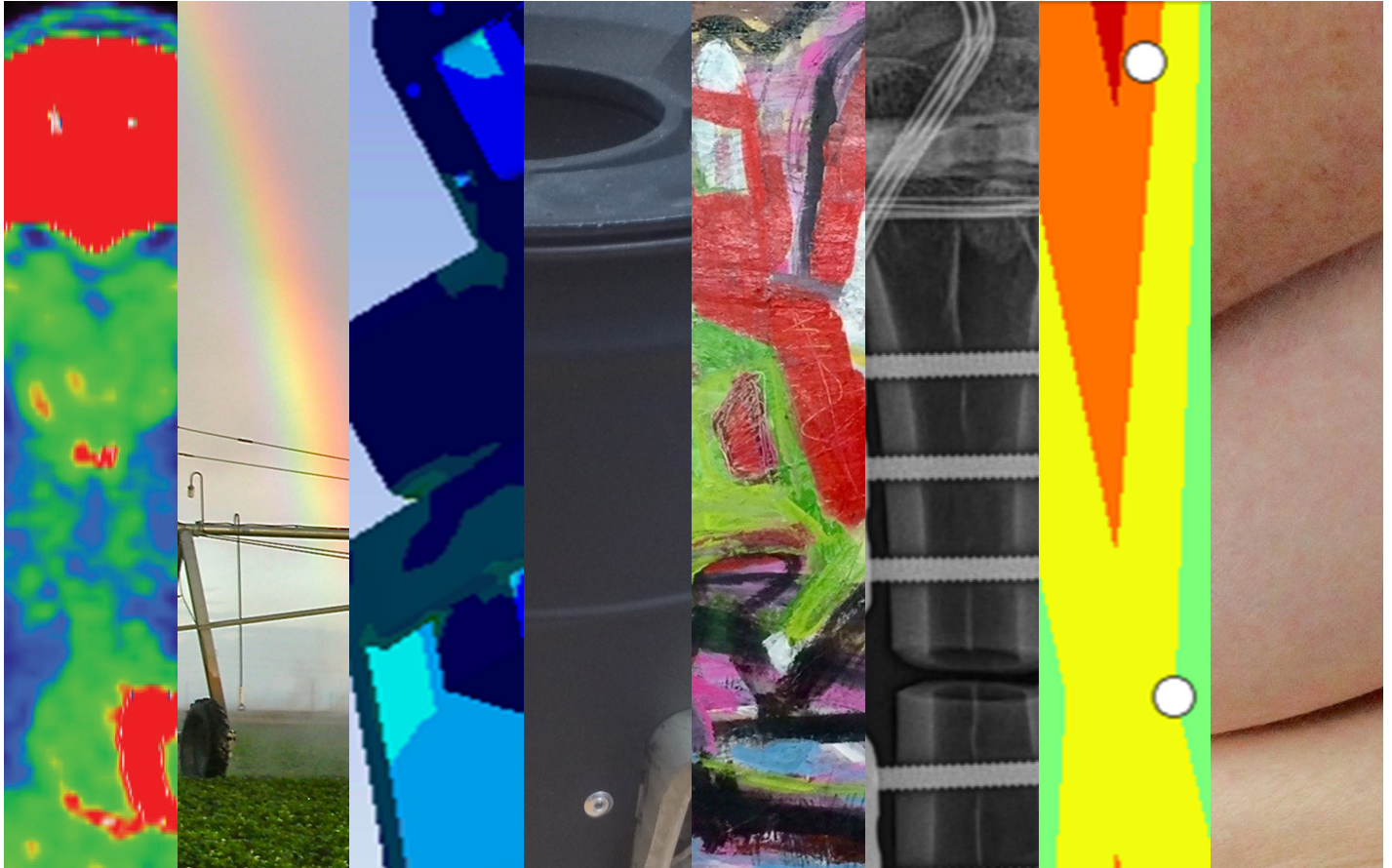


2015

# GRADUATE STUDENT SHOWCASE

---



---

**CELEBRATING RESEARCH AND CREATIVITY  
FEBRUARY 25, 2015**

**Colorado State University**

## Acknowledgments

---

We express our gratitude to the following:

