to defend its position and fight back against calls for democracy, has taken on a violent approach and descended the country into civil war. There is debate as to whether or not the United States should get involved in the crisis in Syria. Lack of information and the threat of misinformation causes difficulty in determining action. Furthermore, the threat towards Syrian independence risks U.S. hypocrisy in regards to the sovereignty of citizens in determining the state of its government. However, the threats of ethnocentric violence and civil war, as well as the threat of further escalated conflict

involving surrounding countries outweighs the possible ethical and political ramifications of intervention. The purpose of this paper is to outline these contentions and argue for U.S. involvement in the Syrian Civil War.

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**This Topic is Awkward: Location: Senior Hall - Room 201**

*Speakers: Hayley VonHolten-McAvoy*

*Faculty Mentors: Galina Sinekopova*

In my topic, I explore the feeling of awkwardness, awkward situations, and how we can grow from it. In this presentation, I interview different people on how they would describe an awkward moment by giving me an example of an experience they have had including how it made them feel and how they dealt with it. I researched scholarly articles and books on self-consciousness, anxiety, and awkwardness. I also use personal experiences I have had in my life to reflect. I explore when we are uncertain, we are awkward. I will be focusing on conversational analysis, incongruity theory, relief theory, dramaturgical theory, and more. I discuss the importance of embracing awkward situations head on and how it helps build and shape us as people, as well with awkwardness being what keeps us human.

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**China-Nigeria Relationship Lost Opportunity to Nigeria: Location: Senior Hall - Room 221**

*Speakers: Kristina Hughes*

*Faculty Mentors: Kristin Edquist*

This paper analyzes the investment relationship between China and Nigeria in the scope of the international political economy. Specifically, it focuses on the foreign direct investment (FDI) flow between the two states. This paper takes China to exemplify a developed country, investing in the oil resources of a less developed country, Nigeria. The question is whether this interaction serves to benefit Nigeria, 'or if the current trend is nothing more than 21st-century exploitation from yet another emerging economy.' (Rich and Recker, 2013, p. 61). The paper argues that the potential benefits to Nigeria from FDI inflow are dependent upon successfully capitalizing upon terms of the agreement, the successful dispersion of benefits to society, and the upholding of the agreed upon terms by a reliable state infrastructure. Unfortunately, Nigerian officials have not prioritized these qualities in the past process of negotiating terms towards the Chinese multinational corporation (MNC) investors. To maximize the benefit of the inflow of FDI, Nigeria must minimize its concessions in the agreements made with foreign investors, increase the political stability of the institutions that enforce the FDI agreement terms, and ensure the consistent enforcement of laws and regulations. Additionally, it must overcome systemic corruption and finally put its oil wealth to use by reinvesting in the development of the country. Nigeria is in a position to reap significantly greater benefits from its relationship with China if they are able and willing to address the issues that currently restrict it. Perhaps a future study could examine Chinese FDI in other oil states to accurately describe those relationships and then compare across all inflow states to determine if trends exist.

Keywords: resource seeking FDI, exploitation, dependency, and FDI term negotiation

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**Effects of Pesticides on the Growth of Honey Bee Gut Microbes: Location: Senior Hall - Room 203**

*Speakers: Macee Mitchell*

*Faculty Mentors: Jenifer Walke*

The interaction between microbes and their animal hosts are of fundamental importance for the health of both organisms. The gut microbiome plays an essential role in metabolism, growth and development, immune function, and protection against pathogens. The presence and abundance of these microbes may be altered by environmental factors, such as exposure to pesticides. Pesticides are a widely used remedy for crop infestation and can have detrimental effects on the native and managed bee populations, which play an important role in the pollination of many plants. The goal of this project is to study the effects of pesticides on the honey bee (*Apis mellifera*) gut microbiome. Specifically, we hypothesized that if honey bee gut microbes are exposed to pesticides in laboratory assays, their growth will be altered. In this study, honey bees were sampled from two different locations in eastern Washington and two different time points, sterilely dissected, and plated onto four different media types to obtain cultured isolates. We obtained 36 morphologically-distinct microbial isolates in total, with 14 isolated on sabouraud dextrose agar, 10 isolated on trypticase soy agar + 5% sheep blood, 7 isolated on De Man, Rogosa and Sharpe agar, and 5 isolated on brain heart infusion agar media. Once isolated, the growth of these microbes will be tested against three pesticides that were prevalent among bee hives in eastern Washington (cypermethrin, imidacloprid, and tau-Fluvalinate) using 96-well plate bacterial growth assays. Isolates will then be identified by extracting, amplifying, and sequencing their 16S rRNA gene. We expect to find that some microbes will have reduced growth, potentially enhanced growth, or may be robust to pesticide exposure. Our laboratory results will inform hypotheses about the host-microbe-pesticide interactions that occur in the field, which can have important implications for bee, and thus ecosystem, health.

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**Fun and Finney Games for the Intermediate Piano Student: Location: Senior Hall - Room 302**

*Speakers: Davis Hill*

*Faculty Mentors: Jane Ellsworth, Jody Graves*

This presentation is adapted from my Masters Thesis pedagogy project under Dr. Jody Graves at Eastern Washington University. I will present and discuss composer Ross Lee Finney's "32 Piano Games." This collection of short intermediate-level pieces serves as a primer for extended techniques for the young beginner, combining many notational, gestural, pianistic, and improvisational/aleatoric devices commonplace in 20th-century American piano music in exciting and accessible ways. I will also explain how these devices influence or appear in the work of other 20th century American composers, with particular focus on Finney's students at the University of Michigan during his tenure (1948-'74). I hope to broaden understanding of this poignant and topical work, which is very much relevant to modern pianists, composers, and music teachers.

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**Hispanic and Latinx Students' Journey to Becoming A Nurse: Location: Senior Hall - Room 243**

*Speakers: Kat Morigi*

*Faculty Mentors: Martin Meraz-Garcia*

This paper is going to look at how U.S. minority students, specifically Hispanic or Latinx, experience a different pathway to the nursing program because of stereotypical barriers, lack of support, academic challenges, and emotional responses to an unhospitalited campus environment. Racial diversity in the healthcare field is essential, and the lack of diversity

among the workforce is known to be linked to the health disparities in the nation's population. The need for valuable mentorship, emotional and financial support, and creating a welcoming environment around the campus leads to an increasing encouragement for minority students to enroll in the nursing program, thus having a diverse nursing faculty that accurately reflects on the growing Hispanic/Latinx population. This paper will be reviewing four journal articles written by Registered Nurses, Assistant Professors, Nurse Educators, etc., researching and studying current or formal nursing students' experiences in the nursing program in an attempt to address the need for a fair and successful completion into the healthcare field for all minority students (focusing on Hispanic/Latinx).

Keywords: Hispanic, Latinx, nurse, student, diversity, experience, barriers

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**Testing the effectiveness of household liquids as tick repellents.: Location: Senior Hall - Room 204**

*Speakers: Nicholas Vanderholm, Hunter Lee, Jacob Ott*

*Faculty Mentors: Krisztian Magori*

In Eastern Washington *Dermacentor andersoni* and *Dermacentor variabilis* are two species of ticks that can transmit Rocky Mountain spotted fever (RMSF), and tularemia to humans and animals. These diseases can be deadly if their not treated early enough with the correct antibiotics. Due to this, it is desirable to use tick repellents to prevent the spread of these diseases. However, traditional chemicals such as Deet and Permethrin can be harmful to fish and other organisms that live in fresh and saltwater. They can also be rather expensive.. The purpose of this study is to test inexpensive, conveniently available household chemicals to evaluate their effectiveness in repelling ticks compared to commonly used, commercially sold tick repellants, and compared to using no tick repellent at all. Due to this, we will have two control groups: no chemical treatment on the tick drag, and tick drags treated with traditional chemical tick repellent. To evaluate our data, we will compare the number of ticks found on corduroy tick drags sprayed with lemon juice, vinegar, febreze, garlic juice, and motor oil to tick drags treated with nothing, permethrin, or deet. We believe that at least one household liquid will be equally, or more effective, than any of the control groups. Deet and permethrin are suspended in liquid solution; we will create similar liquid solutions using household chemicals. All of these items will be sprayed onto a corduroy tick drag, which will then be dragged through grassy terrain at James T. Slavin Conservation Area south of Spokane Washington. Drags of different treatment groups will be pulled in parallel, adjacent, 10 meter sections. The number of ticks found on each corduroy tick drag will be recorded, and compared to tick drags of other treatments groups. After data collection is complete, we then plan on conducting a one-way ANOVA statistical test to determine the significance of our data.

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**¿Si Se Puede? An In-Depth Examination of Latinx Students Experiences from Rural Washington in Higher Education: Location: Senior Hall - Room 101**

*Speakers: Ereisa Morales*

*Faculty Mentors: Edmundo Aguilar*

The purpose of this study is to interview first-generation Latinx students, in there fourth or fifth year in Central and Eastern Washington colleges, to analyze and better understand their motivation to pursue and stay in college as these students experiences are often overlooked by the majoritarian narrative in the U.S education system that is embedded in

Eurocentrism. The number of Latinx students pursuing higher education is increasing across the country, yet these students have shown to be the highest in not completing their degrees (Castellanos, Gloria, and Kamimura, 2006). Currently, there is significant research on the challenges many Latinx first-generation students face in pursuing higher education but limited research on the motivation to pursue and stay in college. Therefore, this study will investigate what motivates Latinx students attending college and the factors that may contribute to keep them from dropping out of colleges in rural Washington. Determinants such as college knowledge (e.g. applying for college, fafsa, majors), adjustment to college, and familismo will be addressed in this paper. These three factors can play an important role in academic resilience but also cause stress among Latinx students (Cabrera & Padilla, 2004; as cited in Vela, P.Lu, Lenz, and Hinojosa, 2015). The research design is a case study with a sample size of 5 participants that were interviewed. Additionally, Latina/o Critical Race Theory (LatCrit) was implemented as a theoretical lens to guide the method in the collection of the data and assist in the the project's design and discovery. The analysis reveals that, themes found in this study were: family expectations, family support, mentor support, financial barriers consistently throughout undergraduate career, and how their academics has influenced their identity.

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# Poster Abstracts

**Adaptive Paddling Capstone Project: Location: Hargreaves Hall, Reading Room - 14B**

*Speakers: Cameron Metcalfe, Guthrie Boleneus, Jacob Stewart, Cameron Vaughn, Noah Barney, Reed Siclair*

*Faculty Mentors: Robert Gerlick, Philip Kramer*

Disabled individuals often have a difficult time participating in various activities due to limited commercial products. Roy Perkins, a former U.S. Paralympic athlete with quad limb deficiency is interested in kayaking, but due to the lack of market products he does not have an option that allows him to paddle effectively. The Adaptive Paddling team is working to create a device which will allow him to safely, comfortably and effectively paddle in calm water conditions. Roy does not have wrists or hands to be able to grip a kayak paddle.

Methodology: The Adaptive Paddling device must be able to fit snugly on his arms and he must also be able to release from the paddle in case of emergency. The specifications for the design are: release time under one second, total weight under three pounds, material price under 500 dollars, and Roy will be able to do forwards and backwards strokes in flat water conditions.

Results: Per those specifications, the design proposed was an exoskeleton brace similar to those used to constrain dislocated elbows. This concept creates multiple contact points along Roy's arm, distributing the forces from the paddle across Roy's whole arm, rather than at a single point. A greater contact area will make the device more efficient and comfortable to use. Differing than an elbow brace, this design will promote elbow rotation and allow for the maximum range of motion possible. A simple slot and washer will attach the exoskeleton to a clamp on the paddle. The washer will easily be able to slide in and out of the slot, allowing Roy to detach from the paddle in any situation.

In the end, 3D printed plastic will be reinforced with an aluminum core to make up the exoskeleton. Such materials will be able to handle the expected 60 pounds of force for a total of 10,000 strokes or an estimated four year life assuming extensive use.

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**Advancing Technologies and Retreating Glaciers: a review of research methods for studying glaciers: Location: Hargreaves Hall, Reading Room - 15B**

*Speakers: Mary Lewan*

*Faculty Mentors: Erin Dascher*

Glaciers provide a wealth of information on global climate, both past and present. Nearly all glaciers are currently in a state of retreat due to anthropogenic climate change. As the climate continues to change, scientific research on how glaciers interact with and are impacted by climate will be vital. New and existing techniques for analyzing sediment deposits, and ice core data as well as advances in remote sensing, such as LIDAR imaging are some of the ways scientists are examining the relationships between climate and glacier extent. . This research reviews the relevant research methods and techniques that are being used to help investigate and track climate change impacts on glaciers.

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**Archaeology and Climate Change: Sites at Risk in the Puget Sound Watershed: Location: Hargreaves Hall, Reading Room - 1A**

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*Speakers: Christy Berg*  
*Faculty Mentors: Erin Dascher*

The Puget Sound Watershed, located along Washington's Northeast coast, contains 5,530 recorded archaeological sites. 1,290 of which are listed on the National Register of Historic Places. The majority of these sites are located along the coastline and associated waterways making them highly susceptible to climate change induced sea level rise. This research uses data provided from The Washington State Department of Archaeology and Historic Preservation and a geographic information system (GIS) to determine the susceptibility of thousands of sites to rising sea-levels. A mosaic of 10m resolution digital elevation models (DEMS) was created for the Puget Sound Watershed and elevation for each site was then extracted. This data is then compared to predicted sea level rise measurements to generate an inundation vulnerability assessment. Once complete, this research can inform potential management strategies for sites that are currently vulnerable to inundation in the state of Washington.

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**Assaying the biostimulant activity of two commercially available soil treatments: Location: Hargreaves Hall, Reading Room - 7A**

*Speakers: Sherry Napier*  
*Faculty Mentors: Luis Matos*

Biostimulants are used in agriculture to promote growth and metabolism of microorganisms within the soil. Select microorganisms can break down organic matter and increase soil nutrient availability to promote plant nutrient absorption and better crop yields. These biostimulants also can be used to promote bioremediation of polluted water bodies by enhancing the bioactivity of native microbes. A local biotech company who formulates and produces such products contacted us about testing the enzyme biostimulant activity of some of their current and potential new products. Two enzymes of particular interest are endo-cellulase and endo-1-4-beta-D-xylanase. Enzyme activity will be assayed using Megazyme kits: the Cellulase assay kit (CellG3 method) and the Xylanase assay kit (Xylazyme AX) will be used in this work. In preparation for this work, we have developed reliable standard curves for each kit ( $R^2 > 0.95$ ) using control enzyme solutions. In the coming months, two different biostimulant products will be analyzed with each kit for the specified enzyme biostimulant activities. To this end, control or biostimulated soils will be assayed for enzyme activity in a time series post stimulation. It is our expectation that these products will significantly stimulate the specific enzyme activity in these soils.

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**Beaver, Bats, and Burned Riparia The effects of beaver modified riparia on bat activity within burned and non-burned watersheds in the Methow Valley, WA: Location: Hargreaves Hall, Reading Room - 9A**

*Speakers: Cole Sherwood*  
*Faculty Mentors: Margaret O'Connell*

Within the Methow River watershed, North American Beaver are being reintroduced to streams that have been compromised by severe wildfire in hopes of reversing channel incision and restoring riparian function. Functional river systems play a critical ecological role for obligate and generalist species such as insectivorous bats, which require lentic and lotic water bodies for their aquatic-terrestrial subsidies, as well as drinking water. However, it is not well understood

how the reintroduction of beaver is impacting native bat species in burned watersheds. The objective of our research was to determine how beaver modified riparian habitat is influencing bat activity and feeding site selection of native bats in burned and non-burned watersheds within the Methow Valley, WA. We hypothesized that bat activity would be greater at the dam sites in both burned and non-burned watersheds. Our study consisted of nine paired sites, four within burned and five within non-burned watersheds. At each site we deployed one bat detector at a dam in the beaver impoundment, and another within 800 meters up or downstream of the beaver impoundment where the reach was no longer observably influenced by beaver. We recorded bat activity for twelve hours at each site, from 7:00 PM to 7:00 AM between July 23rd and August 8th, 2018. We found there was a significantly higher number of echolocations recorded at the beaver impoundments compared to non-beaver reaches in both burned and non-burned watersheds. This data suggests that native bat species may preferentially select beaver impoundments for foraging in both burned and non-burned watersheds.

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**Bone Marrow Macrophage Cell Density Plays a Regulatory Role in Osteoclast Differentiation: Location: Hargreaves Hall, Reading Room - 1C**

*Speakers: Amber Framstad*

*Faculty Mentors: Jason Ashley*

Bone modeling and remodeling are dynamic processes governed by the actions of and communication between cells that regulate bone resorption and formation. These cells include osteoclasts, which break down and resorb bone matrix and osteoblasts, which produce new bone matrix. The integrity of resultant bone is thus tightly coupled to the activity of each of these cell types. Dysregulation of osteoclast activity can result in bone loss disorders, such as osteoporosis.    Osteoclasts are derived from bone marrow macrophages (BMMs), which proliferate in the presence of macrophage colony stimulating factor (M-CSF). Osteoclastogenesis, the process of differentiation BMMs undergo to become mature, multinucleated osteoclasts, is initiated by activation of the RANK signal pathway by receptor activator of nuclear factor kappa-B ligand (RANKL). The Notch signal pathway, a cell contact-dependent pathway that relies on receptor ligand interactions that occur between cells, is also required for osteoclast maturation, though the mechanism is poorly understood. Precursor cell density may play a role in coordination of altered gene expression from a proliferative profile to an osteoclast differentiation profile via Notch activation.   

This study explores the role of density on Notch signaling in primary BMMs collected from C57BL/6 mice and seeded at increasing cell density. Osteoclastogenesis will be initiated in two groups with MCSF and RANKL. Notch inhibitor, DAPT will be added to one group. Resultant osteoclasts will be fixed and stained for tartrate-resistant acid phosphatase (TRAP) activity. Osteoclast differentiation will be evaluated by quantification of the number and size of resultant multinuclear cells. A students T-test will be used to compare measured variables between treatment and control groups at each density and an ANOVA will be utilized for comparison across densities. The results of this study will elaborate on the role of density in osteoclast differentiation.

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**Bull Trout (*Salvelinus confluentus*) can detect conspecific pheromones in a two choice Y-maze: Location: Hargreaves Hall, Reading Room - 9B**

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*Speakers: Hannah Coles*  
*Faculty Mentors: Allan Scholz, Paul Spruell*

Two stocks of Bull Trout (*Salvelinus confluentus*) were tested in a two choice Y-maze to determine if they could detect pheromones from the same natal population (population specific pheromones PSP) or from a different (conspecific) population of Bull Trout (CSP). Fish from the Pack River (PR), Idaho and the Metolius River (MR), Oregon were transferred to a fish hatchery where Y-maze studies were conducted. The Y-maze was constructed to supply well water at 12°C (blank) to both arms with the temperature and discharge of each arm matched to within 0.1°C and 0.01 l/s. One arm was randomly selected to be supplied with pheromones from fish held in stock tanks. Four types of tests were conducted with each stock: 1) blank supplied to both arms; 2) PSP + blank in one arm; 3) CSP + blank in one arm; 4) PSP + blank in one arm and CSP + blank in the other. Chi Square ( $\chi^2$ ) Goodness of Fit tests with two degrees of freedom were used to compare the frequency at which fish entered each arm to the theoretical distribution that assumed they randomly selected an arm. Both stocks exhibited no preference when blank water only was present [PR: ( $\chi^2=4.79$ ;  $p=0.091$ ;  $n=28$ ); MR: ( $\chi^2=4.67$ ;  $p=.097$ ;  $n=27$ )]. Both stocks preferred the PSP arm over the blank arm during PSP tests.

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**California Bearing Ratio Testing of Interdisciplinary Science Center Soil: Location: Hargreaves Hall, Reading Room - 18**

*Speakers: Paul Cameron*  
*Faculty Mentors: Richard Orndorff*

We tested the Interdisciplinary Science Center (ISC) soil to determine its suitability in road construction. California Bearing Ratio tests are used to determine the suitability of a soil to be used as a base, subbase, and/or subgrade when doing road or runway construction. The Atterberg limits identify the ISC soil as ML on the USCS flow chart. The plastic limit was 25, liquid limit of 27, with a plasticity index of 2. The liquid limit of the ISC soil is 16.5%. The soil is made up of nearly equal parts fines (< #200 sieve) to sand. The California Bearing Ratio (ASTM D1883) of the ISC soil is 15.5% of the standard with an optimal water content of 16.5%. This is useful as a good subgrade and a fair subbase.

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**Characterizing the role of sRNA-cagPAI-I in *Helicobacter pylori* gene regulation: Location: Hargreaves Hall, Reading Room - 3C**

*Speakers: Veronica Albrecht*  
*Faculty Mentors: Andrea Castillo*

Approximately 50% of the world population is infected with *Helicobacter pylori*, a pathogen that can cause gastrointestinal disease such as ulcers and gastric adenocarcinoma. Some strains of *H. pylori* contain a DNA region called the cytotoxin associated gene pathogenicity island (cagPAI); this region encodes virulence factors responsible for increased likelihood of disease. While many of the proteins encoded in the cagPAI have been studied, less is understood regarding how cagPAI gene expression is regulated. One mechanism bacteria use to regulate gene expression is through small RNAs (sRNAs), which are short non-translated transcripts that bind to target mRNA through complementary base-pairing and in turn down or upregulate expression. Our group previously identified three sRNAs encoded in the cagPAI, sRNA-cagPAI-I, sRNA-cagPAI-II, and sRNA-cagPAI-III. My objectives are to clone and sequence sRNA-cagPAI-I and

identify the genes it regulates. I will use the TakaraBio 5'/3' RACE kit to clone sRNA-cagPAI-I and sequence the cloned gene. The sRNA-cagPAI-I sequence will then be analyzed in TargetRNA2 to predict potential regulated mRNA targets. Finally, I will use a green fluorescent protein (GFP) plasmid-based gene expression reporter system to experimentally test the predicted mRNA targets for gene expression changes due to sRNA-cagPAI-I. Increasing knowledge of how *H. pylori* regulates genes in the clinically important cagPAI may lead to greater possibilities for treatment.

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**Compactive Effort and Unconfined Compressive Strength of Mt. Mazama Ash and Latah Creek Floodplain Soil in Eastern Washington: Location: Hargreaves Hall, Reading Room - 16**

*Speakers: Aaron Cleveland*

*Faculty Mentors: Richard Orndorff*

The eruption of Mt. Mazama nearly 7,700 years ago blanketed the Pacific Northwest in volcanic ash and resulted in the formation of Crater Lake in southwest Oregon. Remnants of this volcanic ash outcrop in the Spokane, WA area as localized channel and basin deposits that are, in some locations, as much as one to two meters in thickness. We tested Mt. Mazama ash from the Latah Creek area of Spokane (adjacent to the Latah Fault) for its geotechnical engineering properties according to ASTM standards. We determined the specific gravity, Atterberg limits, particle size distribution, and the optimum water content for compaction. We conducted unconfined compressive strength tests on compacted Mt. Mazama ash and Latah Creek soil according to ASTM Standards D698 and D2166. We then varied compactive effort and tested soil strength to determine the sensitivity of strength to compactive effort. When compacted to the ASTM standard, Mazama ash was significantly stronger than Latah Creek soil. At 60% of ASTM standard compactive effort, Mazama ash exhibited a 44% decrease in strength and Latah Creek soil exhibited a 35% decrease in strength. At 140% of ASTM standard compactive effort, Mazama ash was 30% stronger and Latah Creek soil was 28% stronger. Based on these results, the Mazama ash is more sensitive to compactive effort than the surrounding Latah Creek soils. Ash beds underlay areas undergoing development in Spokane, so understanding their engineering properties is vital to predicting the long-term stability of surface infrastructure.

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**Competition Driven Semelparity of Brook Stickleback (*Culaea inconstans*) in Turnbull National Wildlife Refuge.: Location: Hargreaves Hall, Reading Room - 9C**

*Speakers: Sasha Goheen*

*Faculty Mentors: Paul Spruell*

The evolution of a semelparous reproductive strategy is usually contributed to extreme predation which allows a species only one reproductive opportunity. Competition driven semelparity (CDS) is a single reproductive cycle before death that is driven by competition between parents and offspring. In metabolic theory, the somatic maintenance rate increases faster with animal body size than the rate of food intake and the critical resource density where ingested energy to cover maintenance requirements increase with body size, suggesting that smaller-bodied juveniles may competitively exclude their larger-bodied parents. Brook stickleback (*Culaea inconstans*) are small fish (about 5 cm long at maturity) considered to be an annual species that have invaded the historically fishless waters of Turnbull National Wildlife Refuge (TNWR) in Spokane County, Washington. There is a strong diet overlap between brook stickleback juveniles and adults which may

result in non-overlapping generations due to CDS since there are no local piscivorous predators in TNWR. The objective of this study was to gather evidence to determine if CDS is occurring in the brook stickleback populations at TNWR by examining relative densities of adults to juveniles and cohort growth over a season. Fish were captured using baited minnow traps in two ponds at TNWR, three times a month for three months, and measured for length immediately after capture. No clear evidence of mortality of the largest fish was observed, as predicted by a CDS model. Though a pulse of juveniles was observed in early spring as expected, data was inconclusive, likely due to early spring juveniles reaching similar lengths as adults very quickly and possible low levels of continual reproduction throughout the summer.

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**CONTACT METAMORPHISM, MINERALIZATION, AND DETRITAL ZIRCON INTERPRETATION FROM SILVER HILL SPOKANE WASHINGTON: Location: Hargreaves Hall, Reading Room - 22**

*Speakers: Jeremy Shaw*

*Faculty Mentors: Chad Pritchard*

Silver Hill, in Spokane County, WA, hosts an abandoned tin-tungsten mine from the early 1900's. Detrital zircon (Dz) analysis yielded unexpectedly young Dz ages in the host rock. Twenty-seven of 113 Dz grains were about 48 million-years-old from a rock mapped as Mezoproterozoic metasedimentary rocks, or approximately 1.45 Ga old Belt Super group. Why and how did these young Dz crystals form? There are a few possible reasons why very young Dz are present in the quartzite, but one key factor is that the proximal and sometimes cross-cutting (intruding) granite is also about 48 Ma old (Stephens et al., 2017). Possible hypotheses for these young DZ ages: 1) Dz grains were deposited with ash fallout than sedimentary processes. 2) Young Dz grains were from contamination during sample preparation. 3) Dz grains crystallized during contact metamorphism from the granite. \_x000D\_

Younger Dz in the quartzite were small, 20 micron and equant, suggesting that they were not eroded or transported. Burial, lithification, uplift and high temperature (600° to 900°C) would suggest recrystallization by contact metamorphism. Obliterated small and equant zircons crystal associated in an ash deposit. Contamination was discluded because small grains of Dz were observed in micro-probe analyses which was done at WSU to analyze the samples of granite and quartzite. This data yielded the different types of feldspar's within the rock and examined the grains that were in contact with one another to analyze using two-feldspar temperature and pressure ratios. This was to determine where in the thermal gradient the young Dz crystals grew and to show it was not deep enough for complete of the rock. The similarities of age of the granite and the younger Dz grains suggest contact metamorphism. The presence ore: sheelite, wolframite and Cassidertie also suggest shallow hydro-thermal enrichment associated with contact metamorphism. This study concludes that the ore enrichment was likely coeval with the intrusion.

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**DETAILED SEDIMENTOLOGICAL ANALYSIS OF THE LATAH FORMATION FROM CORE 5, CHENEY, WA: Location: Hargreaves Hall, Reading Room - 15C**

*Speakers: Jayce Lazuhrcatt*

*Faculty Mentors: Lindsay MacKenzie*

The Latah Formation, located in Eastern Washington, is a sedimentary unit of Miocene age overlying granitic basement, and interfingered and overlain by Columbia River Flood Basalts. The Latah Formation is

interpreted to represent a largely lacustrine paleoenvironment. It is comprised predominantly of fine-grained sediments. The Latah Formation contains an important and unique fossil record that provides insight into the paleoenvironment and climate of Miocene Eastern Washington. While much work has been done examining the fossil biota and a broad understanding of the geologic events that led to the Latah Formation's deposition has been explored, little work has been done in examining the depositional history on a small scale. Here we present a detailed analysis of a drill core (Core 5) from a well near Cheney, WA in Spokane County. Core 5 contains three intervals of the Latah Formation exposed between interfingerings of the Grand Ronde flows and overlain by the Wanapun flows of the Columbia River Basalts. The Latah Formation is dominated by weakly-indurated mudstones and siltstones, and has varying concentrations of organic carbon (fossil plant fragments). Decimeter-scale analyses of the Latah Formation reveal at least eight distinct sedimentary facies representing multiple depositional energies and environments. This data will be compared to local outcrops where similar Latah Formation intervals are exposed to examine the lateral continuity of these facies within the local depositional basin. This detailed interpretation of the sedimentary history will allow for a more complete picture of that past depositional environment of the Cheney area in the Miocene.

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**Development of a constitutively expressing serratiopeptidase secretion system in *Lactococcus lactis*: Location: Hargreaves Hall, Reading Room - 8A**

*Speakers: Taylor Mauzy*

*Faculty Mentors: Luis Matos*

Many inflammatory diseases can progress to unresolved chronic inflammation and eventually death. The Rand Corporation estimates that in 2014 approximately 60% of Americans had at least one chronic inflammatory condition, and up to 12% had at least five conditions. Therapies for these disorders are limited but emerging enzyme therapies offer new hope for treating chronic inflammation. One enzyme with promise is serratiopeptidase, a proteolytic enzyme produced by the bacteria *Serratia marcescens* within the gut of silk worms. Serratiopeptidase displays anti-inflammatory, anti-edemic, fibrinolytic, and caseinolytic properties. Here, we propose a microbial probiotic expression system for serratiopeptidase to help overcome a major challenge in oral enzyme delivery: low bioavailability. Our hypothesis is that this new delivery system will increase enzyme bioavailability. Therefore, the aim of this study is to develop a protein expression system with a food grade expression vector and probiotic host that together will constitutively express and secrete serratiopeptidase. *Lactococcus lactis* is perfect as a host as it is used extensively in the dairy industry and is among the generally recognized as safe (GRAS) microorganisms approved for use by the FDA. A codon-optimized food-grade vector with serratiopeptidase under the control of a constitutive promoter and a secretion signal was designed (pEWU1, 4776bp). Additionally, the vector was genetically watermarked for trademarking purposes. Vector synthesis was contracted to GenScript ([www.genscript.com](http://www.genscript.com)) but they failed to deliver the vector. GenScript failed to achieve final assembly and delivered two fragments in pUC57. The two fragments when combined would form the complete pEWU1 vector. We have now successfully assembled the two fragments furnished to us by GenScript into a complete pEWU1 molecule and will now proceed to transforming *L. Lactis*.

**Discovery of Antibiotic-Producing Bacteria from Local Soil Samples: Location: Hargreaves Hall, Reading Room - 11A**

*Speakers: Xiaolei Mao, Michael Shane Martin*

*Faculty Mentors: Suzanne Bassett*

An antibiotic crisis is looming since antibiotic-resistant microbes are emerging faster than antibiotics are being discovered. The soil is a rich source of antibiotic-producing microbes, as most antibiotics used to treat infectious disease were derived from soil microbes. In search of novel antibiotics, local soil samples were used to culture antibiotic-producing bacteria. Serial dilutions were performed on soil samples and a variety of bacteria were cultured.

Approximately thirty bacterial isolates were screened for antibiotic production using *Staphylococcus epidermidis* and *Escherichia coli* as Gram-positive and Gram-negative tester strains, respectively. Pure cultures of antibiotic producers were obtained, and potential identification was performed through 16S rDNA sequencing of polymerase chain reaction products. Discovery of novel antibiotics may lead to more effective therapies in the future.

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**Distribution of zinc toxicity levels in surface waters across Washington State: Location: Hargreaves Hall, Reading Room - 17**

*Speakers: Taylor Hogue*

*Faculty Mentors: Carmen Nezat*

Since the mid-1800's, extensive mining projects have riddled the state of Washington contaminating freshwaters with large concentrations of toxic waste. Recent studies have suggested that local water hardness can decrease toxicity levels of heavy metals including Cu and Zn. The purpose of this study was to investigate the distribution of Zn toxicity levels in surface waters across Washington. In 2018, the Washington Department of Fish and Wildlife collected 648 water samples from 100 waterbodies across the state during the Early Detection Zebra/Quagga Mussel Monitoring program. Samples were analyzed for Ca, Mg and Zn concentrations using an ICP-OES at Eastern Washington University. Ca and Mg concentrations ranged from 0.2 – 267.8 mg/L and 0.02 – 919.2 mg/L, respectively. Sample hardness was calculated as  $[CaCO_3] = 2.50[Ca] + 4.1[Mg]$ . Further, acute and critical Zn toxicity levels were calculated based on CaCO<sub>3</sub> levels according to EPA guidelines. Approximately 25% of the samples exhibited Zn concentrations greater than critical toxicity levels. High levels of dissolved metals, including Zn, in surface waters have been linked to the decline in native fish populations such as the white sturgeon in the Upper Columbia River. Therefore, the large percent of toxic samples collected in Washington is especially concerning and likely poses an immanent threat to local ecosystems.

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**Effect of metal-doping on the structural and magnetic properties of Cu(NO<sub>3</sub>)<sub>2</sub>(pyrazine) and Cu(pyrimidine)(NO<sub>3</sub>)<sub>2</sub>(H<sub>2</sub>O)<sub>2</sub>: Location: Hargreaves Hall, Reading Room - 12B**

*Speakers: Sydney Kaeck*

*Faculty Mentors: Jamie Manson*

Quasi-one-dimensional (Q1D) chains composed of  $S = \frac{1}{2}$  Cu(II) cations have been intensely studied for many years. Two particular architectures, linear and zig-zag, are of keen interest because the underlying physics is completely different. For instance, the  $S = \frac{1}{2}$  linear chain is gapless over all temperature and magnetic field regimes whereas the zig-zag chain is gapped and can be explained by the sine-Gordon model. Among metal-organic systems are the linear and zig-zag chain

compounds  $\text{Cu}(\text{NO}_3)_2(\text{pyz})$  (pyz = pyrazine) and  $\text{Cu}(\text{pym})(\text{NO}_3)_2(\text{H}_2\text{O})_2$  (pym = pyrimidine), respectively. Perturbations to the magnetic ground state could be achieved by site disorder wherein variable amounts of Cu(II) ion could be replaced by diamagnetic dopants such as Zn(II) or paramagnetic ions such as Co(II) or Ni(II). Interestingly, we found  $\text{Cu}(\text{NO}_3)_2(\text{pyz})$  to be highly resistant to doping whereas  $\text{Cu}(\text{pym})(\text{NO}_3)_2(\text{H}_2\text{O})_2$  can accommodate a broad range of dopant concentrations. We will present current progress on this project including X-ray crystal structures and preliminary magnetic data.

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**Effect of Nutrition on Honey Bee Gut Microbiome, Disease Occurrence, and Hive Growth: Location: Hargreaves Hall, Reading Room - 10A**

*Speakers: Shelby Fettig*

*Faculty Mentors: Jenifer Walke*

Honey bees are major pollinators of many important food crops, but unfortunately, population declines are threatening global food security and ecosystem health. Honey bees are under multiple stressors, such as poor nutrition, pathogens, and pesticides. Similar to human health, the gut microbiome of the honey bee is hypothesized to affect the bee's overall health by supporting the host's metabolism and immune system. However, it is not clear how these environmental stressors impact the gut microbiome, and thus health, of honey bees. Furthermore, nutritional supplementation could mitigate the negative effects of stressors, particularly for bees that do not have access to a diverse array of floral resources. In this study, we conducted a field experiment on 16 honey bee hives to test if nutritional supplementation impacts gut bacterial community structure and function, disease occurrence, and overall colony health. To assess gut bacterial community structure before, during, and after feeding treatments, we used 16S rRNA gene amplicon sequencing on the Illumina MiSeq platform. Bioinformatic programs QIIME and PICRUST were used to analyze how nutritional supplementation affected gut microbiome community structure and predicted function. We found that supplemental nutrition may help bee colonies establish and grow at a quicker pace initially before leveling out with control hives. However, this pattern tended to vary depending on the environment of the hives. For a subset of timepoints, we screened for Varroa mites and the microsporidian pathogen Nosema. Nosema infection did not vary between feeding treatments, but hives given the nutrition supplement tended to have more Varroa mites than control hives. Varroa mites can transmit many harmful viruses to the bees, so this result suggests that our supplement may have negative effects on bee health. Gut microbiome data will provide further insight into how our nutrition supplement affects honey bee health.

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**Effect of Sleep on Cognitive Outcomes in Patients with Stroke or Brain Injury in an Inpatient Rehabilitation Setting: Location: Hargreaves Hall, Reading Room - 27**

*Speakers: Sarah Neveux*

*Faculty Mentors: Elena Crooks*

Cognitive function is heavily influenced by sleep. Poor sleep is associated with impaired cognitive flexibility, attention, memory and learning. Sleep impairments are common after sustaining a stroke or traumatic brain injury (TBI). The purpose of this study was to determine whether sleep could predict cognition in a sample of patients attending an inpatient rehabilitation facility (IRF) for acute stroke or TBI. Thirteen subjects ( $67.5 \pm 5.7$  years) attending an IRF for acute stroke



(n=10) or TBI (n=3) completed the study. Activity levels were continuously monitored with wrist activity monitors to assess each subject's sleep duration during the nighttime hours near admission to the IRF ('baseline sleep'). Cognition was assessed with the Trail Making Test (TMT) near admission to the IRF ('baseline cognition'), and again 10 days later, near discharge from the IRF ('discharge cognition'). Change in cognition was calculated by subtracting baseline cognition scores from discharge cognition scores. We found that baseline sleep predicted both baseline and discharge cognition. Specifically, poorer sleep was predictive of poorer TMT scores. However, baseline sleep was not predictive of change in cognition. Findings indicate that while sleep is predictive of performance on the TMT, a task incorporating visual scanning and perceptual function, sleep duration during a single night may not be directly associated with changes in cognitive recovery post-stroke or post-TBI.

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**Effects of intranasal oxytocin pre- and post-treatment in a rat model of PTSD: Location: Hargreaves Hall, Reading Room - 4C**

*Speakers: Samantha Hilfiker, Rachel Westerman, Tedra Moorhead, Shayla Storaci, Cesar Guzman*

*Faculty Mentors: David Daberkow*

Oxytocin has anxiolytic effects, including reducing hypervigilance and exaggerated startle responses as commonly observed in anxiety disorders such as post-traumatic stress disorder (PTSD). The goal of this study was to determine if oxytocin's effects are time-dependent regarding the stimulus (fear conditioning). Stress responses were measured physiologically (heart rate, hematocrit and corticosterone) and behaviorally (freezing and fecal production). Using an auditory and shock fear-conditioning paradigm in male Sprague-Dawley rats, we demonstrated a reduction in fear responses when oxytocin was administered intranasally (dose 1.0 µg/kg) one hour prior to the fear stimulus. Stressors enhance the production of corticosteroids by the adrenal cortex resulting in an increased excretion of these metabolites in their feces and urine. Corticosterone, a homolog to cortisol in humans, is the primary glucocorticoid in rodents; therefore, fecal metabolite levels were measured using an enzyme-linked immunosorbent assay. Results showed the group with oxytocin administered one hour prior to fear conditioning had lower corticosterone levels and post-oxytocin treatment had higher levels of corticosterone at the 24-hour post-fear conditioning analysis. Oxytocin was trending to have anxiolytic effects when administered prophylactically. Studies have characterized PTSD to be a failure in the stress-response system to regain homeostasis, associating it with lower levels of cortisol in humans chronically. Initially, corticosterone levels are high and then drop as the stress is continuous. The work in this study prompts further examination of corticosterone in fear conditioned rats with a longer timeframe.

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**Effects of restoration techniques on wetland plant communities and prevalence of invasive grass species in and around Turnbull National Wildlife Refuge: Location: Hargreaves Hall, Reading Room - 5B**

*Speakers: Jade Clinkenbeard*

*Faculty Mentors: Joanna Joyner-Matos*

For hundreds of years humans have been draining or filling in wetlands to convert them for agriculture and/or for urban uses to accommodate growing populations. Eastern Washington has a similar history and areas like Turnbull National Wildlife Refuge (TNWR) have been created to protect the plants and animals that live in wetlands. Wetland restoration on

TNWR has used excavation or flooding techniques, although the relative merits of the two approaches are not known. We studied how these two techniques affected plant species diversity in restored wetlands and whether these techniques affect the presence of the invasive Reed Canary Grass (*Phalaris arundinacea*). We hypothesized that wetlands restored through excavation would have higher plant diversity, comparable to reference (never drained) wetlands, than would those restored through flooding. We also hypothesized that excavation would be the most successful way of reducing the presence of *P. arundinacea*. We evaluated eleven wetlands, four excavated wetlands, four wetlands that were flooded and three reference wetlands. Monthly (April – Sept. 2018) we recorded water depth and plant species percent along one or two transects in each wetland. We also identified to species every plant that was found in or out of the transect plots. We identified a total of 35 plant species. The number of species per wetland ranged from 4-17 and did not differ significantly between wetland categories ( $p > 0.327$ ) nor by time since restoration. The invasive *P. arundinacea* was present in all wetlands but did not differ between wetland categories ( $p > 0.278$ ). These results suggest that the current restoration techniques are successful in supporting plant communities that are indistinguishable from reference wetlands.