### Planning Committee

Kirsten Graham

Maeve O'Donnell

Dr. Tammi Vacha-Haase, Associate Dean of the Graduate School

### Steering Committee

Dr. Asad Aziz, College of Business

Dr. Ken Blehm, College of Veterinary Medicine and Biomedical Sciences

Dr. Mark Brown, Office for Undergraduate Research and Artistry

Dr. Ellen Fisher, College of Natural Sciences and Office of the Vice President for Research

Mr. Chad Hoseth, Office of International Programs

Dr. Sue James, College of Engineering

Dr. Sonya LeFebvre, Warner College of Natural Resources

Dr. Kathy Partin, Office of the Vice President for Research

Dr. Melissa Reynolds, College of Natural Sciences

Dr. Bruce Ronda, College of Liberal Arts

Dr. Lise Youngblade, College of Health and Human Sciences

### Graduate School Staff

Ludy Avalos

Cathy Lee

Julie Paolucci

Debbie Sheaffer

### Award Sponsors

CSU Alumni Association

*Forever Green*

CSU Ventures

*Drivers of Innovation: Creative Works and Experimental Sciences*

Graduate School

*Excellence in Diversity and Social Justice*

*Graduate School Excellence Award*

Graduate School and

Vice President for Research

*Distinction in Creativity and Great Minds in Research*

Graduate Student Council

*First Year Graduate Student*

Office of International Programs

*Global Impact Research and Global Impact Artistry and Creativity*

Office for Undergraduate Research

*Undergraduate Choice Award and Artistry*

### Support Sponsor

CSU Colorado School of Public Health

Thank you for joining us at the inaugural Graduate Student Showcase. Special appreciation goes to all of the graduate students who presented at this year's event. The Graduate Student Showcase would not have been possible without your willingness to share your creative works and scholarship. An additional thank you to the judges who volunteered for the Graduate Student Showcase. Your time and efforts truly made all the difference in allowing us to recognize and celebrate graduate student excellence here on campus.

## CREATIVE WORK - KINETIC

Performer	Performance Time	Page
Kristin George Bagdanov	12:15 p.m.	4
Jessica Hill	10:45 a.m.	4
Ben Justis	11:30 a.m.	4
Abby Kerstetter	11:45 a.m.	4
Lara Roberts	11:00 a.m.	4
Pablo Romero Ordenana	12:00 p.m.	4
Anthony Walter	11:15 a.m.	4

## CREATIVE WORK NON-KINETIC

Abstract/ Space Number	Presenter	Page
1.	Cedar Brant	5
2.	Cara Coder	5
3.	Karen Eichel	5
4.	Ben Isaiah	5
5.	Dana Kettlewell	5
6.	Tessa Komine	5
7.	Kalie Mcmonagle	5
8.	Nicole Niederman	6
9.	Nuray Packard	6
10.	Kristi Rogers	6