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**Effects of structural order on magnetic properties of  $S = 1$   $[\text{Ni}(\text{HF}_2)(\text{pyz})_2]\text{PF}_6$ : Location: Hargreaves Hall, Reading Room - 12C**

*Speakers: Ashley Glover*

*Faculty Mentors: Jamie Manson*

We have discovered a third polymorph in the  $[\text{Ni}(\text{HF}_2)(\text{pyz})_2]\text{PF}_6$  family of coordination polymers. As compared to the previously published structures that possess structurally ordered frameworks<sup>1</sup>, a new example features a disordered, monoclinic unit cell. This new variant allows us to examine the effects of structural order and disorder on superexchange pathways, specifically along the Ni-FHF-Ni and Ni-pyz-Ni directions. We consider the local distortions to the Ni(II) coordination sphere and the geometries afforded by the ligands. This presentation will address the possible discrepancies in magnetic properties for these polymorphs as gleaned by examination of their structures.

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**Effects of Warming on Wetland Microbial Communities at Turnbull National Wildlife Refuge: Location: Hargreaves Hall, Reading Room - 2B**

*Speakers: Marissa Medina*

*Faculty Mentors: Justin Bastow*

Wetlands are highly diverse areas that play key roles in the biogeochemical processing of carbon. Human alteration of wetlands and climate change have shifted the balance of carbon movement between wetlands and the atmosphere due to shifts in soil microbial communities that regulate biogeochemical processes. The main objective of this study was to look at the potential impacts of warming with climate change on microbial abundance and diversity. Our field experiment involved 36 wetlands with 3 plots in each wetland, and 12 wetlands of each type (12 permanent, 12 semi-permanent, 12 ephemeral). This was coupled with a warming experiment by placing open top warming chambers on one plot in half of all wetlands (6 permanent, 6 semi-permanent, 6 ephemeral) to compare differences in soil microbial communities between treatments. Quantitative PCR (qPCR) assay was used to quantify 16S rRNA gene copy numbers in collected soil core samples for each treatment at two separate soil depths (0- 10cm and 10-20cm). A Qiagen soil DNA analysis kit was used

to extract DNA from soil samples and plasmid DNA was used as a standard. A standard curve was established by running triplicate reactions of 10-fold dilutions (10<sup>8</sup> to 10<sup>2</sup> gene copies) of the control plasmid. The gene copy numbers in each sample were then calculated from the standard curve, by averaging the replicate values. Total microbial abundances differed between soil depths ( $p= 0.00071$ ) and warming treatments ( $p= 0.045$ ), although no differences were seen between wetland types ( $p= 0.082$ ). This data will be compared to Illumina sequencing data that might illustrate potential differences in soil microbial diversities to gather a larger picture of the wetland soil microbiome in each treatment.

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**Environmental and Anthropogenic Factors Affecting Coral Health: Location: Hargreaves Hall, Reading Room - 6C**

*Speakers: Kristin Jones*

*Faculty Mentors: Krisztian Magori*

Plastic pollution is a large and growing problem in our ever producing world. Not only does it litter our cities, but it is cluttering up the natural world as well, the largest being our oceans. Plastic is dumped into the seas where it floats and slowly breaks down into microplastics that are then ingested by marine animals. I will conduct an experiment to test the effects of micro plastics on coral health by subjecting palythoa corals to different plastic levels in a controlled environment. I hypothesize that corals will ingest micro plastics and will suffer health consequences, leading to a further threat to marine environments and the organisms that rely on a healthy ecosystem. Another human threat to marine ecosystems is the use of sunscreen by swimmers and divers enjoying the sight of ocean reefs. Sunscreen emits harmful chemicals that are detrimental to coral health, even in small amounts. To address this concern, I also tested the effects of a small amount of normal sunscreen and coral safe sunscreen in order to determine their effect on coral health and survivability. I hypothesize that the normal sunscreen will cause damage to the corals, and the coral safe sunscreen will behave like the control, with no detrimental health effects.

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**Establishing a quantifiable phenotype associated with Succinic Semialdehyde Dehydrogenase Deficiency in *Drosophila melanogaster*: Location: Hargreaves Hall, Reading Room - 7B**

*Speakers: Seth Buller, Peyton Owen*

*Faculty Mentors: Luis Matos*

Succinic semialdehyde dehydrogenase (SSADH) deficiency is a rare human autosomal recessive disease preventing those affected from properly breaking down the neurotransmitter GABA. GABA builds up in the brain and the excess molecules enter a deleterious biochemical pathway which can cause numerous health problems including developmental delay, hypotonia, ataxia, and seizures. Despite the severity of the symptoms there are currently no reliable methods for treating the disease. Further research requires a reliable animal model and although a mouse model is available, it is expensive and time consuming. In this study we use two unique knock-out SSADH *Drosophila melanogaster* lines in an attempt to find a quantifiable phenotype. We expect to observe a quantifiable difference in mobility between the wild type and mutant lines. To this end, we have assayed fly larva mobility multiple times using an established protocol where third instar larvae are placed individually on clean agar plates over graph paper, and the number of times that each larva crosses a line over a period of a minute is determined. The knock-out SSADH fly larvae crossed significantly fewer lines when

compared to the wild type flies. In an attempt to exacerbate the phenotypical difference between the control and the two knock-out lines, we reared larvae on three types of food: control food, 10 mg/ml of GABA, and 10 mg/ml Glutamic acid. These larvae were then subjected to the crawling assay described above. The expectation is that either GABA or Glutamic acid will either intensify or alleviate this discernible phenotype in the knockout lines. It is our hope that this tractable and inexpensive model will allow us to identify compounds that might ameliorate this disorder.

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**Examining the impact of e-cigarette “e-juice” components on development using the *Drosophila* model: Location: Hargreaves Hall, Reading Room - 7C**

*Speakers: Jose Osuna, Kyanna Cusick*

*Faculty Mentors: Luis Matos*

Electronic cigarettes (e-cigs) are being marketed as a “safe alternative” to traditional cigarettes because of the known health risks associated with cigarette smoking. Additionally, E-cigs are widely marketed as a way to quit smoking because the amount of nicotine can be reduced over time. As a result, approximately 9 million adults in the United States (3.7% of adult population) use e-cigs at least a few times per week. In addition, in 2016 the U.S. Surgeon General reported that e-cig use by high school students had increased by 900% between 2011 and 2015. This means that teens are using e-cigs more commonly than traditional cigarettes. Instead of tobacco, e-cigs burn a liquid “e-juice”, typically consisting of nicotine and a solvent to make an e-liquid that is volatilized by a heating element and inhaled as an aerosol. The e-juice solvent usually consists of propylene glycol and vegetable glycerin. In bacterial, e-juice aerosol exhibits cellular toxicity and DNA damage. Here we used a standard concentration of unflavored and nicotine-free e-juice to determine whether *Drosophila* eggs would be adversely affected by the e-juice aerosol. Because the 12 hour period after oviposition is mitotically active, we exposed newly oviposited eggs to e-juice aerosol and then observed the development of those eggs to the adult stage. Compared to a un-vaped control, there were no adverse effects ( $P < 0.05$ ) in hatchability, developmental timing, and number of adults or adult sex ratio. In the future we will test the effects of vaping virgin females and males prior to mating and subsequent development. Additionally, as it is well documented that the metal elements in the vaping apparatus “wear out”, we will be testing whether the age of the element adversely affects development.

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**Experiments to Synthesize Bizarre Soft-Sedimentary Features and Clastic Dikes: Location: Hargreaves Hall, Reading Room - 24**

*Speakers: Chelsi Howard*

*Faculty Mentors: Chad Pritchard*

Clastic dikes are intrusions of sediments into layers of other sedimentary strata, and can be found in various places across Eastern Washington. Two notable sites include Burlingame Canyon in Touchet, WA and in the Tacannon Valley near Starbuck, WA. At these locations, sand and fine-grained sediments interact in unique ways, which can potentially be reproduced in a laboratory setting. Clastic dikes are thought to be formed by either the overburden or from seismic activity (Smith, 1993). In this case, the clastic dikes were formed by the load-force of glacial Lake Lewis (Obermeyer; Denlinger and O’Connor, 2013) and Pleistocene megafloods (known commonly as the Missoula Floods) that washed over much of the Scablands, potentially creating seismic energy in the cataclysmic sized torrents. We were able to recreate this

environment by layering saturated play sand below and on top of dry kaolinite clay, and slowly adding load force pressure up to 1,600 pounds. While this showed evidence of air bubbles escaping to the surface from the top layer of sand, there was no formation of clastic dikes. Next, we used a higher energy mechanism by hitting the surface of the layered, saturated play sand and kaolinite clay with a rock hammer. This was able to show the air bubbles escaping the softer sediments, and pulling the clay up to fill in the trail left by the air bubbles and initiated the intrusion of sand into the clay causing the formation of a clastic dike. These dikes were formed on mounded sediments rather than the lower, more even surfaces. Laboratory experiments produced similar features and highlighted the importance of saturation of sediments and bubble transport of sediments to cause clastic dikes, though some dikes may be infilling of existing fractures from sediments above.

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**Genetic Identification of Signature Microbial Species in the MS model: Location: Hargreaves Hall, Reading Room - 8B**

*Speakers: Tristan Bennett, Isaac Munroe, Shaw Hesse, Athena Miller*

*Faculty Mentors: Javier Ochoa-Repáraz*

Multiple sclerosis (MS) is an autoimmune disease where immune cells attack the spinal cord, specifically the myelin sheaths around neural axons. With MS, the microbiome can be a factor that can affect the progression and severity of the disease. We hypothesized that housing conditions, a factor known to impact the composition of the microbiome, would affect the severity of the experimental autoimmune encephalomyelitis (EAE), a mouse model of MS. Disease was induced in mice bred in-house and purchased from a vendor. Disease severity and weights. Stool samples were collected from all mice on day 0 and at the end of experiment. We found a not significant difference between in-house and purchased mice regarding EAE severity, and an insignificant negative correlation with weight loss. By using PCR we aim to compare the relative abundance of certain species of bacteria that have been found increased or decreased in MS patients. Our analysis compared quantitatively the abundance's of these microbes in the gut microbiota of MS and control mice with a commercial or in-house origin. This approach could help identifying key bacterial species in the microbiota of a healthy mouse and a diseased mice as a valuable experimental tool for other laboratories.

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**Housing Discrimination in the Tri-Cities Latines Community: Location: Hargreaves Hall, Reading Room - 13B**

*Speakers: Angelica Garcia-Macias*

*Faculty Mentors: Martin Meraz-Garcia*

The focus of this study is on housing attainment in the Latines community in Tri-Cities, Washington. According to a study conducted by Carpusor and Loges in 2006, discrimination happens because names serve to activate stereotypes. Carpusor and Loges researched the African American and Arabic community and inspired this work. This study uses Critical Race Theory (CRT) and Latines Critical Legal Theory (LatCrit) as a theoretical framework along with a three-part method to find name, phenotype and language discrimination that affects accessibility to housing in Tri-Cities. These theories serve to highlight the differences in service detected in the surveys and the audits. The investigation incorporates information on testing conducted by the Northwest Fair Housing Alliance (NWFHA); phenotype discrimination or racial profiling is assessed through the qualitative case studies and testing by the same agency. The first phase relies on 20 onsite surveys

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with a qualitative component conducted on Latines participants in the Tri-Cities area. The second part of the study uses an email to contact 20 realty management companies to assess their rental practices towards diverse communities utilizing 4 different aliases consisting of a White male and a Latines male. The second trial of alias testers consists of a White female and a Latines female. Phase three, consist of conducting an in-person assessment testing on the listed 8 realty companies. The survey's data highlight unprotected vulnerable groups within the Tri-Cities. The email responses and testing measure discrimination analyzing the positive and negative responses each alias receives. Information exchanges are reviewed, in order to understand covert inequities in renting practices.

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**Hydrogeologic Properties of CRB Continuous Core: Location: Hargreaves Hall, Reading Room - 25**

*Speakers: Greysen Bjork*

*Faculty Mentors: Chad Pritchard*

Groundwater resources in Miocene Columbia River Basalt (CRB) aquifers have been strained in the Cheney and West Plains area of Spokane County due to increased drawdown and contamination. Groundwater in the West Plains is generally encountered at about 70 meters below the ground surface in the Sentinel Bluffs Member of the Grande Ronde Basalt. Deeper wells (greater than about 600 meters) can also access groundwater from pre-Neogene basement. Utilizing continuous core donated by the City of Cheney from exploration for Water Well #5 reveals potential aquifer zones based on the abundance of mineralized fractures, increased size and percent of vesicles, and sedimentary interbeds.

Understanding zones of expected groundwater has many direct social implications, including identification of potential horizons for groundwater injection, storage, and recovery. Identifying zones that CRB has interacted with groundwater also helps identify zones of potential alteration to test mass-loss by alteration of CRB in a stratigraphic sequence of units.

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**IAM3D Hovercraft: Location: Hargreaves Hall, Reading Room - 14A**

*Speakers: Cameron Metcalfe, Joseph Lenoue, Jack Kelly, Ben Zuniga, Qasim Alqasim*

*Faculty Mentors: Jason Durfee*

Natural disasters can happen at a whim. They affect large areas of land, often making the terrain untraversable. These disasters greatly impact the time it takes for emergency help to arrive, and this delay can be the difference between life and death. One type of vehicle that can overcome these obstacles is an unmanned hovercraft. Hovercrafts are amphibious and can go into hard to reach areas without risking more lives. By using additive manufacturing, a scale model prototype can be developed and will compete in a competition against similar hovercrafts across the nation. A traditionally designed hovercraft is problematic because a single lift hull needs a calculated weight distribution to be stable. Steering is greatly impacted by a forward or backward leaning hull. By breaking the single lift hull into smaller modular pods, they can be repositioned into unique shapes based on the design of the frame connecting them. The advantage of having the lift pods is that loading and unloading cargo can happen between the pods and under the frame. This keeps the center of gravity aligned with the center of the vehicle. By simply positioning the hovercraft over a care package, the package can be attached to the bottom of the frame with grippers. The placement of the horizontal propulsion fans are on both sides of the middle bar of the H frame. These fans are bi-directional which allows rotation about the center point. Resulting from these

changes are improved steering performance along with an ease of loading and unloading. The Eastern Washington University hovercraft took first place at the ASME IAM3D competition, beating schools from South Dakota, Florida and Georgia. The competition was based off design, materials used and performance. In each category, the EWU hovercraft scored the highest, culminating in the fastest performance run by a narrow margin. The unique design was both innovative and effective and provides a look into the future of additive manufacturing.

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**Impact of Chytrid Fungus Pathogen on Skin Microbiome of Columbia Spotted Frogs in Northern Idaho: Location: Hargreaves Hall, Reading Room - 10B**

*Speakers: Philip Campos*

*Faculty Mentors: Jenifer Walke*

Amphibians worldwide are under threat from the infectious disease chytridiomycosis, which is caused by the chytrid fungus *Batrachochytrium dendrobatidis* (Bd). Bd is associated with the population declines of an estimated 500 species and the extinctions of 90 species, making this the greatest documented loss of biodiversity attributed to a disease. The skin microbiome is a crucial factor in the ability of an amphibian species to tolerate the disease. A two-way relationship is thought to exist between Bd and the skin microbiome: Bd is known to affect the microbial community composition of amphibian skin when present and the microbial community composition can also affect the ability of Bd to spread. DNA skin swab samples from 399 Columbia spotted frogs (*Rana luteiventris*) were obtained by the Idaho Department of Fish and Game in 2013-2014. Frogs were sampled from a total of 153 wetlands in northern Idaho, with Bd being detected on frogs in 80% (n = 123) of the sampled wetlands. Of the 399 frogs tested for Bd presence, 65% (n = 261) tested positive, 29% (n = 115) negative, and 6% (n = 23) equivocal. The average infection intensity was low, with zoospore equivalents ranging from 0 to 98.8. To test for differences in the skin microbiomes of infected and uninfected frogs, the microbial community composition will be characterized using amplicon barcoded sequencing of the V4 region of the 16S rRNA gene. We expect to see differences in the proportion of antifungal microbes, which could possibly explain the low zoospore equivalents observed. Our results suggest that Bd is prevalent, but at low infection intensities, among Columbia spotted frogs in northern Idaho. From continued study, we can better our understanding of 1) the effect of Bd presence on the skin's microbial community composition and 2) the effects of microbial community composition in protection against Bd in northwestern amphibian populations.

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**Impact of prophylactic intranasal oxytocin on signs of fear in a mouse model of PTSD: Location: Hargreaves Hall, Reading Room - 4B**

*Speakers: Mitchell Gainer, Kassandra Whitworth, Miranda Champion, Cameron Alvis, Emily Koehler, Maddison Mcneill*

*Faculty Mentors: David Daberkow*

Introduction: Oxytocin (OXT) is a hormone that has a wide range of central and peripheral effects in mammals. OXT is involved in reproduction and has also been seen to attenuate the effects of stress and anxiety. The purpose of this study was to determine the anxiolytic effects of intranasal OXT administration on the behavioral and physiological signs of fear in mice. Methods: Three groups (n=10, per group) of adult male mice (4-6 month old) were used. One hour before

exposure, OXT was administered intranasally at a dosage of 1.0 µg/kg. OXT (VetOne®) was dissolved in saline (0.9% NaCl) and ~1.3 µl was gently implemented via micropipet into each nostril of the shock+OXT group. The control and shock+saline groups were given an equivalent administration volume of saline. The mice were then placed in a fear conditioning box (Coulbourn Habitest) and allotted a 120s acclimation period followed by 20s of the conditioned stimulus (CS), tone exposure at 2.8kHz delivered by external speaker. A 15s trace interval was used following the CS, followed by the unconditioned stimulus (US), a 0.7 mA scrambled current foot shock for 2s. The mice were exposed to 5 CS-US presentations with an interstimulus period of 10s. One week post fear conditioning, mice were re-exposed to the context and tone. Results: Intranasal OXT reduced levels of fear. In the context re-exposure, the control group froze the least amount of time (0.58% of the total re-exposure time), the shock+saline group froze the most (41%), and the shock+OXT froze an average of 19%. Data analyzed with one-way ANOVA and Tukey's HSD post hoc test indicate a significant difference between the control and shock+saline groups.

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**Intranasal oxytocin increases dopamine signaling in the dorsal striatum of anesthetized rats: Location: Hargreaves Hall, Reading Room - 4A**

*Speakers: Darren Ginder, Christina Ramelow, Mitchell Gainer*

*Faculty Mentors: David Daberkow*

**BACKGROUND:** The neuropeptide oxytocin (OXT), commonly considered the “love hormone”, has been suggested to be involved in many aspects of brain function, such as learning and memory. Current research suggests that, due to the possible modulatory effect of OXT on learning and memory, use of OXT with individuals suffering from post-traumatic stress disorder (PTSD) could be beneficial. Defining the neural mechanisms of OXT is important in order to understand how OXT could potentially be therapeutic for PTSD, and possibly other psychological disorders. The neurotransmitter dopamine (DA) is highly implicated in learning and memory function. DA neurons express OXT receptors and therefore could be a site of OXT action. Using DA analytical methods as a means to compare signals, we proposed that OXT increases DA neurotransmission in the dorsal striatum, a brain region highly innervated with DA neurons. **METHODS:** Male Sprague-Dawley rats (n = 12) were anesthetized and underwent DA electrode placement surgery. DA microelectrodes were placed in the dorsal striatum (coordinates AP= +1.0; ML= +2.0; DV= -4.5) and a bipolar stimulating electrode was incrementally placed above the medial forebrain bundle (coordinates AP=-4.6; ML=+1.4; DV=-7.0), a brain region containing DA neurons that project to the dorsal striatum. Once stable DA signals were recorded, intranasal OXT at 1.0 µg/kg (or an equivalent volume of saline) was administered. **RESULTS:** Intranasal OXT treatment increased DA release, as determined by our analytical method, fast-scan cyclic voltammetry, compared to saline treatment. **CONCLUSIONS:** OXT modulates DA neurotransmission. Due to the role of DA in learning and memory, the role of OXT as a treatment of PTSD may be related to the increase in DA activity that results from OXT exposure. **FUNDING:** Eastern Washington University Department of Biology and David Daberkow Faculty Research Grant (FGRCW 2018-19).