## RESEARCH, SCHOLARSHIP. AND ENTREPRENEURSHIP

Abstract/ Poster Number	Presenter	Page	Abstract/ Poster Number	Presenter	Page
11.	Megan Aanstoos	7	48.	Shelby Chandler	12
12.	Reuben Addo	7	49.	Alex Chapman	12
13.	Jenny Aeling	7	50.	Caraline Chase	13
14.	Trevor Aguirre	7	51.	Manoj Reddy Chemarla	13
15.	Majid Ahadi Dolatsara	7	52.	Elliott Chiu	13
16.	Jina Ahn	7	53.	Micheline Chlipalski	13
17.	D Akalp	8	54.	Yunju Choi	13
18.	Arren Allegretti	8	55.	Nunya Chotiwan	13
19.	Mike Angstadt	8	56.	Lyndah Chow	13
20.	Amber Anthenien	8	57.	Alex Claxton	13
21.	Christine Apple	8	58.	Scott Compel	14
22.	Kristin Arabea	8	59.	Alistair Cook	14
23.	Martin Asmat Uceda	8	60.	Jeff Cook	14
24.	Shamil Assylbekov	9	61.	Jewel Crasta	14
25.	Wahid Awad	9	62.	Cassy Crawford	14
26.	You Soon Baek	9	63.	David Crawford	14
27.	Kim Ballinger	9	64.	Jenee Cyran	14
28.	Theresa Barosh	9	65.	Pranav Damale	15
29.	Lauren Bates	9	66.	Steve Dauphin	15
30.	Micah Battson	10	67.	Kristen Davenport	15
31.	Whitney Beck	10	68.	Matt Davidson	15
32.	Tanya Benjamin	10	69.	Leslie Davis	15
33.	Dustin Berger	10	70.	Emily Delorean	15
34.	Paul Binkley	10	71.	Sarah Delozier	16
35.	Scott Binns	10	72.	Jeremy Dertien	16
36.	Srinivasa Boddeda	11	73.	Marvin Antony Devadass	16
37.	Andrew Boissiere	11	74.	Gustavo Diaz	16
38.	Amy Boncella	11	75.	Kevin Dischino	16
39.	George Borleske	11	76.	Katherine Doggett	16
40.	Allyson Brothers	11	77.	Natalie Dollison	16
41.	Ginny Bruce	11	78.	Deb Domres	17
42.	Eric Bukovsky	11	79.	Enrique Doster	17
43.	Anne Byrne	12	80.	Adina Dumitrache	17
44.	Eli Cagen	12	81.	Rachel Eby	17
45.	Livia Camargo Garbin	12	82.	Elijah Edmondson	17
46.	Adlei Carlson	12	83.	Audrey Ek	17
47.	Anika Casem	12	84.	Riley Ellis	17

# *Index of Creative Work, Research, Scholarship, and Entrepreneurship*

Abstract/ Poster Number	Presenter	Page	Abstract/ Poster Number	Presenter	Page	Abstract/ Poster Number	Presenter	Page
85.	Eric Emerson	18	124.	Joni Hayward	23	163.	Carmen Ledesma Feliciano	28
86.	Stacy Endriss	18	125.	Christopher Hearon	23	164.	Erin Lee	28
87.	Erica Faulhaber	18	126.	Ash Heim	23	165.	Minwoo Lee	29
88.	Joseph Fauver	18	127.	Nicholas Heimann	23	166.	Brynson Lehmkuhl	29
89.	Timothy Fegel	18	128.	Jake Herman	23	167.	Christine Lin	29
90.	Andrew Felton	18	129.	Carolyn Hoagland	24	168.	Mei-Heng Lin	29
91.	Kristine Fischenich	18	130.	Beth Hoesly	24	169.	Yajing Liu	29
92.	Eve Fisher	18	131.	Matt Hogan	24	170.	Xiaoxiang Ma	29
93.	Suhrim Fisher	19	132.	Jacquie Holland	24	171.	Kelsea Macilroy	29
94.	Desiree Fiske	19	133.	Alissa Hooper	24	172.	June Macon	30
95.	Jo Fjelstrom	19	134.	Matt Hopken	24	173.	Estela Magallanes	30
96.	Darcy Fletcher	19	135.	Reza Iraj	24	174.	Angelina Maio	30
97.	Melissa Ford	19	136.	Lauren Ivy	25	175.	Shana Makos	30
98.	Elliott Forney	19	137.	Heather Jackson	25	176.	Kelly Mann	30
99.	Genevieve Forster	20	138.	Rachael Jaffe	25	177.	Michelle Mann	30
100.	Erika Foster	20	139.	Sam Jalali	25	178.	Mary Marisa	30
101.	Jenna Franklin	20	140.	Aimee Jalkanen	25	179.	David Markman	31
102.	Michael Friedman	20	141.	Sarah James	25	180.	Tim Marrinan	31
103.	Megan Fritz	20	142.	Daniela Jankovska	25	181.	Andy Martinolich	31
104.	Ben Gadomski	20	143.	Caitlyn Jarvis	26	182.	Tammy Matthews	31
105.	Wes Galbraith	20	144.	Swaetha Jebackumar	26	183.	Max Mattson	31
106.	Alexandra Gehring	20	145.	Joy Jiao	26	184.	Pavlina Mcgrady	31
107.	Brianne Gerlach-Mcdonald	21	146.	Valerie Johnson	26	185.	Amanda Mcguire	31
108.	Becky Gullberg	21	147.	Indika Kahanda	26	186.	Morgann Means	32
109.	Nic Gunvaldson	21	148.	Connor Kealey	26	187.	Michelle Mellenthin	32
110.	Carolina Gutierrez	21	149.	Jason Kephart	26	188.	Nancy Mendoza	32
111.	Reyila Hadeer	21	150.	Nathan Ketelhut	26	189.	Lauren Menger	32
112.	Whitley Hadley	21	151.	Aditya Khune	27	190.	Tarik Moataz	32
113.	Sam Hagopian	21	152.	John Kindred	27	191.	Karen Montgomery Moore	32
114.	Jaime Haines	22	153.	Phillip Knabenbauer	27	192.	Ashley Moore	32
115.	Ali Hamm	22	154.	Cassie Koerner	27	193.	Brianna Moore	33
116.	Marley Hamrick	22	155.	Jennifer Kopanke	27	194.	Ally Moravec	33
117.	Samantha Hantzepetros	22	156.	Chris Kotalik	27	195.	Jessica Morris	33
118.	Victoria Harcy	22	157.	Beth Krehbiel	27	196.	Dulcinea Munoz Gomez	33
119.	Renee Harmon	22	158.	Kyungnyer Ku	28	197.	Amit Munshi	33
120.	Genevieve Hartley	22	159.	Nic Kuon	28	198.	Rob Musci	33
121.	Brody Hatch	23	160.	Kevin Labus	28	199.	Garrett Mynatt	33
122.	Morgan Hawker	23	161.	John Ladd	28	200.	Bella Neufeld	34
123.	Garrett Hayes	23	162.	Emily Lapadura	28	201.	Megan Neufeld	34