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**Investigating Metallothionein Production and Gene Copy Number as Factors for Increased Heavy Metal Resistance in an Idaho Strain of *Hyaella azteca*: Location: Hargreaves Hall, Reading Room - 5C**



*Speakers: Aleesha Grove*

*Faculty Mentors: Joanna Joyner-Matos*

Several examples of evolutionary adaptation to chemical pollutants have recently been discovered, but we are only beginning to understand potential ecological consequences of these adaptations. *Hyalomma azteca* is a freshwater crustacean and model species for evolutionary toxicology. Due to a legacy of mining, the Coeur d'Alene (CDA) Lake system (ID) is now highly contaminated with trace metals. Despite this, *H. azteca* are commonly found there surviving in metal concentrations typically considered to be toxic. To determine their mechanism of resistance, we compared the expression of the metal sequestering protein metallothionein (MT) and copy number of the MT gene in *H. azteca* from CDA and the laboratory strain (USLab). We designed a metal exposure with zinc and cadmium to induce MT expression in the USLab strain and then compared MT gene expression with CDA *H. azteca* using quantitative reverse transcription PCR. To determine copy number variation in the two strains, we ran PCR on genomic DNA. We found that *H. azteca* from one of the CDA Lakes had significantly elevated MT expression and higher copy numbers of the MT gene than the USLab strain. From these findings we can begin to determine what increased resistance to pollutants can mean for populations and ecological systems.

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**Landslide/Building assessment using drone mounted thermal imaging: Location: Hargreaves Hall, Reading Room - 23**

*Speakers: Ethan Ducken*

*Faculty Mentors: Chad Pritchard*

In April of 2017 a landslide occurred on Porcupine Bay road in Davenport Washington. Construction efforts to repair the damaged road included deposition of excavated spoil on the upper headscarp area. The over steepening of this slope played a major role in the destabilization of the slide area which resulted in a second mass wasting event in October of 2018. The convex width of the slide is roughly 250 feet with a total length of 430 feet from the scarp to the waterline of Lake Roosevelt where the toe of the convex is submerged.

This project focuses on using a drone mounted FLIR-DJI XT2 Zenmuse thermal camera with a goal to produce thermal and 3D maps of the Porcupine Bay Landslide. Thermal mapping should show where groundwater intersect the surface (aka spring water) and other areas that groundwater is perched which could lubricate and/or increase pore-pressure to induce landslides. Initial observations show vertical jointing in the underlying clay where groundwater intersects.

Continued observation using these programs will focus on the interaction of water at these weak points in the clay where continued erosion could further undercut and over steepen the current construction efforts.

3D mapping using small unmanned aerial systems (sUAS, or drones) has become very common in the field of geology, a secondary focus of this project will be to illustrate the practical use of these technologies. Additionally, as sUAS technology are relatively new, building surveys will be conducted using the same thermal imaging to demonstrate the versatility of drone applications.

**Low Vapor Pressure: Location: Hargreaves Hall, Reading Room - 13A**

*Speakers: Michael Mohn*

*Faculty Mentors: Anthony Masiello*

The vapor pressure of chemicals and compounds provide vital information for both industry and environmental researchers. This knowledge is crucial for the proper disposal, detection, storage, and cleanup of many chemicals compounds. There are many ways to collect vapor pressure data such as gas chromatography, combustion analysis, digital pressure gauge as well as others. Most of these methods work well for volatile compounds at ambient temperatures, but fall short in accurately measuring the vapor pressure of low volatility compounds. The purpose of this experiment is to accurately calculate the vapor pressures of ethylene glycol, n-dodecane, and benzyl alcohol at low temperatures using infrared spectroscopy and quantitative infrared reference spectra from the Pacific Northwest National Laboratory.

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**Low-dimensional quantum magnets composed of transition metal sacchrinate complexes: Location: Hargreaves Hall, Reading Room - 12A**

*Speakers: Nicole Etten*

*Faculty Mentors: Jamie Manson*

Under various solvent conditions, powders or single crystals of M(II)-sacch (M = Ni, Cu; sacch = sacchrinate) complexes can be obtained in high yield and in a variety of colors. On occasion, organic ligands such as dicyandiamide or pyrazine have also been used in conjunction with M(II)-sacch to afford new structure types. Many of these systems have been characterized by infrared (IR) spectroscopy and X-ray diffraction to reveal their crystal structures which range from simple molecules to more complex polymers. Preliminary magnetic measurements have been carried out although additional experiments are required to fully understand their behavior. Current progress will be presented.

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**Masking Murder for Profit: the Case of Unilever's Mercury Pollution in Kodaikanal, Indi: Location: Hargreaves Hall, Reading Room - 15A**

*Speakers: Rachel Graham*

*Faculty Mentors: Matthew Anderson*

This study chronicles the commodity chain of mercury thermometers produced by Unilever and, in the process, illuminates the profoundly negative socio-environmental impacts of the manufacturing process. Due to tightening restrictions on mercury in the US and low regulations internationally (URS Dames, and Moore, 2001; Reece, 2000), Unilever bought Chesebrough-Pond's which moved its thermometer production factory from Watertown, New York to the small tourist town of Kodaikanal, India in 1983, in a blatant move to preserve profit margins. Although Unilever has declared that all regulations have been followed on the handling and disposing of mercury, this has been sharply inconsistent with what can best be characterized as a drum-beat of inconsistent testimony from myriad other sources, including many employees who have worked at the factory (Dev, 2015; Jayaraman, 2001; GOI, 2011). Unilever's CEO, Paul Poleman, continues to insist on Unilever's commitment to the environment, despite notable media attention and evidence suggesting otherwise (Ismail, 2015; Ashraf, 2015, URS, Dames and Moore, 2001). In short, more scholarly attention needs to be devoted to this case, to more thoroughly and accurately assess the full extent of the long-lasting

damage levied by Unilever on the environment and residents of Kodaikanal, and finally hold this company (and the many others like it) accountable for so callously sacrificing human life and well-being in pursuit of profit maximization via the production of a thing as seemingly benign as a thermometer. The implications in this case are striking and dire for the vulnerable and marginalized populations that seem to almost inevitably, and disproportionately, bear the brunt of normalized contaminating practices that go relatively unnoticed in the United States by virtue of the extreme geographic separation between consumers and production processes forged by such globally-expansive commodity chains.

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**Mathematical Model of Changes in Inosine Concentrations in the Purine Nucleotide Metabolic Pathway: Location: Hargreaves Hall, Reading Room - 26**

*Speakers: Nathan Blair*

*Faculty Mentors: Nicholas Burgis, Frank Lynch*

Mathematical models are designed based on physical laws and known relationships discovered through experimentation. These models can then be used to predict behavior of physical systems such as neuron firing, chemical equilibrium, and predator-prey systems. This project aims to incorporate methods of mathematical modeling to predict changes in purine metabolism. This will be done by creating a differential equation model to track changes in inosine, and eventually other noncanonical purine concentrations as different pathways are opened or inhibited. A successful model could provide insight into an alternative to supplementing various purine compounds in people whose diseases benefit from them.

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**Modification of Osteoclast Precursor Notch Receptors with CRISPR/Cas9: Location: Hargreaves Hall, Reading Room - 2A**

*Speakers: Samuel Hatfield*

*Faculty Mentors: Jason Ashley*

The Notch receptor protein is a highly conserved transmembrane receptor that plays a role in contact-dependent cellular regulation and differentiation. Normal Notch signaling is required for proper osteoclast maturation and activity. Osteoclasts are responsible for breaking down damaged bone matrix, and are an integral component to the remodeling process that maintains bone in a healthy state. Excessive osteoclast activity, however, can result in progressive bone loss. Better understanding of the signaling pathways that govern osteoclast activity, such as Notch, will create new opportunities for therapeutic manipulation of these pathways. To better understand the role of Notch signaling in osteoclast precursor differentiation, we sought to generate a novel cell line of RAW 264.7 osteoclast precursor cells that possess present but deactivated Notch 1 and 2 membrane bound receptors. We hypothesize that modification of the Notch 1 receptors will lead to an upregulation in osteoclast precursor differentiation and activity, and that Notch 2 modification will lead to downregulation of osteoclast precursor differentiation and activity. Utilizing CRISPR/Cas9 – a prokaryotic RNA-based endonuclease - we removed the intracellular Ankrin 2 binding motif with dsDNA splicing upstream and downstream of the coding region. The intended outcome was to remove the target domain but leave the extracellular portion of the transmembrane Notch receptor in-tact. However, variability in the splicing site and PAM sequences resulted in a frame shift mutation in the Notch 1 cell line and incomplete editing of the Notch 2 cell line. Additionally, it was found that homozygosity was difficult to achieve. While these data may eventually contribute to the overall understanding

of bone physiology along with providing insight into potential bone-preserving therapies, future modifications and refinement of both techniques and work-flow will be required to produce further data.

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**Morphometric changes of body shape in different extant horse breeds through human selection: Location: Hargreaves Hall, Reading Room - 3A**

*Speakers: Emily Spencer, Sarah Kangere*

*Faculty Mentors: Judd Case*

This study explores the evolutionary morphometric changes over time in 4 different categories of horse breeds due to human selection. The categories of horse breeds that were examined include the Quarter Horse, Modern Warmblood, Spanish – of which incorporated the Andalusian and Lipizzan – and the Norwegian Fjord. Each breed of horse was selected based on uniqueness of conformation compared to the ancestral Przeswalski's horse. The primary points of interest were the angles relating to the neck size, shoulder size, and haunch size. The neck size was determined using a triangle method with points at the pole, scapular ridge, and the 5th cervical vertebrae. The point at the 5th cervical vertebrae was the angle that we used to determine neck size. This approach was also used for the shoulder size through determining the angle between the scapular ridge and the front olecranon, and also the haunch size through determining the angle between the croup and patella. The angles were then compared to one another and showed virtually no evidence of neck and haunch size correlation to modern horses versus ancestral horses. The angles proved to depend more so on how the horse is interacting with its environment, and the riding conditions that it is subjected to. There was a significant correlation with the angle of the shoulder between the modern horse breeds. The size of the horse was also used to derive a trend for horse size change in time. This was done using weight and height, and the ratio between both. The ratio of weight to height allowed us to see the general trend of an increase in horse size over the process of selective breeding. We then looked at how the size of the horse compares with the angulation at the shoulder. Surprisingly, this size ratio showed no statistical relation to the angle, whereas the height of the horse did. This suggests that the horse has been bred to be taller, it has also been selectively bred to have a stronger shoulder angulation.

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**Natural compound farnesol reduces T cell infiltration of the CNS in mouse model of Multiple sclerosis: Location: Hargreaves Hall, Reading Room - 8C**

*Speakers: Lacey Sell*

*Faculty Mentors: Javier Ochoa-Repáraz*

Multiple sclerosis (MS) is an autoimmune disease of the central nervous system (CNS) characterized by damage to the myelin sheaths that protect and surround neuronal axons. It is believed that in MS autoreactive lymphocytes that have infiltrated the blood brain barrier entering the parenchyma cause inflammation, demyelination, and the loss of oligodendrocytes' ability to remyelinate. Although there are many drug options on the market, none of them target both inflammation and neurodegeneration simultaneously. Farnesol a 15-carbon acyclic sesquiterpene primary alcohol, may be a potential therapeutic as it has already been shown to have anti-inflammatory effects in vitro, and neuroprotective properties in murine models of neurotoxicity and neurodegeneration. We hypothesized that farnesol would be protective in a mouse model of experimental autoimmune encephalomyelitis (EAE), a widely accepted model for studying MS, as it

displays some of the most prominent features of the human disease. C56BL/6 mice were induced with the disease and treated daily with farnesol or untreated (sham). Since changes in cell subpopulations in the central nervous system may provide clues to the pathogenesis and mechanisms behind MS, the spinal cords from all were collected at the end of the experiment and analyzed by flow cytometry to examine the levels of specific subpopulations of CD3<sup>+</sup> T lymphocytes including regulatory T cells (Tregs). Flow cytometry can analyze these levels by measuring the intensity of fluorescence produced by fluorescently labeled antibodies specific to cell surface antigens or intracellular receptors, both of which help characterize a cell into a specific subpopulation. Our results indicate that farnesol treatment reduced T cell infiltration into the CNS, specifically CD4<sup>+</sup> T cells, cells that have been shown to be increased in CNS of MS mice and human patients. Our lab is now exploring the mechanism(s) by which farnesol reduces T cell infiltration.

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**Nucleophilic Aromatic Substitution of Benzodiazaborole: Location: Hargreaves Hall, Reading Room - 11C**

*Speakers: Abbigail Cox*

*Faculty Mentors: Ashley Lamm*

An important aspect of organic chemistry is synthesizing and creating new compounds. One approach is changing a carbon-carbon double bond to a boron-nitrogen bond in already existing compounds so the bond polarity can change, resulting in altered reactivity. Indole, the molecule of significance to this project, is an abundant and ubiquitous aromatic compound that is a component of biologically important molecules such as: tryptophan, serotonin, melatonin, and more. Chemists have been expanding the chemical space regarding indoles by creating BN indole mimics, and specifically in this project, benzodiazaboroles. This experiment substitutes a nucleophile on the boron, followed by quenching with an electrophile to attach to the nitrogen, resulting in a difunctionalized benzodiazaborole. There is little attention and research regarding benzodiazaboroles, therefore, synthesizing these indole mimics with different chemical properties and reactivity than indole can give chemists more knowledge to create new chemicals to utilize in technologies and pharmaceuticals. The specific reaction conditions, yields, and future directions will be discussed.

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**Optimum Moisture Content and Maximum Dry Unit Weight for Compaction of Interdisciplinary Science Center Soil: Location: Hargreaves Hall, Reading Room - 20**

*Speakers: Rachel Lunstroth, Maria O'Toole, Melissa Simbler*

*Faculty Mentors: Richard Orndorff*

Eastern Washington University's is currently undergoing construction with the addition of the Interdisciplinary Science Center. A soil sample was collected from the construction site and over the course of Fall Quarter 2018 we performed a series of tests on this soil allowing us to classify the soil based on the Unified Soil Classification System. These tests include: a specific gravity determination test according to the American Society for Testing and Materials (ASTM) standard D854, a sieve and hydrometer analysis according to the ASTM standard D422, and an Atterberg limits test according to the ASTM standard D-4318. We also performed a compaction test according to the ASTM standard D698 in which we determined the soils optimum water content, the maximum dry unit weight, and the allowable range for water content for compaction. We found that the optimum water content for compaction is 16.5%.

**Pesticide Residues in Honey Bees and their Effects on the Gut Microbiome: Location: Hargreaves Hall, Reading Room - 10C**

*Speakers: Daniel Franzese*

*Faculty Mentors: Jenifer Walke*

In the global ecosystem, honey bees (*Apis mellifera*) serve the significant role of pollinators, maintaining food security and ecosystem health throughout the world. The population of honey bees worldwide has seen drastic decline since 2006 when colony collapse disorder (CCD) became prominent. Accordingly, honey bees are threatened by a variety of factors, including poor nutrition, parasites and pathogens, and exposure to pesticides. Contemporary studies serve to examine the degree, if present, of the influence of pesticides in this ubiquitous population deterioration as the potential adverse effects of these pesticides are poorly understood. We seek to understand 1) how widespread pesticide residues are in honey bees, and 2) whether the honey bee gut microbiome is impacted by pesticide exposure, and if so, whether it may serve as a mechanism by which honey bees deal with these possible toxicity risks. Accordingly, we tested bees from 24 hives among five sites across eastern Washington using HPLC-MS for the presence and concentration of six commonly used agricultural pesticides; Carbaryl, Chlorpyrifos, Coumaphos, Cypermethrin, Imidacloprid, and tau-Fluvalinate. Carbaryl was not detected in our sampled bees. However, the remaining five pesticides were found in the following percentages across all hives sampled: Imidacloprid (41.7%), Cypermethrin (41.7%), tau-Fluvalinate (12.5%), Chlorpyrifos (4.2%), and Coumaphos (4.2%). The prevalence of hives with detectable pesticides, and to some extent the concentration of pesticide residues in the bees, varied across the different sites. Future work will characterize the honey bee gut microbiome to test whether it is correlated with pesticide concentrations in the bees. There is potential for some microbes to mitigate conceivable negative effects of the pesticide exposure on overall honey bee health, therefore theoretically safeguarding their role as crucial pollinators in the environment.

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**Preliminary Characterization of Lysine 89 ITPase Mutant: Location: Hargreaves Hall, Reading Room - 11B**

*Speakers: Dean Ownbey*

*Faculty Mentors: Nicholas Burgis*

Inosine triphosphate pyrophosphohydrolase (ITPase) is an enzyme that hydrolyzes inosine triphosphate (ITP) and other noncanonical nucleoside triphosphates. This process prevents these noncanonical bases from being incorporated into the DNA. Lack of ITPase or function loss mutation, leads to rapid mutation of DNA due to an increase in noncanonical base accumulation, which can result in death. Research has shown that the 89th amino acid, lysine, plays an important role in catalysis by coordination of transition metals located around the enzyme's active site. By replacing this lysine with alanine (K89A), we plan to test enzyme kinetics to determine the importance of lysine in the protein. The plasmid containing the mutation for K89A is currently being constructed. Once construction is confirmed, the plasmid will be transformed into *E. coli* cells to produce workable amounts of the ITPase mutant protein K89A. Using high performance liquid chromatography (HPLC), the reaction of the enzyme with ITP can be measured to determine the enzyme kinetics. With previous research having shown the importance of the lysine in coordination of active site transition metals, we hypothesize that the mutant K89A will be less effective at hydrolyzing ITP than the wild type ITPase.

**Quantitative characterization and size scaling of bone histological features between human and non-human mammalian bone.: Location: Hargreaves Hall, Reading Room - 3B**

*Speakers: Jaqulynn Haines*

*Faculty Mentors: Judd Case*

A quantitative characterization of both osteons and Haversian canals, which are structures that result from bone remodeling and that both are seen in histological sections of mammalian bone can reveal differences between taxa and between body size or parts. Size scaling of these histological bone features appears to occur relative to the thickness of the cortical bone in and between non-human mammalian (NHM) and human bone. Are differences in these structures in regard to overall size of osteon, Haversian canal size and lamella diameter of NHM bone and human bone the result of scaling factors or phylogeny. Previous qualitative descriptions of these structures have been offered without any quantitative data or analyses have not been on non-human mammals and a quantitative examination has only rarely been performed on human bone. Bone slides from various biological companies which contained both calcified and decalcified bone were examined under 10x magnification. A variety of measurements were made on both osteons and Haversian canal structures to the nearest 0.01 mm in crosses-section. The collected data, were statistically analyzed through regression analysis, ANOVA and t-Tests with the following results: 1) there is significant difference between human osteon area and NHM osteon area; 2) there is a significant difference between Haversian canal size between human bone and NHM bone; 3) human rib sections were more similar to NHM bone in osteon area than were human femur sections but, there was still a significant difference in Haversian canal size in that the NHM had smaller structures; and 4) human femora were significantly larger in all structures compared to human rib sections. Thus, overall human bone structures are significantly larger than NHM bone structures but there is a question of whether these size variabilities in structure are due to a scaling factor or phylogeny.

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**Relaxed Mental State Detection using the Emotive Epoc and Adaptive Threshold Algorithms: Location: Hargreaves Hall, Reading Room - 13C**

*Speakers: Olin Anderson*

*Faculty Mentors: Paul Schimpf*

The electroencephalogram (EEG) has proven to be useful in a wide variety of applications, including: diagnosis of mental disorders, psychological research, neurofeedback, and brain computer interfacing. Most such applications of the EEG benefit from an ability to automatically detect when the subject is in a relaxed state. Recently, inexpensive and relatively easy to use EEG systems, with multiple electrodes, have become available at prices comparable to cellular phones, or game machines. This project's purpose is to investigate the feasibility of real-time classification of a subject's relaxation state using one such consumer-grade EEG system, the Emotiv Epoc. The subject's state is classified as relaxed or not relaxed by monitoring the EEG signals over his or her occipital brain region and monitoring alpha wave activity. Said activity is characterized using an adaptive subject-specific threshold algorithm. Different variations of the threshold algorithm were investigated and their performance was compared using receiver operating characteristics graphs.

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**Removal of Surface Sialic Acid Impairs Osteoclast Differentiation: Location: Hargreaves Hall, Reading Room - 1B**

20<sup>TH</sup> ANNIVERSARY  
EWU RESEARCH & CREATIVE WORKS SYMPOSIUM

*Speakers: Charles Johnson*  
*Faculty Mentors: Jason Ashley*

The nature of extracellular surface glycosylation patterns has been shown to have a variety of effects on cells during their life cycle and developmental outcomes. Past studies have shown that terminal sialic acid, or neuraminic acid, has a discernable effect on the differentiation of osteoclasts. Our preliminary research and analysis has shown that polypeptide N-acetylgalactosaminyltransferase, GALNT, expression is down regulated in osteoclast from male mice compared to those from females. GALNT is responsible for attaching N-acetyl-D-Galactosamine or GalNAc to the serine/threonine substrates which is key to the development of glycation patterns that terminate with sialic acid. We hypothesize that sex-dependent glycosylation patterns drive variation in differentiation outcomes. The purpose of the experiment was to assess potential differences in osteoclast maturation between the two sexes with regards to the removal of terminal sialic acid residues. Osteoclast precursors were harvested from the leg bones of a male and female mice and treated with macrophage colony-stimulating factor (MCSF) and receptor activator of nuclear factor kappa B ligand (RANKL) to stimulate osteoclast differentiation. After two days of treatment, cells were either maintained in culture medium with MCSF and RANKL alone or supplemented with neuraminidase, which cleaves terminal sialic acid residues. At the conclusion of the differentiation period, the neuraminidase treated cells appeared much smaller than controls and appeared to be arrested at immature stages of differentiation. These results indicate that the terminal sialic acid groups of these glycation patterns are necessary for differentiation to occur, but there were no discernable differences between sexes with regards to differentiation as all of the samples showed a pronounced inhibition of differentiation. These outcomes indicate that the terminal sialic acid groups do have a pronounced effect on the differentiation of osteoclast

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**Selecting Seed Provenance for Palouse Prairie Restoration: Location: Hargreaves Hall, Reading Room - 2C**

*Speakers: Ethan Bean*  
*Faculty Mentors: Rebecca Brown*

The Palouse Prairie is a threatened ecosystem that once stretched 16,000 km<sup>2</sup>, but is now limited to less than 1 percent of its original range. Eastern Washington University (EWU) owns a 155-acre wheat field adjacent to campus. This field will be converted to native Palouse Prairie habitat to restore ecosystem functions and services. An important component of a restored habitat is the genetic make-up of the established plant populations; too little genetic variation will cause founder effects, and maladapted genotypes may prevent successful reintroduction of the species. Selection of native species, seed sources, and genotypes will play an integral role in the final appearance and overall health and functionality of the restored prairie. *Pseudoroegneria spicata* is a bunchgrass that is commonly used to restore native prairie because its long roots make it drought tolerant and able to outcompete invasive weeds. For this reason, *P. spicata* will be used in the EWU prairie restoration project. The goal of my project is to analyze the genetics of local populations of *P. spicata* and identify relatedness and potential problems caused by small size of populations surrounding Cheney, WA. To aid in selection of appropriately sourced propagules, I will be sampling *P. spicata* from local remnant prairies that were never converted to agriculture. Additionally, I will sample plants grown from seed purchased at local native plant nurseries. DNA will be isolated from these samples using the DNEasy Plant Mini Kit (Qiagen, Germantown, MD, USA), amplified, and



sequenced using restriction-site associated DNA sequencing (RADSeq). The DNA will be analyzed to find how closely related nearby populations are using Bayesian clustering in STRUCTURE Ver 2.3.4, and complications due to small population size will be identified by calculating the fixation index (FST) in R. These data will allow us to better select the propagule source for EWU's Palouse Prairie restoration.

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**Synthesis of 2D and 3D Inorganic Coordination Networks with Unique and Unusual Electronic and Magnetic Properties: Location: Hargreaves Hall, Reading Room - 6A**

*Speakers: Nathan Blair*

*Faculty Mentors: Eric Abbey, Jamie Manson*

In a collaborative project between the Abbey and Manson labs, organic and inorganic synthetic methods are used to synthesize commercially unavailable heterocyclic pi-conjugated ligands used for the creation of 2D and 3D inorganic coordination networks with unique electron spin and magnetic properties. N-heterocyclic carbene and bipyridine compounds have been synthesized and coordinated to first row transition metal ion centers. This collaboration seeks to understand how the ligands influence electronic and magnetic properties of these networks.

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**The Response of Western Sword Fern to Precipitation and Climate Variation in Washington: Location: Hargreaves Hall, Reading Room - 28**

*Speakers: Jenny Harrington*

*Faculty Mentors: Ruth Kirkpatrick*

The purpose of this project was to analyze three years of morphological field data for Western sword fern and compare these data to annual precipitation for five populations distributed across Washington state. Western sword fern (*Polystichum munitum* (Kaulf.) C. Presl) is a dominant understory species in temperate coniferous forests from Alaska to California, and can be found across Washington. Fern Watch scientists have found that individual sword ferns respond quickly to annual precipitation variation by growing more and larger fronds in wetter years and smaller and fewer fronds in drier years, thus making sword fern an important indicator for climate change in forest habitats. Results suggest that sword fern frond size, frond number, and population density are strongly correlated to seasonal variation in precipitation and climate patterns across Washington.

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**Unconfined Compressive Strength of the Soil Underlying the New Interdisciplinary Science Center Building: Location: Hargreaves Hall, Reading Room - 19**

*Speakers: Richard Souders*

*Faculty Mentors: Richard Orndorff*

The compressive strength of soil fundamentally controls its ability to support infrastructure loads. The new Interdisciplinary Science Center (ISC) at Eastern Washington University (EWU) is currently being constructed. To better understand its properties and to classify it according to the Unified Soil Classification System, we utilized technical testing standards that were developed and published by the American Society for Testing and Materials (ASTM) to determine the specific gravity (ASTM D-854), particle size distribution (ASTM D-422), and Atterberg limits (ASTM D-

4318) of ISC soil. We then tested the unconfined compressive strength of ISC soil according to ASTM 2166. We altered compactive effort and the resulting unit weight to test the impact of compactive effort on ultimate strength. The results of the modified unconfined compressive strength test showed an ultimate strength of 3136 pounds per square foot (psf) at 15 blows/lift, 4053 psf at 25 blows/lift, and 4242 psf at 35 blows/lift.

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**X-ray Acoustic Computer Tomography (XACT) as new imaging technique to reduce radiation dose and improve image quality: Location: Hargreaves Hall, Reading Room - 14C**

*Speakers: Abdullah Alabdulmohsin, Anna Gudima*

*Faculty Mentors: Ali Zarafshani*

Medical imaging is the technique and process of producing image of the body's recognizable structure or a function for determining a diagnosis and/or treatment regimen. The introduction of advanced imaging modalities has tremendously improved the outcome and quality of medical care accessible to patients based on availability of clinical features. Over the years, various biomedical imaging modalities, which apply different techniques, have been developed, i.e. X-ray imaging, CT, MRI, US, Optical and electric/magnetic Tomography's. The most important valuable features for medical imaging modalities are based on invasive or non-invasive procedure, safety or minimum side effect of its use, sensitivity and specificity, distinguish ability, cost along the clinical pathway, rapid data collection, reliability, and reproducibility. These factors allow physicians and scientists to find better ways to prevent, make increasingly accurate diagnoses, to render precise clinical information and measured modes of treatment. In this research, we focused on the development of a new imaging technique based on X-ray Acoustic Computed Tomography. This new imaging technique has potential of tomographic imaging, e.g. for the breast screening application using a custom-designed breast XACT scanner. This imaging technique has potential to be replace instead of current screening modalities such as mammography screening. In this technique multiple-element 3-D ultrasound transducer arrays could be used to catch the acoustic signal generated from a single pulsed X-ray source. 3-D X-ray absorption contrast imaging can be obtained even if just by using one short X-ray pulse around 60 ns on the patient. This research impact is based on that this technique can reduce by a factor of 1000 the radiation dose, and image 100 times faster when compared to the conventional X-ray CT or mammography screening, while maintaining high image resolution and image contrast. It has the potential to revolutionize X

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**'Tis the Season: A study on the Seasonal Variance of Altruistic Behaviors: Location: Hargreaves Hall, Reading Room - 4C**

*Speakers: Greysen Danae*

*Faculty Mentors: Mark Holmgren*

The purpose of this study is to discover which point in the year individuals behave with the highest levels of altruism. This is accomplished by using data collected through classroom experiments during different points in the year among different class levels. OLS regression techniques are then employed to estimate the coefficients for each season. The results indicate that generosity among students occurs at the highest level during the winter quarter. These results are also

compared to previous studies regarding altruism and loss aversion. The implication of the results suggests optimal fundraising may occur in the January-March time period.

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**18 Year Old Female Collegiate Volleyball Player with Impaction Fracture of Talus: Location: Hargreaves Hall, Reading Room - 12B**

*Speakers: Tyler Hollmann, Mckenna Patrick*

*Faculty Mentors: John Gerber*

The talus bone forms the primary connection between the lower leg and foot and is vital for mobility. Injuring this area will affect the motion and function of the ankle joint. Athlete injured ankle while getting off a bus, but symptoms did not arise until a week later. The original worry was further injury the wrist as she had a sprained at the time. The athlete in this case study is a 18 year old female volleyball player who first presented symptoms in October 2018 a week after her fall, she developed pain with walking and was put into a boot. Symptoms persisted after continued rest throughout the week, but showed no swelling, edema, or ecchymosis. X-rays came back negative and the next thought was os trigonum, because of no obvious fracture. An MRI revealed an impaction fracture of the talus, a result in overuse of the ankle. The purpose of the case report is to describe the anatomy of ankle and the signs and symptoms pertaining to this condition. Also, the surgical procedure and rehabilitation used will be discussed. Providing a case report on this condition will assist athletic trainers become more knowledgeable and aware of a condition they may encounter in their profession.

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**18-year-old Female Division 1 Volleyball Player with Nerve Damage Post ACL & MCL Surgery: Location: Hargreaves Hall, Reading Room - 13A**

*Speakers: Inga Erickson, Harli Spurgeon*

*Faculty Mentors: John Gerber*

Nerve damage is one unpleasant complication post-surgery. After anterior cruciate ligament (ACL surgery, one of the common complications is damage to the infrapatellar branch of the saphenous nerve (IPBSN) (Walshaw, Karuppiah, Stewart, 2014). The athlete in this case study is an 18-year-old female volleyball player who tore her ACL and medial collateral ligament (MCL) on September 17, 2018 jumping to hit the volleyball. Once tests confirmed the ACL injury, the patient completed rehabilitation for 2 weeks and then had surgery to repair the ACL and MCL. After the surgery, it became obvious that there was a complication of a nerve injury. Symptoms of nerve damage still are present to athlete causing discomfort and lack of sleep due to pain. The purpose of the case report is to describe the important anatomy associated with this condition along with the signs and symptoms this athlete experienced. Also, the surgical procedure and rehabilitation used will be discussed. Providing this case report will assist athletic trainers become more knowledgeable and aware of a condition they may encounter in their profession.

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**18-year-old with a Superior Labral Tear: Location: Hargreaves Hall, Reading Room - 13B**

*Speakers: Sarah Bailey*

*Faculty Mentors: John Gerber*

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The labrum is a rim of cartilage that is shaped like a cup that reinforces the ball and socket joint of the shoulder complex. The labrum sits in between the glenoid and the head of the humerus, the labrum contributes to shoulder stability as it is the attachment site for the ligaments in the shoulder along with supporting the ball and socket joint along with the rotator cuff tendons and muscles. When the labrum is torn this usually results in deep aching pain and difficulty performing certain movements with the shoulder (Fealy, 2010). The athlete in this case study is an 18-year-old female track athlete who is a freshman and presented her symptoms to us when she came to Eastern September 2018. She states that these symptoms have gone on since she was in middle school and she has seen multiple doctors for the pain, but none of them would call for an MRI so they never diagnosed her. When she arrived to Eastern, she was ordered an X-Ray and an MRI, which showed a posterior tear in her labrum. As of right now she will not get surgery until after the outdoor season of 2019, so we are continuing pain management methods, so she can run at the best of her ability with the least amount of pain. The purpose of the case report is to describe the anatomy of the shoulder complex and the signs and symptoms pertaining to this condition. Also, the surgical procedure that will eventually occur and rehabilitation used will be discussed. Providing a case report on this condition will assist athletic trainers become more knowledgeable and aware of a condition they may encounter in their profession.

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**19 Year Old Female Division I Collegiate Basketball Player with Bilateral Knee Debridement: A Case Report:  
Location: Hargreaves Hall, Reading Room - 13C**

*Speakers: Claudia Rodwell, Shawn Semb*

*Faculty Mentors: John Gerber*

A debridement is a surgical procedure in which unhealthy tissues are removed from the body. This procedure is also called arthroscopy or simply “scoping the knee (or other joint),” (Eustice et. al, 2018). Typically, the unhealthy tissues are removed because they are harmful, and removal can aid in healing (Winchester Hospital, 2008). The athlete in this case study is a 19-year-old female basketball player who has chronic knee pain. An MRI revealed that the athlete had an extra band of fibers in her knees, bone growth on her patellae, and frayed patellar tendons. Because of this, the athlete was advised to get a debridement surgery in both knees to remove these extra structures and frayed parts of her tendons. Each knee surgery was done at separate times, two weeks apart, to allow time for the first surgery to begin healing. Both surgeries took place in August 2018. Since then, the athlete has started a rehabilitation program. The purpose of this case report is to describe a debridement of knees and the rehabilitation and treatment protocols following surgery. The anatomical structures involved and complications following surgery will also be discussed. Providing a case report on this procedure will assist athletic trainers in becoming more knowledgeable about a procedure they may find in their clinical experience.

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**19 Year Old Female with Patella Femoral Pain & Diabetes: Location: Hargreaves Hall, Reading Room - 12C**

*Speakers: Lowell Kovacich*

*Faculty Mentors: John Gerber*

Patellofemoral pain syndrome is a condition in which the cartilage under the kneecap is damaged due to injury or overuse. This is one of the most common causes of knee pain, especially in the female population (Scali, K., Roberts, J.,

McFarland, M., Marino, K., & Murray, L. 2018). The Athlete in this Case study is a 21 Year Old Division I Female Volleyball Player who was diagnosed with patella femoral pain syndrome. She also has diabetes which might be a complicating factor. This episode of knee pain occurred on September 25th, 2018 more than a year after her last complaint of knee pain. Upon further evaluation it was found she had improper tracking of her patella. On Oct 20, she came out of a game because of the pain in her knee that was causing her a great deal of pain. It is very difficult to cure or at least significantly decrease symptoms of patellar femoral pain syndrome while the athlete is in season and continuously using his or her knee. The purpose of this study is to describe the anatomy of the patella femoral joint and signs and symptoms of this injury. We will also explore complicating effects of diabetes with this condition. In addition, the rehabilitation will be explored. Providing this case study will assist athletic trainers in becoming more knowledgeable and aware of a condition they will definitely encounter in their profession.

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**A report on generating social marketing messages from the results of a cross-sectional study in an effort to reduce single-use plastic among college students.: Location: Hargreaves Hall, Reading Room - 17**

*Speakers: Sarah Olson, McKayla Elliott*

*Faculty Mentors: Sarah Mount*

**Background:** Social Marketing is the use of marketing principles to design programs that assist intentional behavior change to support improve personal or societal well-being. The creation of a well-focused social marketing campaign should be based on research that identifies the factors, such as knowledge and attitudes, that impact behavior. Identifying these factors helps health promoters create messages for the greatest impact. A study was conducted at a large regional university to identify these factors among college students. The principles of designing a social marketing campaign was then applied using the 4 P's of marketing (product, place, price, promotion). **The Purpose:** The purpose of this report is to illustrate how social marketing principles can be applied to study results to generate effective behavior change messages. **Methods:** The cross-sectional study results we focus on was a survey designed to identify knowledge, awareness, attitudes, perceived barriers, and frequency of plastic bag use among students at a large regional university. The results were analyzed for descriptive statistics using SPSS. The messages were then generated and shared on different social media platforms such as Facebook and Twitter, as well as other unexpected and unconventional locations, according to the fundamentals of social marketing. This report will illustrate the process, challenges, and successes of applying research to practice.

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**Althea Gibson: Tennis Extraordinaire: Location: Hargreaves Hall, Reading Room - 14B**

*Speakers: Reilly Responde*

*Faculty Mentors: Chadron Hazelbaker*

This poster explores five published articles that have researched the life and impact of Althea Gibson on competitive tennis and how she influenced the social reformation of desegregation which surrounded amateur tennis in the 1950's. The resources all report similarly about the impacts Gibson had but all focus on different time points and aspects of her life. Authors Macguire and Schwartz comment on the barriers she broke down while also including sections of her overall impact on the inspiration for change in allowing African Americans to compete in competitive sports. On the other hand,

Miller and Gibson report on the simple statistics and physical achievements she had obtained throughout her career. The final author, Amdur, links Althea Gibson's impact on tennis to how it allowed athletes of the future to compete without dissent. This poster examines all of the authors research while reporting on the life of Althea Gibson and how she achieved physical as well as social milestones for the African American community by breaking down the walls of segregation surrounding amateur tennis in the 1950's.

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**Alzheimers, Dementia, and resilience: Location: Hargreaves Hall, Reading Room - 9A**

*Speakers: Nichole Zeober*

*Faculty Mentors: Rie Kobayashi*

Research for the poster was gathered from the Alzheimer's Regional Conference: Discovery 2019, which was focused on living life with Alzheimer's and or dementia, and resilience. While attending the Alzheimer and Dementia conference I sat in on workshops named: Negotiating Choice and Risk: A Relational Approach, Dementia Stigma: Public and Personal, and Meeting Dementia Head On: The Dementia Action Collaborative (Panel). The panel included speakers named Lunne Lorte (MPH), Bob LeRoy, Maureen Linehan, Kristoffer Rhoads (PhD), and Cheryl Townsend Winter, (DDS, MSD, MBA). The speaker for the first two workshops mentioned was led by G. Allen Power, whom was also the keynote speaker of the conference. The focus of research includes measures, tools, and resources implemented by the Dementia Action Collaborative (DAC), the Washington State Plan to Address Alzheimer's Disease and other Dementias, along with future plans for the Dementia Action Collaborative (DAC) and proposed funding request to the state legislature. The initiatives include: A dissemination of dementia care best practices to primary care practitioners, a expansion of public information and education using evidence-based public health messaging around brain health, the warning signs of dementia and the value of early diagnosis, promoting early legal and advance care planning, and the development of dementia care specialist program and direct services. The second focus is on arbitrating choice and risk involving people living with dementia. Showing how stigma and an overrepresentation of safety can be harmful to ones' well being, along with ways to reexamine risk and negotiation to increase well-being and quality of life. The third focus includes the hurdles people living with dementia experience in all aspects of life. An alternative model will be discussed that helps combat stigma and offers a future filled with hope and direction for people.

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**Analysis of Helicobacter pylori sRNA-cagII and sRNA-cagIII and Identification of Genes they Regulate: Location: Hargreaves Hall, Reading Room - 14C**

*Speakers: Brandon Flatgard*

*Faculty Mentors: Andrea Castillo*

Helicobacter pylori is a common gram-negative bacterium infecting roughly 50% of the human population. All H. pylori infections result in inflammation of the gastric epithelium, but only 10-15% of infections are symptomatic and progress to severe gastric diseases such as gastric and duodenal ulcers and gastric cancer. Different disease outcomes are due in part to genetic variations among H. pylori strains. Infection is thus relatively common, yet disease is relegated to a subset of individuals with varying degrees of severity. H. pylori strains with a genomic region called the cytotoxin-associated pathogenicity island (cagPAI) are associated with increased risk of severe disease. The cagPAI region encodes a type IV

secretion systems which enables induction of bacterial molecules into the host gastric epithelial cell. In bacteria, these pathogenicity islands typically carry one or more virulence factors, and when missing, the bacterium will usually become nonpathogenic. Other studies involving other bacteria have found that sRNAs play a role in gene regulation. Found in all kingdoms of life, sRNAs are post-transcriptional regulators. These transcripts are 50-300 nucleotides in length and act independently on expressed targets. Interactions serve to regulate and fine-tune gene expression by interacting with target mRNA molecules to inhibit or accelerate gene translation or function. Understanding how *cagPAI* genes are regulated is key to understanding how they promote disease. A recent study found three sRNAs located in *cagPAI*: sRNA-cagI, sRNA-cagII, and sRNA-cagIII. My goal is to identify *cagPAI* genes regulated by sRNA-cagII and sRNA-cagIII. Though computer analysis of these sRNA sequences, I identified a set of genes they potentially regulate. To determine if these genes are in fact targets of sRNA-cagII and sRNA-cagIII, I will use a GFP gene expression reporter system. These experiments will inform how gene regulation in *cagPAI* intersects with *H. pylori* virulence.