Abstract/ Poster Number	Presenter	Page	Abstract/ Poster Number	Presenter	Page	Abstract/ Poster Number	Presenter	Page
202.	Maia Nguyen	34	241.	Mohsin Sayed	39	280.	Chad Waddington	45
203.	Luisa Nieto Ramirez	34	242.	Katherine Schaumberg	39	281.	Julie Walker	45
204.	Noelle Noyes	34	243.	Matthew Scholfield	39	282.	Susanne Walker	45
205.	Erin Nuckols	34	244.	Jena Schwake	40	283.	Lei Wang	45
206.	Gaby Ocadiz Velazquez	34	245.	Brittney Scott	40	284.	Brent Ware	45
207.	Andrew Ogle	35	246.	Derek Sebastian	40	285.	Kanawee Warrit	45
208.	Aimee Ortega	35	247.	Rabab Sharif	40	286.	Pam Wegener	45
209.	Javier Ospina	35	248.	Jenifer Shattuck	40	287.	Maggie Weinroth	46
210.	Pooria Pakrooh	35	249.	Mallory Shields	40	288.	John Whalen	46
211.	Lara Pantlin	35	250.	Chelsey Shivley	40	289.	Ben Wheatley	46
212.	Casey Patrizio	35	251.	Aaron Sidder	41	290.	Stacy Willett	46
213.	Hannah Pauly	35	252.	Hillary Smith	41	291.	Kelly Williams	46
214.	Chrissa Percival	36	253.	Hannah Staley	41	292.	Kassi Willingham	46
215.	Ben Peters	36	254.	Shelly Staley	41	293.	Hailey Wilmer	46
216.	Mark Peterson	36	255.	Erin Strutz	41	294.	Becky Witinok-Huber	47
217.	Veljko Petkovic	36	256.	Erin Stuckert	41	295.	Chris Wolff	47
218.	Natalie Pitts	36	257.	Kat Stutzman-Rodriguez	41	296.	Ariel Wootan Merkling	47
219.	Courtney Pollard	36	258.	Jiayi Sun	41	297.	Keri Wright	47
220.	Sheridan Potter	36	259.	Erika Sutor	42	298.	Dongyang Xu	47
221.	Sarah Prendergast	37	260.	Zaker Ali Syed	42	299.	Wenlong Xu	47
222.	Amy Quinn	37	261.	Suwimol Tangtrongsup	42	300.	Pamela Yapor	48
223.	Casey Quinn	37	262.	Eric Tauchman	42	301.	Gabriel Young	48
224.	Matt Racine	37	263.	Alison Thurston	42	302.	Molly Zeller	48
225.	Lauren Radakovich	37	264.	John Tipton	42	303.	Annie Zhang	48
226.	Nicole Ramo	37	265.	Kathryn Tracy	43	304.	Hui Zhang	48
227.	Dan Regan	37	266.	Olivia Tracy	43	305.	Yufen Zhou	48
228.	Kate Remley	38	267.	Ashley Turnidge	43	306.	Rhema Zlaten	48
229.	Grant Riley	38	268.	Wendy Tuttle	43	307.	Todd Zurlinden	back cover
230.	Ozymandias Roberts	38	269.	Adel Uhlarik	43			
231.	Santiago Rodriguez Lopez	38	270.	Tunga Ulambayar	43			
232.	Paul Rojas	38	271.	Morgan Valley	43			
233.	Raimundo Romero	38	272.	Marcia Van Eden	44			
234.	Matthew Rothstein	38	273.	Anders Van Sandt	44			
235.	Amy Robinson	38	274.	Crystal Vander Zanden	44			
236.	Erin Ryan	39	275.	Dane Vanhoozer	44			
237.	Sanaz Sadegh	39	276.	Dan Villar	44			
238.	Patrick Sanders	39	277.	Noah Voreades	44			
239.	Perla Sandoval	39	278.	Anthony Vorster	44			
240.	Tyler Saxon	39	279.	Dhaval Vyas	45			