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**Are You The One in Three?: Location: Hargreaves Hall, Reading Room - 1B**

*Speakers: Angelina Chesakov, Carly Bates, Corrine Dalhaus, Vera Parks*

*Faculty Mentors: Rosalee Allan*

Methicillin Resistant Staphylococcus Aureus (MRSA), a common type of hospital-acquired infection (HAI), results in an increase in the total cost of care by tens of thousands of dollars. It was also found that as a result of hospital-acquired infections, the average length of a hospital stays increases. The majority of hospital patients are completely unaware of both direct, and indirect costs that a hospital stay may bring. The U.S. Department of Health and Human Services has reported that while measures are being taken to reduce the spread of MRSA, there has not been a significant decrease in the rate of acquired infections.

Ample data is available through peer-reviewed literature and census reports of Washington State hospitals. Information presented in this research paper will provide evidence-based insight into the transmission and negation of MRSA throughout Washington State. The purpose of this study is to present a thorough analysis of statistical data gathered in reference to our research topic. The subject matter under analysis is the transmittal and prevention on MRSA in Washington State Hospitals. This study is intended to provide an overview of proper protection practices to combat hospital acquired Methicillin Resistant Staphylococcus Aureus (MRSA) in Washington State.

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**Assessment of the Verbal Behavior and Milestones Assessment and Placement Program: Location: Hargreaves Hall, Reading Room - 21**

*Speakers: Erika Glunz*

*Faculty Mentors: Jessica Urschel*

In this paper, I explore the content, administration, and the psychometric soundness of the VB-MAPP. Used to assess for deficits in verbal communication in children with Autism Spectrum Disorder (ASD) and other developmental disabilities, the Verbal Behavior and Milestones Assessments and Placement Program (VB-MAPP) is based on the core principals presented in Skinner's analysis of verbal behavior (Barnes, Mellor, & Rehfeldt, 2014, Dixon et al., 2015, Mason et al., 2018, Montallana, Gard, Lotfizadeh, & Poling, 2019, Sundberg and Michael, 2001). Not only an assessment tool, the VB-

MAPP also identifies potential barriers to learning and aids in the creation of Individual Education Plan (IEP) goals. While commonly used to help direct the treatment of ASD, the reliability and validity of the VB-MAPP is still being evaluated (Dixon et al., 2015, Mason, 2018, Montallana, 2019) and one study noted that training for those implementing this assessment is inadequate (Barnes et al., 2014). \_x000D\_

Keywords: VB-MAPP, autism spectrum disorder, verbal behavior, language assessment

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**Communication Through the Arts for People Living with Dementia: Location: Hargreaves Hall, Reading Room - 8C**

*Speakers: Anne Howard*

*Faculty Mentors: Rie Kobayashi*

With the number of older adults rising in the United States, the number of people living with dementia is rising as well. As dementia progresses, many clients experience reduced communication and language skills, among other symptoms. As a result of this loss of function, loved ones, friends, caregivers, and others face challenges when trying to communicate with people with dementia, and innovative strategies are needed. This poster will discuss current communication strategies used with people with Alzheimer's or dementia, with a particular focus on art as a communication strategy. Communication strategies identified will include those used between people with Alzheimer's or dementia and either the families of people with Alzheimer's or dementia or their assisting social workers. Further discussion will include best practices for the use of arts communication.

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**Comparison of power production indices during seated and standing Wingate anaerobic tests in young adults : Location: Hargreaves Hall, Reading Room - 20**

*Speakers: Caleb Overturf, Jeff Ford, Hannah Ewert, Brandon Smith, Chuy Garcia, Brandon Wilbert*

*Faculty Mentors: Katrina Taylor*

The Wingate anaerobic test (WAnT) is a common assessment of anaerobic capacity in athletes and the general population. Many individuals request to stand during the WAnT in an effort to generate greater power; however, currently there is a lack of research to suggest a standing position is beneficial to performance. PURPOSE: To compare peak power production during a WAnT in the seated and standing position in young adults. METHODS: Thirteen college-aged individuals volunteered for the study. A within-subjects, crossed-over design was utilized. Participants were randomized to one of two conditions (seated or standing) during their first visit. The WAnT involved a 30-second all-out cycle test against a 7.5% of body weight resistance in either the seated position or standing. A minimum of 48 hours separated each testing session. Peak and mean power production (Watts; W) were calculated, as well as rate of fatigue index  $[(\text{peak power} - \text{least power})/\text{peak}] * 100$ , energy production (Joules) and rotational speed (revolutions per minute; rpm). Data were analyzed using paired samples t-tests with an alpha level set at 0.05. RESULTS: There were no differences in peak power production ( $p=0.96$ ) between the seated ( $731.3 \pm 175.3$  W) and standing ( $732.8 \pm 174.5$  W) conditions. Further, there were no significant differences in mean power output ( $p=0.13$ ), fatigue index ( $p=0.13$ ), energy production ( $p=0.22$ ) or number of revolutions per minute ( $p=0.52$ ) between the two conditions. CONCLUSIONS: Our findings suggest that position on the bike, i.e., seated versus standing, does not impact indices of power production during the WAnT in young



adults. Therefore, fitness professionals and coaching staff should allow individuals to self-select the position they feel most comfortable with for the WAnT. Future research would be beneficial to confirm these findings in a larger, more heterogenous sample of athlete and non-athletes.

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**Creating Dementia-Friendly Community- A Culture Shift Using Techniques By Dr. Al Power: Location: Hargreaves Hall, Reading Room - 8A**

*Speakers: Ahna Soli*

*Faculty Mentors: Rie Kobayashi*

A Culture Change Presentation about Creating Dementia Friendly Communities that support residents who are affected by Dementia remaining integrated in their community through supports and community trainings. According to the Dementia Action Collaborative of Washington State, over 100,000 people live with Dementia's or Alzheimer's in Washington with that number continuing to grow. Our society and culture is not equipped with the tools to help them lead productive, purposeful lives. Currently, the population affected by Dementia is placed in institutional care communities where they are considered safe and well taken care of. Using the behavior strategies and culture change tools presented by Al Power at the Regional Alzheimer's Association Convention, the community will learn how to empower a person through trust, dignity and respect. Reducing stigma around Dementia creates safe inclusive communities where people can live to their fullest potential within their home community. The information will be presented in a literature review format so as to highlight specific aspects of the approaches outlined by Dr. Al Power As a person shifts the way they experience the world, the world can shift how they experience the person.

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**Defining Success in Service-Learning: Location: Hargreaves Hall, Reading Room - 7A**

*Speakers: Vikram Gill*

*Faculty Mentors: Teena Carnegie*

Service-learning allows students to interact with and support their local community while advancing necessary skills in their given field, in this case, Technical Communication. The potential benefits of service-learning include work experience for students, a dynamic and untraditional teaching experience for instructors, and the community partners gain as much, if not more, than they would from traditional, non-learning community service. However, these benefits are often incremental. For example, the community partners may only gain the additional human resources of working with students and possible exposure for their brand. Any larger or long-term goals may not be met in the short time students are required to work with community partners for their learning programs.

In my experience with a service-learning project, I saw many of these benefits firsthand. However, the larger goal in working with my group's community partner was to secure them a grant by writing a proposal. By the end of the course, our completed grant proposal had failed to net any potential investors for our community partner. Ultimately, my group members and I received the experience of working with a community partner and engaging in community service, but the partner organization did not secure a grant via our participation. This is not an unusual experience, as grant proposals, whether from professionals or students, rarely result in successful funding. This begs the question: does success matter in service-learning opportunities? Alternatively, does the student's learning experience take precedence over the service

provided? In this presentation, I will detail my service-learning experience in the context of the challenge faced in reaching our community partner's ultimate goal of receiving a grant, discussing both the losses and benefits of the partnership from both perspectives.

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**Division I Female Soccer player with Type I Chiari Malformation: Location: Hargreaves Hall, Reading Room - 4A**

*Speakers: Tyler Daigneault*  
*Faculty Mentors: John Gerber*

Arnold Chiari Malformation Type 1 is when brain tissue extends into the spinal canal. It happens when part of the skull is misshapen and it presses on the brain forcing the cerebellum outward (Mayo Clinic 2018). Forceful contact with this part of the brain can cause prolonged concussion like symptoms if a concussion is indicated. This condition is hereditary and can be improved with surgery. The concussion is atypical due to the nature of Chiari malfunction. The athlete in this case study is a 19-year-old female soccer player that presented concussion like symptoms on September 7, 2018. The symptoms persisted over one month and increased with modified activity, so an MRI was taken to determine if a pathology other than concussion was evident. Inner ear damage was seen in the semi-circular canals which seemed to be part of the cause for her prolonged symptoms. While she still has occasional symptoms of inner ear damage, concussion symptoms have resolved. This athlete has been cleared to play as tolerated. The purpose of this study is to inform people of what Chiari Malformation is, potential issues related to playing a contact sport like soccer, and potential treatment options.

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**Effect of Static Hip Flexor Stretching on Standing Pelvic Tilt and Lumbar Lordosis: Location: Hargreaves Hall, Reading Room - 10B**

*Speakers: Samantha Baker, Sebastian Lopez, Benjamin Adams, Zach Eagle*  
*Faculty Mentors: Jeni McNeal*

**PURPOSE:** The purpose of this study is to see if an acute bout of static stretching of anterior hip muscles results in a change in sagittal pelvic and lumbar position during standing. Adult participants (18-40yrs) will be asked to stand with arms overhead, aligning their body as vertically straight as possible. To assess lumbar and pelvic position, reflective markers will be placed on vertebral levels T7, T12, and L4, as well as the anterior superior iliac spine (ASIS), posterior superior iliac spine (PSIS), and the greater trochanter of the femur. Photographic images of the straight-standing position will be taken before, and following a stretching intervention for the anterior hip musculature. The stretching intervention will consist of a half-kneeling forward lunge position, performed for 30 sec each leg for three repetitions each. Freeware (ICMeasure) will be used to digitize the reflective markers and calculate lumbar lordosis and pelvic tilt. Two paired t-tests (SPSS v.24) will be used to determine if significant differences occur in lumbar lordosis and pelvic tilt before and after the intervention. **RESULTS:** There is a significant difference ( $t=.002, p<.05$ ) between the pre and post stretch of the LUMp angle with a reduction of the angle indicative of increasing posterior pelvic tilt. The PTC and LUMm angles were not statistically significant, the results however are practically significant.

**Effective Communication in Service Learning: Location: Hargreaves Hall, Reading Room - 5C**

*Speakers: Phillip Smelser*

*Faculty Mentors: Teena Carnegie*

Service learning is a vital part of any academic program. At EWU it is defined as “a teaching strategy that integrates course content with relevant community service.” (sites.ewu.edu/2019) The intent of a service-learning project is for students to work with a community partner to identify and find solutions for a problem or need. One key component of this process is effective communication. Unfortunately, this is a significant challenge and most projects suffer due to unsuccessful communication methods. Through my participation in a grant writing course, I was able to see the positive results of effective communication. Our team and the community partner implemented a weekly meeting held at the partner’s main office. The weekly meetings allowed us time to learn more about the community partner’s current program and the need that the proposal would address. We also were able to fully understand what resources the community partner needed to successfully implement the project. This deeper understanding allowed us to quickly identify and research available resources to meet the budgeting, scheduling, marketing and planning needs of the project. With successful completion of our grant proposal project, we exemplified the best practices for effective communication with a community partner. For the presentation of the project, I will discuss the project tasks, requirements and deliverables. Next, I will focus on discussing the methods we used to effectively communicate with the community partner. Finally, I will describe challenges we faced and how we overcame them.

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**Effects of a Tactile Safeness Intervention on Experiences of Shame and Compassion: Location: Hargreaves Hall, Reading Room - 18**

*Speakers: Jamie Baum, Dana Billena*

*Faculty Mentors: Russell Kolts*

Previous research has shown that tactile attachment interventions are able to mitigate experiences of social threat and facilitate compassionate and altruistic responding. Building off of those findings, this study examines the effects of touching an inanimate object with soothing physical features - a teddy bear- upon felt experiences of shame and compassion after the induction of a shame memory. Participants from Eastern Washington University will be randomly assigned to one of two conditions- holding a teddy bear or a water bottle, and will be instructed to notice the physical features of the object (how it feels, etc.) as a part of a fictitious marketing study. Participants will then be prompted to think of a time they have experienced shame and will write for three minutes about their shameful experience. Following the writing procedure, participants will complete measures assessing their experiences of shame, self-compassion, fears of compassion, and psychological flexibility. We hypothesize that students in the teddy bear condition will report higher levels of psychological flexibility, self compassion, and experience lower levels of shame compared to individuals in the water bottle control condition. The ultimate goal of the study is to explore ways that tactile interventions can play a role in mitigating experiences of shame and threat, particularly in individuals who, perhaps related to their attachment histories, struggle to feel soothed/safe in through connection with other people.

**Effects of restoration techniques on wetland macroinvertebrate abundance and diversity in and around Turnbull National Wildlife Refuge: Location: Hargreaves Hall, Reading Room - 11C**

*Speakers: Dechen Edwards*

*Faculty Mentors: Joanna Joyner-Matos*

Wetlands provide habitat for a variety of plants and animals and play essential roles in nutrient and water cycling. Historically, a large percentage of wetlands were drained to repurpose the land. We are working with Turnbull National Wildlife Refuge staff to explore the effects of different restoration techniques on macroinvertebrate biodiversity in recently restored Eastern Washington wetlands. We hypothesized that a) reference wetlands (never repurposed) would have the highest macroinvertebrate diversity and abundance when compared to wetlands restored by excavation or by flooding without excavation, and that b) excavated wetlands would have higher macroinvertebrate diversity and abundance than flooded wetlands. In 11 wetlands in and around the refuge, we took monthly (April-Sept 2018) samples of macroinvertebrates from two sites, where plant matter was submerged or emergent. Macroinvertebrates were sorted, counted, and identified to class or order. We used ANOVA's to evaluate two metrics, the abundance (number of invertebrates/sampling) and the diversity (number of taxa/sampling). Invertebrate abundance per sample ranged from 0-401, and number of taxa collected per sample ranged from 0-12. Invertebrate abundance was significantly higher in flooded wetlands than in excavated ones in May ( $p > 0.034$ ). There was no significant effect of restoration type on invertebrate abundance in any other month ( $p > 0.797$ ). Using a linear regression, we found a significant relationship between diversity and abundance in June ( $p > 0.044$ ), but no other month. Across all wetland types and sites, the most abundant taxa were mayflies (Ephemeropteroidea), midges (Chironomidae), and freshwater snails (Hydrophilia). Our lack of patterns reflect the variation across the wetland types and could be affected by the presence of invasive predatory species in some samples. These results suggest that both restoration techniques are equally effective at restoring macroinvertebrate communities.

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**Effects of Video Games as Stress Reliever Between College Majors: Location: Hargreaves Hall, Reading Room - 15C**

*Speakers: Elizabeth Olson, Stephanie Preston, Emma Bayuk, Abigail Brayman*

*Faculty Mentors: Heidi Hillman*

Video games have been a hotly debated issue in psychology since their introduction as a mainstream recreational activity. Questions have arisen as to whether they are detrimental or beneficial to the human psyche. In exploring the research, we found that there can be a positive relationship between video games, stress relief, and emotional effect. For example, studies range in topics from the effects of video gameplay and stress on military veterans (Carras et al., 2018), to recover from stressful situations in day-to-day activities (Reinecke, 2009). Our study examined a previously unexplored relationship between academic major and video games used as a stress reliever. Our results showed that 52% of college students found video games as an effective stress reliever, however, only 19% of college students believed video games was a beneficial use of time. In addition, undeclared students reported the highest video game usage whereas the students majoring in business reported the lowest video games usage.

**Engineering Lactococcus Lactis as an Alternative Treatment for Multiple Sclerosis: Location: Hargreaves Hall, Reading Room - 3A**

*Speakers: Marcos Monteiro*

*Faculty Mentors: Andrea Castillo, Javier Ochoa-Reparaz*

Multiple Sclerosis (MS) is an autoimmune disease characterized by destruction of the myelin sheath in the central nervous system (CNS) and is likely due to both genetic and environmental influence. It was discovered recently that MS patients have lower concentrations of the neurotransmitter  $\gamma$ -aminobutyric acid (GABA) in their serum, brain and intestines, than healthy individuals. Lower levels of GABA are associated with physical impairments in MS patients. The lactic acid bacteria (LAB), commonly used in probiotics, produce GABA by the enzymatic action of glutamic acid decarboxylase (GAD) on L-Glutamate (Glu). Our goal is to engineer the LAB bacterium, Lactococcus lactis to produce high levels of GABA. To accomplish our goal, we will incorporate additional highly expressed copies of the genes gadB and gadC that encode GAD and the GABA antiport protein, respectively, into the genome of L. lactis. In order to add those genes in the genome of L. lactis., we will construct a plasmid with the genes gadB and gadC. The plasmid will be introduced into L. lactis by electrophoresis and integrated chromosomally at the leuA locus, which is non-essential to the bacterium. Then, we will evaluate the expression of GadB and GadC by Western Blot and level of GABA by ELISA. In future experiments, we will test the engineered strain as a therapeutic probiotic in MS mice model system.

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**Factors in Graduation of EWU Students: Location: Hargreaves Hall, Reading Room - 10C**

*Speakers: Aaron Hope*

*Faculty Mentors: Krisztian Magori*

Factors that determine graduation rate have not been quantified to date, even in light of dwindling graduation and retention rates among every year of student from freshmen to grad students. I have used the boosted regression tree modeling technique to assess the relative influence of all academic factors tracked by our internal records, and have proven the efficacy of the model in predicting graduation outcomes given internal records. Gaps in the accuracy of the model exist, which requires large sweeping changes in information gathering and privacy laws, specifically requesting employment status, distance from the school, and behavioral health trends in order to fill those gaps. This observational study gives direction for future investments in EWU students to improve graduation outcomes, but does not offer causal relationships due to the nature of the study. It also highlights known errors in our record keeping. There are two recommendations that I offer to improve graduations rates, both of which require an expenditure of labor hours and permissions, but could potentially improve the graduation and retention rates at EWU by 10%.

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**Family Financial Stressors on Latinx Students: Location: Hargreaves Hall, Reading Room - 1A**

*Speakers: Marixza Torres*

*Faculty Mentors: Theresa Martin*

As students emerge into higher education traditional customs of family responsibly, support and respect shape their future educational and career aspirations. Although these values have helped European and East Asian students persist in their academic endeavors, students from Latinx background report substandard grades compared to their counterparts.

Economic and social capital play a role in the conditions that affect a student's achievement despite their academic motivation. Previous studies have explored the differences in ethnic family responsibility's and how they affect high school student's academic achievement. In this investigation, using five measures the aim of this study is to 1) assess the relationship between college students' socio-economic background and the financial assistance to their family. 2) assess attitudes towards their current or future financial assistance. 3) explore how it affects their educational adjustment.

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**Feasibility of X-ray induced Acoustic Signals to measure the proportional radiation does during clinical radiotherapy: Location: Hargreaves Hall, Reading Room - 26**

*Speakers: Anna Gudima, Abdullah Alabdulmohsin*

*Faculty Mentors: Ali Zarafshani*

New, complex radiotherapy delivery techniques require dosimeters that are able to measure complex three-dimensional dose distributions accurately and with good spatial resolution. Dosimetry is the act of measuring or estimating radiation doses and assigning those doses to individuals to optimize treatment strategies during the radiotherapy. In- vivo radiation dosimetry monitoring is essential to measure the actual dose received in and around the target tissue during radiotherapy treatment. Advances in radiation detectors and specialized treatment techniques have fuelled the need for better and suitable detectors and techniques. Many types of techniques have been used in small fields and cross compared with others. Three-dimensional conformal radiation therapy (3DCRT) is now firmly in place as the standard of practice in clinics around the world. A new treatment modality referred to as image-guided IMRT (IG-IMRT), or simply image-guided radiation therapy (IGRT). A unique X-ray-induced acoustic computed tomography (XACT) system that combines the advantages of high X-ray imaging contrast and high ultrasonic spatial resolution. The feasibility of induced acoustic signals aiming to measure the X-ray dose proportional to X-ray absorption in three dimensions (3D) during radiotherapy. A prototype X-ray induced acoustic signals using nano-second pulse X-ray source, single channel ultrasound transducer, and data acquisition system including high frequency amplifiers. The Result of using k-Wave MATLAB toolbox for the simulation and reconstruction of X-ray induced acoustic signals have demonstrated the feasibility of the X-ray induced acoustic signals in monitoring the 3D acoustic signals with high sensitivity and high accuracy for the dosimetry measurement applicable for the radiotherapy clinical applications.