# Creative Work – Kinetic

## 12:15 p.m. The Somatic Wager

KRISTIN GEORGE BAGDANOV

Department: English

Just as the mere naming of the Anthropocene has enabled productive discussions across academic fields, naming a new category of ecopoetics will encourage reflection on the role of poetry in the wider sphere of environmental communication. This category is the “anthropocenic lyric.” This lyric helps us cultivate an ecological self through form and content, enacting and professing methods of sustaining this self in the Anthropocene. My critical paper expands upon this lyric by looking at contemporary poets Bin Ramke, Juliana Spahr, and Brenda Hillman, while my collection of poems, “The Somatic Wager,” engages the anthropocenic crisis formally and conceptually.

## 10:45 a.m. India’s Daughters

JESSICA HILL

Department: English

“India’s Daughters” discusses the fear of rape a woman encounters on her solo travels through India. She arrived three weeks after the worldwide media scandal of Jyoti Singh Pandey’s gang rape and subsequent death, and the author couldn’t let her story go as she made her way through the country as a solo, white, female traveler. It sheds light on the way media upholds Orientalistic ideals by covering rape in India differently than rape in the U.S., and how this shapes Americans’ inherent fear of “other.” This essay is an excerpt from a memoir-in-essays titled, “The People We Meet.”

## 11:30 a.m. Recitative

BEN JUSTIS

Department: Music, Theatre, and Dance

This piece was composed as a commission for a friend’s senior recital at CSU. The principle theme reminded me not just of operatic interludes but the “recitatives” Paul Lansky uses in his piece *Threads* as well. This piece was submitted to the 2013 Atlanta Symphony Modern Snare Drum Competition and is dedicated to my friends.