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**Grandparents as Kinship Care Providers : Location: Hargreaves Hall, Reading Room - 27**

*Speakers: Carissa Shaw*

*Faculty Mentors: Daniel Ruddell*

Today in America, more than seven million children are being raised by relatives – especially grandparents. This is referred to as Kinship Care. When birth parents choose not to care for their own children, or become unable to provide a safe loving home - for any number of reasons including drug addiction or incarceration, then family members often step in to care for the child to prevent them from living in the foster care system.

However, kinship care can present difficult challenges to relatives with limited incomes, such as grandparents living on social security. Additionally, older relatives may have health issues that make caring for a young child difficult. And often times, due to the difficult and unexpected circumstances that lead to children being removed from their birth parents' care,

children and grandparents face greater mental health and social challenges than those in the general population. My research will focus upon grandparents providing kinship care to their grandchildren. I will research the financial costs and social impacts of kinship care upon the household. I will also look at the physical health and mental health stresses placed upon grandparents as primary care providers. Finally I will share information on the new supports and resources available to grandparents providing kinship care in Washington State. These new resources are designed to help grandparents navigate complex government systems, thus improving access to critical supportive services for them and for their kinship children.

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**Homelessness within Spokane- how can we make a difference?: Location: Hargreaves Hall, Reading Room - 9B**

*Speakers: Jenne DeLeon, Suhail Alghamdi, Zahra Alhamili, Natalie Fiallos*

*Faculty Mentors: Rosalee Allan*

Generally speaking vagrancy numbers were up 11 percent amid the yearly Point-in-Time Tally, a governmentally commanded include of destitute in Spokane, Washington that happened on January 16, 2019. Increments were recorded among veterans (15 percent), constantly destitute (73 percent) and unaccompanied youth (20 percent). These increases in the homeless are stretching resources and creating a need for more community-based treatment facilities, especially during times of disease outbreaks. \_x000D\_

One of the key lodging help assets in Spokane, Washington is the Catholic Philanthropies managed Destitute Families Facilitated Evaluation program. The program is subsidized by gifts and is kept running in conjunction with other non-profits and foundations, including Spokane's People group, Lodging and Human Administrations Office. \_x000D\_

The purpose of this study is to present a systematic review of the available evidence based literature concerning limited resources and the lack of community-based treatment facilities. \_x000D\_

It is hoped this study will inform the public about the serious homelessness affects we face today, and how we can make a difference.

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**Increasing Female Student Enrollment in K-12 STEM Programs: Location: Hargreaves Hall, Reading Room - 29**

*Speakers: Aaron Howe*

*Faculty Mentors: Daniel Ruddell*

Modern social progress has allowed for more women to pursue traditionally masculine careers in areas like medicine. Despite this, many science, technology, engineering and mathematics (STEM) fields continue to be dominated by males both in the educational setting and in post-graduate occupations. Schools have begun to introduce female students to these career options through extracurricular activities and classroom engagement as early as their K-6 elementary education, but these attempts by education systems are not always evaluated for effectiveness. During the 2017 academic year, Spokane Public Schools (SPS) attempted to increase the number of female students in their summer STEM camp. They used direct marketing techniques to increase female enrollment, and told teachers and other STEM specialists in the school district to encourage their female students to sign up. The goal was to increase female enrollment to 50%, making the number of female and male students equal. To evaluate the effectiveness of the program, data from the 2017 camp session was

collected regarding female student participation. That data was compared directly to the rosters from the year before to determine if SPS's methods had worked. The comparison showed that female student enrollment had increased significantly, with on average 40% of students being female in 2017 as compared to the 32% female enrollment in 2015. This is accompanied by a staggering increase in overall student attendance from 500 to 2,772. An 8% increase shows significant success in the initiative to increase female enrollment, and the same marketing methods may be used in the future to continue increasing participation of female students.

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**Is Hospital Price Transparency Resulting in Medical Tourism?: Location: Hargreaves Hall, Reading Room - 2B**

*Speakers: McKenzie Kooch, Erin Codd, Brooke Henderson, Kameron McCardell*

*Faculty Mentors: Rosalee Allan*

The Healthcare Financial Management Association defines price transparency as "Readily available information on the price of healthcare services that, together with other information, helps define the value of those services and enables patients and other care purchasers to identify, compare, and choose providers that offer the desired level of value." Both state and federal entities are working to incorporate price transparency in our healthcare system, encouraging providers to be held accountable for fair price-setting. Prices for the same health care services can vary substantially depending on the provider. Going to more expensive providers does not necessarily mean they deliver higher-quality care. It can be nearly impossible for consumers to get enough information to compare providers based on both price and quality, or to get accurate estimates of how much they will have to pay before they receive the bill. Due to the change in accessible healthcare, the same service can have drastically different costs with different providers, causing individuals to seek services outside of the United States. Literature exists regarding the rise of medical tourism, although not all address the link between medical tourism and price transparency. In order to better show this link, the authors have tried to gather the findings of research articles. The purpose of this study is to inform providers and patients about the prevalence of medical tourism as a result of price transparency in the United States.

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**Long Term Care Benefits for Aging American Veterans: Location: Hargreaves Hall, Reading Room - 28**

*Speakers: Claudette Becker*

*Faculty Mentors: Daniel Ruddell*

The provision of long term medical care in America is very expensive. This is particularly true for our aging military veterans. However, veterans receiving a pension through the Veteran's Administration (VA) may be eligible to receive a monthly stipend to help cover the expenses for long term custodial care. Eligible veterans and their survivors could benefit from this stipend in any living arrangement/environment, i.e., private home, assisted living, or skilled nursing / retirement facility.

My research will define VA pension eligibility criteria. I will also research and describe the parameters of eligibility for these long term care medical benefits. Lastly, I will look at and share the financial impact these benefits have upon our senior military veterans.



My research will conclude with a guide that explains how military veterans and their families can access (apply for) these long term care benefits to help improve their quality of life as they enter their senior years.

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**Lung cancer survivors who continue smoking after diagnosis are more likely to be living with an individual who smokes: Location: Hargreaves Hall, Reading Room - 3C**

*Speakers: Sue Treppenhauer, Amy Stine*

*Faculty Mentors: Kevin Criswell*

**Introduction:** In the United States, lung cancer is the leading cause of cancer death in both men and women. Smoking increases the risk for lung cancer, and smoking cessation after diagnosis improves cancer survival and lowers rates of recurrence. Using the Theory of Planned Behavior (TPB), we examined individual attitudes, perceived control, and subjective norms as predictors of lung cancer survivors' intention to quit smoking.

**Method:** We conducted a secondary data analysis to examine attitudes, perceived control, and subjective norms of smoking in a sample of lung cancer survivors (N = 171). Analyses were limited to those with a smoking history (i.e., former (n = 139) and current smokers (n = 32)). While logistic regression modeling was considered, unequal subsample sizes ((n = 139 and n = 32) biased results. Chi-square goodness-of-fit tests and independent-samples t-tests were utilized to examine how group differences in smoking history predict theory-related factors of intention to quit smoking (i.e., individual attitudes, perceived control, and subjective norms).

**Results:** When compared to former smokers, we found that significantly more current smokers reported living with an individual who smokes regularly,  $p < .05$ . Other predictors and demographic variables were not significantly associated with smoking status (former vs. current),  $p$ 's  $> .05$ .

**Conclusions:** Some lung cancer survivors may find it difficult to quit smoking due to subjective norms that encourage smoking at home. Indeed, living with someone who smokes regularly may decrease an individual's intention to quit smoking. Smoking cessation programs that incorporate significant others and close relationships may be more effective than those that focus exclusively on patients who continue to smoke. Further longitudinal research is needed to support our findings and identify other risk factors for continuing to smoke after lung cancer diagnosis.

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**Maximizing Our Professional Potential: Location: Hargreaves Hall, Reading Room - 8B**

*Speakers: Susanne Wimberley*

*Faculty Mentors: Rie Kobayashi*

As professionals working with the aging population, it's important to be humble about our profession itself. There is always more to learn, and this poster was developed after attending two lectures from Jonathan Prescott, at the Discovery Conference in Seattle, WA. Addition relevant research, on both listening and boundaries, was acquired from a variety of sources, including academic journals. In serving clients, the art of listening is one of the most valuable skills we can possess. It is the basis of establishing rapport. This poster will address the different ways we can be present when listening to the aging population talk about their journey. Equally important, especially with the stories and moments that we get to witness, is being able to maintain healthy boundaries. We all know that not maintaining healthy boundaries can quickly

lead to burnout, from a job you may love very much and a population that could really benefit from having caring professionals in their life. This poster is geared towards maximizing our potential and serving those we care about.

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**Meet My Needs First: Non Pharmacological Interventions: Location: Hargreaves Hall, Reading Room - 7B**

*Speakers: Holly Buche*

*Faculty Mentors: Rie Kobayashi*

I had the opportunity to attend the Discovery 2019 Alzheimer's Regional Conference and was particularly interested in the topic of non-pharmacological approaches in treating Alzheimer's and other Dementia's. It often weighs heavily on my mind the knowledge that psychotropic medications are contraindicated in aging adults. The burning question then is what else can we do?

Inspired by my work experience I have chosen to research and share on this topic. I work in a Skilled Nursing Facility that includes short and long-term care as well as a memory care unit. It has been my experience the Nursing Home is held to a very high standard by CMS to decrease the use of Psychotropic Medications. I wonder about the overuse or inappropriate use in the community. In my poster I will share some statistics from literature review and share ideas for non-pharmacological interventions. Research on this topic could help inform policy makers to consider not only regulating the use of psychotropic medications in older adults in primary care but also ensuring there are sufficient resources to support aging adults in their environments.

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**Modernization doctrine: Through oil exploration and It's impact in the Niger, Delta, Nigeria: Location: Hargreaves Hall, Reading Room - 11B**

*Speakers: Malachi Chukwu*

*Faculty Mentors: Dorothy Zeisler-Vralsted*

This research focuses on modernization as a doctrine, and the effect of this ideology upon water development in Niger Delta, Nigeria. While the manipulation of water has been practiced since ancient time, including the Egyptians and Chinese civilization, the scale of manipulation has changed. As a global phenomenon, modern development benefits states around the world. Most states are inclined to use modernization as a strategy to improve citizen's lives. Modernization brings about diverse infrastructures, technology, and employment to communities, which makes life simpler and increases citizen life expectancy. Even though modernization significantly offers upward mobility, there are challenges that may lead to social and environmental issues. Social issues include families losing their lands, which creates food insecurity within these communities. Also, there ARE environmental issues from pollution such as the mass oil drilling that occurred in the NIGER DELTA. The Ogoni community, in particular, in Niger Delta experienced the impact of oil drilling. For the OGONI, the benefit of modernizing communities and development was promised; however, that was not the case with the effect of oil drilling in the region over three decades. For example, the Ogoni people have no access to a quality community health center. Furthermore, these communities lack potable drinking water, which was the case prior to oil exploration. Additionally, this phenomenon is not limited to only the third world countries. Indigenous communities IN western countries have also been subjected to similar treatments. For example, with the construction of the GRAND COULEE DAM, the Colville Tribes' lands were taken from them without formal compensations until a few

decades ago when they were compensated. Other examples include the North Dakota access pipeline protest proving that advanced countries allow these practices of choosing modernization over citizens welfare.

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**Orange You Glad You Were Wearing Blue?!: Location: Hargreaves Hall, Reading Room - 16**

*Speakers: Kaela Holm, Justin Dunfee, Danielle Ramos*

*Faculty Mentors: Heidi Hillman*

There are many studies that focus on color and one's mood as well as studies on how appearance can affect how people view others. Previous studies discuss how one's appearance can affect the likelihood of one's willingness to approach you. The purpose of our study was to evaluate whether the color of someone's shirt had an effect on the willingness of others to help them. Our results showed that the color blue was the highest ranked and the color orange was the lowest ranked when participants were asked, would you be willing to help this person.

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**Parental Rearing Styles, Child Abuse, Borderline Personality Traits, and Suicide: Location: Hargreaves Hall, Reading Room - 24**

*Speakers: Max Barham, Rachel Overland, Emma Wasser, Annika Rauch, Jacqueline Adams*

*Faculty Mentors: William Williams*

Borderline Personality Disorder (BPD) is characterized by extreme emotional lability, interpersonal problems, self-harm, and attempted suicide (Linehan, 1993). Linehan's biosocial model of BPD provides a framework for investigating vulnerabilities that stress the role of invalidating early environments, e.g., excessive criticism, erratic responses, and over-involvement (Crowell, Beauchaine, & Linehan, 2009). Most research has focused on the effects of invalidation attributable to childhood maltreatment (Bandelow et al., 2005). Another potential contributor to invalidation is parental rearing styles, but this factor has received less attention, though an interesting finding reported by Nickel et al (2002) suggests that parental rearing may be a greater contributor to BPD etiology than maltreatment. Our objective is to explore the relative contributions of parental rearing and childhood maltreatment to the development of BPD, and symptoms such as self-harm, and suicide ideation. The participants were 242 undergraduate women. Parental rearing style was assessed using the Swedish s-EMBU (Arrindell et al., 1999). The subscales of the s-EMBU are: overprotection, rejection and emotional warmth. BPD traits were evaluated using Borderline Symptom List (BSL-23: Bohus et al., 2009). Suicidal ideation was assessed using the Beck Scale for Suicidal Ideation (BSSI: Beck, 1991), and self-harm was assessed using the Self-Harm Inventory (SHI: Sansone, et al, 2010). The psychological variables of BPD, self-harm and suicide ideation positively correlated with each other, as expected. As predicted, parental rejection and overprotection were positively correlated with these variables, but parental emotional warmth was negatively associated with these same variables. Childhood physical abuse, psychological abuse, sexual abuse, neglect and witness to violence were positively correlated with the psychological variables as well as parental rearing, excepting emotional warmth.

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**Positive Bias in Positive Psychology: Location: Hargreaves Hall, Reading Room - 22**

*Speakers: Brandy Hutton, Max Barham*

*Faculty Mentors: Philip Watkins*

As the positive psychology movement has began to ramp up, many self-report measures have been created to research positive emotions such as gratitude, joy, and humility. While these measurements have been beneficial in giving researchers a baseline understanding into positive emotions, they are also explicit which presents the problem of self-presentation bias. We tend to view ourselves in a positive light and therefore rate ourselves more positively on self-reports. The purpose of this study was to investigate the distribution skew of commonly used positive self-report measurements for possible negative skew. We ran frequency distributions and calculated the skew of multiple measures used in five separate studies (N=900). Five measurements had a significant negative skew indicating a large proportion of participants scored the maximum or close to the maximum score on these measures: the Gratitude Questionnaire (GQ-6, skew -5 to -10), Gratitude, Resentment, and Appreciation Test (GRAT, skew -3 to -5), Gratitude Adjectives Scale (GAS, skew -3 to -5), Gratitude to God Test (GTG-T skew -2 to -3), and the Satisfaction with Life Scale (SWLS, skew -2 to -3). These results suggest that positive bias is an important issue in positive psychology that must be considered. We suggest controlling for self-presentation bias when analyzing results from these measure or implicit measures when available.

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**Quality Senior Living: Location: Hargreaves Hall, Reading Room - 7C**

*Speakers: Jessica Kinney, Ashley Hansen*

*Faculty Mentors: Rie Kobayashi*

The focus of our research and presentation is on improving the quality of living for our society's aging population in Senior Living Facilities. Our research will be centered on the issues of abuse, neglect and exploitation within these facilities. Many of our seniors living in these facilities are vulnerable adults who are not receiving the quality of care in which they deserve. In our research, we will also be looking at programs like the Long-Term Care Ombudsman's Programs (LTCOP) throughout the country. The goal of LTCOPs is to advocate for the residents, staff and family of the residents living in facilities. Through the program, Ombudsmen are able to see and hear first hand the experiences of those living in Senior Living Facilities. We will be using literature reviews and meta-analysis to determine the rates in which these issues are happening and finding solutions to advocate for change. Using our results, we will discuss implications for our findings and suggest ideas that will help create positive change and better quality Senior Living Facilities for our elderly.

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**Relationship Between Vaccination Hesitation and Measles Outbreak in the U.S.: Location: Hargreaves Hall, Reading Room - 10A**

*Speakers: Maria Larios, Courtney Boles, Lidize Deleon, Katherine Woods*

*Faculty Mentors: Rosalee Allan*

Measles is an infectious viral condition that is highly contagious and affects unvaccinated children the most. It was thought that measles had been eliminated from the U.S.; however, due to sufficient numbers of unvaccinated individuals in the U.S., multiple outbreaks have occurred. Since then, the U.S. has taken initiative to promote vaccination in children, in efforts to combat the outbreaks. In our research we explored the reasons for the hesitation surrounding vaccines and the effects it is having on the public health of the U.S.

**Relationship Between Vaccination Hesitation and Measles Outbreak in the U.S.: Location: Hargreaves Hall, Reading Room - 9C**

*Speakers: Maria Larios, Katherine Woods, Courtney Boles, Lidize Deleon*

*Faculty Mentors: Rosalee Allan*

There has been a continuous amount of measles outbreaks that have surfaced in the United States, even though the disease was thought to be eliminated (Bester, 2016). The cause for the measles outbreaks in the U.S. is attributed to the high numbers of unvaccinated individuals since 2010 (Measles Cases and Outbreaks, 2019) (Thompson & Kisjes, 2016). The measles is a serious disease that affects all age groups; however, children younger than five years old are more likely to suffer from measles complications (Measles Cases and Outbreaks, 2019). The research method for the analysis of ongoing measles outbreaks nationwide are comprised of qualitative and quantitative data. The qualitative and quantitative data utilized was derived from secondary peer reviewed data sources. Healthcare professionals, through a common consensus, have attempted to educate the public on the important role vaccines play in public health; however, there still exists uncertainty amongst numerous parents and individuals on whether to vaccinate children or not (Cacciatore, Nowak, & Evans, 2016). Due to the significant impact the U.S. has experienced from the recent measles outbreaks and with healthcare professionals vouching for vaccines, it becomes a question as to what is causing the vaccine hesitation and what is being done to eliminate the hesitance. There are many factors attributed to the uncertainty surrounding vaccinations. As a result of the recent outbreaks throughout the country, multiple states are taking additional precautionary measures to reduce the amount of vaccine exemptions granted (Jones, Salmon, Omer, 2018). These outbreaks have led to multiple conversations about vaccinations and what needs to be done to contain the issue. The reasons behind vaccination hesitancy and what actions are being executed to increase the number of vaccinations administered in the U.S. are explored.

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**Service Learning and Professional Accountability: Location: Hargreaves Hall, Reading Room - 6B**

*Speakers: Brandon Munson*

*Faculty Mentors: Teena Carnegie*

Service learning is a course-based service experience that allows the students to participate in an organized service activity in such a way as to gain further understanding of course content, a broader appreciation of the discipline, and enhanced sense of civic responsibility (Bringle and Hatcher 1995). Blending the academic and professional environments creates a space where students can apply learned skills readily in real-world tasks and projects. In this space, students also encounter new responsibilities as professionals to their service-learning partner: from producing quality deliverables or service work, to developing a professional working relationship with their service-learning partner. Professional accountability is one of the larger aspects of service learning that is understated and is incredibly valuable to students in transitioning from the academic environment to the professional world. Understanding how to build and maintain professional relationships with effective communication, as well as holding oneself to a standard of professional accountability is not easily taught in the classroom setting. The experience of working with a third-party, non-educationally affiliated group serves to provide the students with realistic professional interactions. I discovered this quality of service learning through my own experience in working with a local non-profit for the TCOM 407 Grant

Proposal Writing course. Service learning bridges the gap between students and professionals by offering organizations a chance to work with students as they would a hired employee. In this poster, I will detail my experience with the Grant Proposal Writing service-learning project and address the levels of professional accountability students achieve through service learning, exemplifying the benefits service learning has for students transitioning out of academia.

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**Service Learning for Students on Campus: Location: Hargreaves Hall, Reading Room - 2C**

*Speakers: Madeline Le*

*Faculty Mentors: Teena Carnegie*

Service learning gives students the opportunity to connect and learn about their school's community while applying skills learned from courses through a student's academic career. Service learning supports students to develop a greater sense of interpersonal development, particularly the ability to work well with others, and develop communication and leadership skills while creating a strong relationship with the institution and faculty (Bandy). Service learning in technical communication classes help students build a strong relationship with their community while learning the process of completing a feasibility report. A feasibility report is a document that assesses potential solutions for a problem based on research and data. Institutions have many needs, including being able to provide different services. For example, Eastern Washington University's Career Services was pondering the idea of implementing a peer mentor program for their office. But due to Career Services' heavy workload, they were unable to conduct the research and gather information to determine whether or not a peer mentor program was feasible for them. This became the focus of our service learning project and gave us the opportunity to work with Career Services and collaborate as a team. In this presentation, I will be describing the service-learning project, creating a feasibility report for Eastern Washington University's Career Services and developing a greater sense of interpersonal development.

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**Service Learning: Location: Hargreaves Hall, Reading Room - 5B**

*Speakers: Mayra Zuniga Sanchez*

*Faculty Mentors: Teena Carnegie*

Service learning is applying course content objectives and applying them to community-based activities and collaborating with a community partner. Service learning has many benefits for students and the community. Students develop skills of civic engagement and having the ability to build connections with professionals, as well as build leadership skills and cognitive development.

Service learning is different compared to the traditional classroom setting where students listen to the instructor and do assignments that only cover the course. Service learning involves personal, social and career development, but it is commonly overlooked by institutions because of time constraints, group conflicts, and the inability of finding community partners willing to participate.

As part of this presentation, I will present on how service learning enhanced my learning experience as a Technical Communication Major with the community partner Teen & Kid Closet. My group and I were giving the opportunity to work with them and create a grant proposal for them.

**Service-Learning & Ensuring Usability in a University Setting: Location: Hargreaves Hall, Reading Room - 6C**

*Speakers: Timothy Linton*

*Faculty Mentors: Teena Carnegie*

Service-learning as defined by EWU Office of Community Engagement is a teaching strategy that integrates course content with relevant community experience. Students in studies by Eyler & Giles (1999), Astin et al. (2000), and Eyler et al. (2001) regularly work harder and learn more in service-learning than in traditionally taught classes. Service-learning also focuses on needs in the community being met, which gives weight to the work of the students. A significance which is missing from average classwork. Technical communication uses service learning to give students real world grounding in the field and to see how grant writing, usability, and instruction contribute to the community.

Most universities have faculty and students from abroad who are often ESL speakers and may struggle with forms and documentation. This issue is magnified by complicated layout and word-heavy design of the many forms used for scholarships, class registration, and other applications. Usability testing is an important step in the creation of any documentation. These tests help writers and designers ensure that an audience is able to quickly understand the requirements of the form and that the form is not a hindrance to their success. In this presentation will describe the process of designing a usability test, and how these practices, if implemented for university document creation, can improve access to education for students from all cultures. I will use a service-learning project I completed in Winter 2017 to demonstrate the potential for university document improvement through usability testing. I will also show how concepts like increased readability and simplified layout can enhance the experience of filling out forms and applications.

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**Service-learning: Effectively Transitioning Students Into the Workplace: Location: Hargreaves Hall, Reading Room - 6A**

*Speakers: Rachel Bean*

*Faculty Mentors: Teena Carnegie*

Service-learning is a method of learning that is meant to integrate the needs of the community with the academic curriculum of the students. This method allows for the work of the students, emerging professionals, to be used outside of the school, serving as a test of the skills that students may have only used in a school setting. Students are assigned the task of completing a project for a community organization who is without the resources to complete the project. Matching students who need experience with community organizations who are in need of professional services is an effective method of easing the student's transition from a school setting into the workplace.

Obtaining a job, even with a degree, is not a simple task. In order to obtain a job, you must have skills, proof of skills, and social connections. By providing students with an opportunity to do service-learning, they are able to improve all three of these requirements.

My poster will share my experiences with service-learning. At EWU, I have worked with iFixit, a company that creates repair manuals, and with Teen & Kid Closet, a local organization that provides foster youth and youth experiencing homelessness with clothes. The projects completed for these two organizations have provided me with skills, proof of skills, and social connections helping me to comfortably transition into the workplace.

**SKILLED NURSING FACILITY 911 CALLS/ EMERGENCY ROOM VISITS AND SOLUTIONS FOR REDUCTION: Location: Hargreaves Hall, Reading Room - 1C**

*Speakers: John Gannon, Christopher Davis, Nathan Main*

*Faculty Mentors: Rosalee Allan*

Emergency room visits are a costly occurrence to both the skilled nursing facility and its patients. Emergency calls predominantly occur within the nursing facility due to COPD, sepsis, congestive heart failure and behavioral health issues. Each event may result in negative financial and personal impacts on the skilled nursing facility and its patients.

A year's worth of skilled nursing facility data capturing these trends will be statistically analyzed and conclusions will be drawn. The synthesis of several research articles will concurrently occur to provide additional insight and support

The purpose of this study is to reduce the number of emergency room calls and visits of patients from nursing homes by 50%. This will be accomplished by evaluating the impacts on patients, skilled nursing facilities and hospitals, as well as understanding the causal implications of why the emergency room visits occur within elderly care facilities. Evaluation of direct and indirect costs to the skilled nursing facility, the patients and the hospital will be analyzed. It is hoped that this research will help inform skilled nursing facilities of the main causes of 911 and ER visits as well as possible ways to reduce those occurrences and decrease costs to skilled nursing facility and its patients.

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**Symptom burden and time since diagnosis are associated with quitting smoking in lung cancer survivors:**

**Location: Hargreaves Hall, Reading Room - 3B**

*Speakers: Amy Stine, Sue Treppenhauer*

*Faculty Mentors: Kevin Criswell*

**Introduction:** Lung cancer is the leading cause of cancer-related mortality in the U.S. Quitting smoking after diagnosis has been associated with better survival. Using the Health Belief Model (HBM) as a framework, we examined perceived susceptibility/severity of illness, perceived benefits of and barriers to quitting, and cues to quit smoking as predictors of whether lung cancer survivors quit smoking. **Method:** We conducted a secondary data analysis of lung cancer survivors sampled from two southern California hospitals. We limited our analysis to lung cancer survivors with a smoking history (N = 171) (i.e., current (n = 32) and former smokers (n = 139)). Logistic regression modeling was utilized to predict the likelihood of being a current or former smoker based on theoretical (HBM-related) predictors of whether lung cancer survivors decided to quit (i.e., whether they are former smokers vs. current smokers). **Results:** Analyses indicated that greater time since diagnosis and greater symptom burden predicted a higher likelihood of currently smoking,  $p's < .05$ .

Other predictors and demographic variables did not significantly predict likelihood of group membership,  $p's > .05$ .

**Conclusions:** Results suggest that lung cancer survivors who suffer more from cancer-related symptoms and are further from the date of diagnosis are more likely to continue smoking post-diagnosis. Our findings may help healthcare providers identify lung cancer survivors who may benefit from assistance with smoking cessation. Assistance may include assessment and relief from lung cancer-specific symptoms (e.g., fatigue, shortness of breath). Providing smoking cessation assistance to lung cancer survivors who continue to smoke may ultimately improve their survival. Further longitudinal research is needed to support our findings and identify other risk factors for continuing to smoke after lung cancer diagnosis.



**Talking is Teaching: Location: Hargreaves Hall, Reading Room - 15B**

*Speakers: Jamie Baum, Thailer Whitley*

*Faculty Mentors: Shanna Davis, Allison Wilson*

Previous research has shown that children from low-socioeconomic status (SES) families often fall behind their middle and upper class peers in early language development (Ridge, Weisberg, Ilgaz, Hirsh-Paskek & Muchnick Golinkoff, 2015). Low-SES family's conversations between parent and child appear to be less frequent, less interactive, and contain more directives and shorter utterances. Often, interventions addressing this language gap become cumbersome, expensive and time consuming. The purpose of this study is to examine how prompts, posters and signs in everyday environments (like a grocery store) affect parent-child conversations and interactions. Data was collected through trained researchers, who appear to be a fellow shopper, gathering data on interactions and conversations between parent and child over content that was put up in a grocery store aimed at sparking dialog. Behavior was coded using a coding instrument for behaviors of each adult-child group. This code is based off of the Dyadic Parent-Child Interaction Coding system, a validated and standardized system to assess quality of parent-child interactions. We hypothesize that when parents or children observe the posters, prompts and signs in the grocery store it will spark conversation between the child and parent. Specifically, we hypothesize that parents behavior of saying the name of the object, showing and describing the object to the child, and asking the child further questions will increase due to the prompts, posters, and signs. The current research offers the foundation toward a simple and inexpensive language intervention aimed at starting adult-child interaction in places that families often visit.

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**Telepsychiatry: Improving Psychiatric Services in Remote Skilled Nursing Facilities: Location: Hargreaves Hall, Reading Room - 2A**

*Speakers: Andrew Taylor, Greta Dauer, Taylor Kaech*

*Faculty Mentors: Rosalee Allan*

The lack of psychiatric services in skilled nursing facilities is becoming a severe problem due to the number of geriatric patients suffering with mental illnesses. Rural nursing homes are at a greater disadvantage, as services could be hours away. A new aid, called telepsychiatry, allows residents in rural skilled nursing facilities to easily access a psychiatrist over a private, secure video consultation. This treatment has been found to increase access to mental health care in these rural facilities. Current research is showing that telepsychiatry is reducing mental health care costs to skilled nursing facilities. Satisfaction rates of psychiatric care has positively grown with patients and providers, as many facilities did not have access to care, or would have to travel hundreds of miles to receive this care. These three factors can be attributed to better regulations from individual states, and more acceptance from Medicare and Medicaid. Although telepsychiatry has been around for decades, it is just now beginning to blossom in the hopes of stopping the mental health disparity from growing in these remote facilities.

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**The Association Between Race and Attitudes About Interracial Relationships: Location: Hargreaves Hall, Reading Room - 19**

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*Speakers: Micah Brown*  
*Faculty Mentors: Jessica Urschel*

The purpose of this study was to examine participants' attitudes toward five different racial groups: (1) Black/African American, (2) White, (3) Asian, (4) Hawaiian Native/Pacific Islander, and (5) Latino/Hispanic. The sample included a total of 114 psychology students from Bellevue College (n = 14), Eastern at Bellevue (n = 12) and Eastern main campus (n = 88). A cross-sectional survey was distributed through Sona Systems and instructor emails and hosted on Survey Monkey. Both a warmth scale and relationship scenario questionnaire developed by Herman and Campbell (2012) were used to gather data. Two one-factor MANOVA F-tests were used to determine participants' attitudes towards different racial groups and various interracial relationship scenarios with those groups. We hypothesized that all racial groups would significantly vary in their attitudes towards other races. Additionally, we hypothesized that all racial groups would significantly differ in their attitudes toward interracial relationships. Results showed that race is a factor associated with differing perceptions towards other racial groups and attitudes toward interracial relationships among college students. No significant differences were found among races with how they rated White or Asian people. Asian respondents generally held more negative attitudes than other groups, but this may be due to small sample size or response style. Findings of this study support previous research on variance of attitudes toward racial groups and interracial relationships (Herman & Campbell, 2012). Future research may focus on other factors that may affect attitudes towards other racial groups and interracial relationships.

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**The Association of Emotion Dysregulation with Borderline Personality and Its Symptoms: Location: Hargreaves Hall, Reading Room - 23**

*Speakers: Max Barham, Rachel Overland, Emma Wasser, Annika Rauch, Jacqueline Adams*  
*Faculty Mentors: William Williams*

Individuals diagnosed with Borderline Personality disorder (BPD) manifest unstable relationships, emotional lability and a disrupted sense of self. BPD includes a range of affective and behavioral symptoms, including emotion dysregulation, depression, anxiety, impulsivity, self-harm and attempted suicide (Linehan, 1993). Whereas several important environmental variables contribute to the development of BPD, Linehan's biosocial model asserts that biological predispositions increase vulnerability (Linehan, 1993). For example, the MAOA gene has an important role in regulation emotions and some variants of this gene are associated with depression, emotion dysregulation and BPD (Ni X et al., 2007; Joyce et al 2014). The purpose of our study is to investigate the relationship between emotion dysregulation, BPD and its symptoms. The participants were 242 undergraduate women. The instruments used for assessment were the: (1) Borderline Symptom List (BSL-23: Bohus et al., 2009); (2) Self Report Depression Scale (CESD: Radloff et al., 1977); (3) Beck Scale for Suicidal Ideation (BSSI: Beck, 1991); (4) Beck Anxiety Inventory (BAI, Beck, 1988); (5) Difficulties in Emotion Regulation Scale (DERS: Gratz, & Roemer, 2004); (6) Self-Harm Inventory (SHI: Sansone, et al, 2010); (7) Barrat Impulsivity Scale Patton et al, 1995), and (8) Little et al.'s Forms and Functions of Aggression Survey (2003). All variables were positively correlated with BPD. Several correlations stood out because they were extremely large relative to others. For BPD, these correlations were with depression (.84), emotion dysregulation (.75), and anxiety (.69). In addition, emotion dysregulation was highly correlated with depression (.75) and anxiety (.61). Correlation with these

affective measures were greater than those for suicidal ideation and self-harm which in turn tended to be greater than correlations with measures of aggression.

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**The Effect of Rural Healthcare Experience on Future Practice Location for Primary Care Professions in Rural Counties of Washington State (HS-5513): Location: Hargreaves Hall, Reading Room - 12A**

*Speakers: Luis Vela*

*Faculty Mentors: Anna Tresidder*

Rural areas across the United States are currently experiencing a workforce shortage of primary care healthcare providers. This problem is not just a local problem but is occurring in countries across the world. This research project will explore if there is a relationship between a primary care provider's practice location and if they come from a rural background or learned about rural healthcare during their medical education. Using the listservs for professional organizations and county medical societies, a link to a survey was emailed to providers in the rural counties of Washington. Results of the study will provide insights and strategies on how to increase the number of primary care providers in rural areas.

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**The Girls of Fort Shaw: Location: Hargreaves Hall, Reading Room - 14A**

*Speakers: Jessica Thoens*

*Faculty Mentors: Chadron Hazelbaker*

Today, in Fort Shaw, Montana a monumental arch stands tall proudly proclaiming the home of the 1904 World Champions. Beneath it, a trophy mounted on granite stone displays a picture of the Fort Shaw women's basketball team engraved with each of its members' names. The Fort Shaw Indian Boarding school closed its doors in 1910 and like the withering structures that remain, the legacy of these ten girls has slowly faded along with it. Although they each went their separate ways and lived their own lives when Fort Shaw closed, their bravery and athletic talents forever transformed the game of basketball, especially for women. Their story, their success, and their impact upon sport is a story that deserves to be remembered and told.

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**The Regulation of Self Following a Traumatic Brain Injury: Location: Hargreaves Hall, Reading Room - 15A**

*Speakers: Nicholas Mehrnoosh, Marysa Rogozynski*

*Faculty Mentors: Jonathan Anderson*

Traumatic brain injury (TBI) can be a life changing experience, which previous research has shown has the potential to fundamentally disrupt the continuity of the self, which leads to alterations in an individual's functional abilities. The self enables personal agency over several platforms of life within our communities and the broader society. Our research investigated the functional outcomes after a TBI, through semi-structured interviews. Among the 440 international participants, prolonged neurocognitive deficits (i.e., memory, attention, and executive functioning) were significantly associated with disruptive fluctuations in social roles and statuses, global functioning, and overall psychological resilience that hampered successful recovery trajectories. Our analysis showed that 82% (n=360) of participants reported significantly diminished self-efficacy and a perceived external invalidation of self in the years following their TBI, this was noted by marked differences in post-TBI values, beliefs, and attitudes. Furthermore, 77% (n=339) reported significant

differences in social roles post-TBI that were coupled with reports of chronic self-isolation and suicidal ideations. A multiple linear regression illuminated that these incidences were associated with a longer symptom emergence and treatment disparities among cognitive ( $p < .001$ ), emotional ( $p < .001$ ), and physical ( $p < .001$ ) post-concussive symptoms. Based on this analysis, we present findings that highlight significant cognitive and social strains further translate into imbalanced motivational processes affecting beliefs, attitudes, and behaviors. The result becomes a diminished psychological resilience, which can reinforce a negative appraisal of one's sense of self. From this perspective, we posit that recovery trajectories post-TBI may benefit from a holistic approach that incorporates both social psychological and neuropsychological approaches.

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**The United States' Practice of Bilateral Foreign Aid Does More Harm Than Good: Location: Hargreaves Hall, Reading Room - 5A**

*Speakers: Christian Turner*

*Faculty Mentors: Majid Sharifi*

This paper makes the argument that the United States' practice of supplying bilateral foreign economic assistance to sub-Saharan Africa has had a deleterious effect on the economic growth of recipient countries and has failed to achieve the goal of improving human development indicators in the intended beneficiaries. I attribute these outcomes to bilateral aid fueling corruption, having misguided objectives, and the placing of ineffective conditionalities on funding. The intent of this paper is not to prescribe an alternative to bilateral aid but rather to simply highlight the flaws in the current system. That said, the research covered in this paper does convene on the idea that for aid to be successful going forward, future policies need to be constructed with the unique economics and cultural circumstance of the recipient country in mind (as well as the goal of the recipient country becoming economically independent), rather than basing policies on past successes, such as The Marshall Plan, which has been routinely done and repeatedly produced failing foreign aid programs.

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**Understanding the Venezuelan Crisis and the Broader Context of American Intervention in Latin America.: Location: Hargreaves Hall, Reading Room - 11A**

*Speakers: Gloria Bravo*

*Faculty Mentors: Majid Sharifi*

Venezuela has been experiencing an economic, political and humanitarian crises. Once one of the richest nations in Latin America, the oil-exporting nation saw economic decline starting in the early 2000's. Largely due to hyperinflation and president Cesar Chavez's 'economic war'. In 2013, Nicolás Maduro took office and social unrest intensified. Since 2014, over 3 million Venezuelans have fled the nation, shortages of basic goods are daily occurrence and an increase in human rights violations-arbitrary arrest, torture, and killings by security forces. Venezuela political turmoil has culminated in a showdown for the presidency. The US has enacted 5 executive orders and 22 sanctions trying to pressure Maduro to relinquish power. All this has been occurring along the backdrop of one the worst humanitarian crises in recent history. With 90% of its citizens are living in poverty, 85% of medicines are scarce and 61.2% of Venezuelans report going to bed hungry. During this devastating crisis the US government promised to aid the Venezuelan people in their search for

liberty from a usurper regime and put their full support behind Juan Guaidó, the internationally recognized interim president. The US has announced \$20 million in humanitarian aid for the opposition, purposely initiating a political war over the control and distribution of aid. Administration officials have launched a hostile campaign against the Maduro regime ultimately worsening conditions for Venezuelan citizens in order to invoke regime change. American intervention in Venezuela is an opportunist scheme meant to exploit the current crises in order to further a neoliberal capitalist agenda and deliver president Trump an international political win. The US once again is following traditional policies and practices of American intervention and overthrow in a Latin American nation. Support is provided with the examples of Guatemala (1954), Dominican Republic (1965), Chile (1973) and Argentina (1975-76)

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**Validity of air displacement plethysmography compared to A-mode ultrasound in young adults: Location: Hargreaves Hall, Reading Room - 25**

*Speakers: Kaeli Shockley, Bailee Wohl, Erika Demmert, Carlie Storm, Buiford Martin, Zak Longoria*  
*Faculty Mentors: Katrina Taylor*

Assessment of body composition is becoming more common among gym facilities with the introduction of affordable techniques such as A-mode ultrasound. However, there is currently limited knowledge of the validity of A-mode ultrasound compared to gold standard estimates. PURPOSE: To determine the validity of A-mode ultrasound compared to air displacement plethysmography in young adults. METHODS: Young adults (n=24; 10 males) volunteered for the study and completed two body composition tests on the same day within 30-minutes of one another. Participants were instructed to refrain from physical activity and food consumption prior to testing and were asked to be euhydrated. All participants initially completed an air displacement plethysmography test using the BOD POD® followed by a seven-site ultrasound estimation of body composition using the Intelametrix® A-mode ultrasound system. Data were analyzed using Pearson product-moment correlations with an alpha level set at 0.05. RESULTS: Average body fat percent for air displacement plethysmography was 23.7±5.8 %, which was slightly lower than the seven-site ultrasound result (24.4±6.0 %). There were strong, positive correlations between the two estimates of body composition for percent body fat.

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