## 11:45 a.m. She Took Her Power from the Water

ABBY KERSTETTER

Department: English

In 1901, Michael Chabitnoy, an orphan and full-blooded Aleut, was sent to the Carlisle Indian School and subsequently married a non-native, took a factory job, and settled in Pennsylvania, far removed from his Native Alaskan heritage. This body of poetry not only explores family history and the Aleut culture, but also incorporates personal and Native American myth and addresses questions of the relationship of culture, place, and the individual. Heavily influenced by research and documentary poetics, this work provides witness to and seeks understanding of the Aleut people, the history of Native Americans, and historical acts of acculturation and appropriation.

## 11:00 a.m. Performing Identity Discomfort

LARA ROBERTS

Department: English

Writers’ identities are delicate façades, constructed from essays, poems, and artist statements, and performed at conferences and readings. These are spaces where we can be comfortable in the accuracy of our own self-portrayals, but I am more interested in the spaces where our pieces are open to be read (and misread) by others. By recording myself reading aloud others’ works and inviting others to read mine, I hope to create a space of discomfort to explore the intersections between our own performances and others’ perceptions of us. Here, we might see a facet of ourselves that we have not before.

## 12:00 p.m. Songs from the New World

PABLO ROMERO ORDENANA

Department: Music, Theatre, and Dance

A vocal performance showcasing the musical heritage of the new world, including works from Latin American and influential Spanish composers such as Gerardo Guevara, Carlos Gomes, Victor Carbajo, Astor Piazzolla, Emilio Arrieta, Federico Moreno Torroba.

## 11:15 a.m. Professional Music Website/Performance

ANTHONY WALTER

Department: Computer Information Systems

I’m making a website that features all my creative work particularly in the area of music and try to get new listeners hooked to more advanced music. So far, I have a *Bach is Better Than Pop* video which is an exciting Bach/Busoni Fugue with a little information about what a fugue is. I just made a video which I transformed the musical, *Phantom of the Opera*, into a piano piece with a score to visually follow. I also have an exciting original composition coming soon, and a book of perfect-pitch pedagogy that I’m currently selling.

# Creative Work – Non-Kinetic

## 1 The Hidden Hinge: Mapping Memory and Myth through Poetry

CEDAR BRANT

Department: English

Both science and poetry are organizational nets that I place over the erratic natural and emotional worlds and begin to track patterns, growth, and unlikely relationships. I explore the movement between external and internal experience of place, using landscape as a lens to the more difficult-to-access inner emotional world. I'm compelled by poems as a manifestation of memory and myth unearthed from the body, and as a subconscious compass that informs our actions. Using the tools of language and imagery of landscape, I seek to navigate the process of symbolic transformation through poetic storytelling.

## 2 Folds

CARA CODER

Department: Art and Art History

My Folds series explores the significance of the inherited physical insecurity through maternal line, while also trying to break its cycle. My own negative body image inspired this work. This negative image of my physical appearance was cultivated not only through our media and culture, but also by my mother and her mother, without any of us realizing it. This insecurity becomes passed down like a family heirloom unless we recognize it and put it to rest by celebrating our beautiful feminine appearance.

## 3 The Face of Diversity

KAREN EICHEL

Department: School of Education

Tune into any kind of media source; television, newspaper, social media etc. Chances are controversial topics involving diversity are there. This work focuses on exploring the meaning of diversity by involving the public. In attempts to reach a broader audience and provide a space where conversations about diversity can be had with everyday people, a contemplative practice will be used to obtain visual and qualitative representations of diversity. Individuals will be asked to provide an explanation of diversity based on their own beliefs, experiences and understanding alongside their own portrait. Using the collected images, diversity will be displayed.

## 4 Similarities of the Microcosm and Macrocosm: A Sierpinski Fractal Set

BEN ISAIAH

Department: Art and Art History

The body of work that I have developed over the last three years in Colorado State University's Master of Fine Arts Program directly addresses relationships present all around us in the physical world. Whether or not these relationships are visible to the naked eye they are nonetheless extant. For example, resemblances between the structural makeup of matter occurring at a scale similar to that of our own bodily cells and matter occurring at a galactic scale can be surprisingly similar.

## 5 Middle School Outreach Ensemble

DANA KETTLEWELL

Department: Music, Theatre, and Dance

The Middle School Outreach Ensemble (MSOE) is a program designed to further the development of quality music education in Northern Colorado by providing a musical experience for middle school band students and hands-on teaching experience for CSU music education students. Both students and teachers leave the experience with heightened skills, a sense of community, and a perspective on social justice. In the future, the program will expand to include choir and orchestral students. Also, the feedback structure of the program will help to create an evaluation system for current teachers to use in the field.

## 6 MyCart-A Personal Shopping Guide for Eating Healthfully on a Budget

TESSA KOMINE

Department: Food Science and Human Nutrition

"MyCart" is a visual aid developed for the final project of CSU's Nutrition Education Theories and Practice graduate course. The educational material, based on the USDA's MyPlate food groups, is a large, placemat-like item that can be transported with the consumer to the grocery store and placed at the bottom of the cart. This guide will serve as a visual cue of nutritious, low-cost food options that these individuals can choose. While originally developed as part of a course project, this concept has the potential to be used as a nutrition education initiative at grocery stores/supermarkets.

## 7 I'm Not Done Talking!: Stitches in Feminist Communication Scholarship

KALIE MCMONAGLE

Department: Communication Studies

If feminist classes aren't chalk full of bra-burnings, witchy hexes, or home economics, what exactly goes on in there? To boot, why does feminist scholarship matter to communication, engineering, or foreign language studies? This series of 8 embroidery pieces explores the ways in which feminist scholarship has affected how we understand what has been considered "neutral", "objective", and "historical" knowledge throughout academia. Each piece hails back to a well-worn tradition of recording women's knowledge in fiber and the labor of fingertips, while recording influential women's voices in a form that speaks to permanence in a quickly moving world.

## **8 Number 5**

**NICOLE NIEDERMAN**

Department: College of Liberal Arts

Number 5 comments on the Middle Eastern perspective of the Iraqi war using symbolism, collage-referenced imagery, and color psychology. An older female soldier walks toward the battle zone and protects the small girl, who is scared of being alone and vulnerable. In spiritual terms, the number 5 represents instability, radical change, and transformation during a chaotic journey. Inspired by spiritual empowerment, and international current events, Niederman chooses young adult subjects for her work that act as messengers of awareness and advocacy. Her degree, Art Leadership Administration, trains her on how to use art for cultural service and community engagement.

## **9 Gateway**

**NURAY PACKARD**

Department: Art and Art History

In my drawing and paintings, I tend to analyze and attempt to understand certain cultures in scientific and historic terms in order to make statements about memory and identity; because I believe memories have some contribution to our identity, as we build on them when creating new memories. In my studies, I research artist from the last hundred years, replicating their technique in my own compositions. I draw spontaneously to capture fluid motion and energy. I expect the viewer to experience the work on their own.

## **10 Indigo Eclipse: Combining New and Old Surface Design Technologies**

**KRISTI ROGERS**

Department: Design and Merchandising

Inspired by an eclipse last fall, this silk chiffon garment features methods of surface design which are not commonly found together. The piece demonstrates that just like an eclipse, new techniques such as wearable technology and older technologies such as dyeing with indigo, can coexist beautifully. An accelerometer, a Lilypad Arduino, conductive thread, and six magenta light emitting diodes (LEDs) are sewn into the rear portion of the garment. As the wearer moves, the accelerometer senses movement along the hem of the dress on the x, y, or z axis, and the LEDs light up accordingly.



# Research, Scholarship, and Entrepreneurship

## 11 Do Mesenchymal Stromal Cells Influence Minimal Residual Osteosarcoma Disease?

MEGAN AANSTOOS

Department: Interdisciplinary - Bioengineering

In this project, we hypothesized that MSCs would have no influence on pulmonary metastases or local disease recurrence in a minimal disease setting. A primary tumor was established in mice, followed by either a wide or narrow margin amputation. Two cohorts of mice received MSCs locally into the surgical site or intravenously. Development of pulmonary metastases or local recurrence was monitored by BLI and caliper measurements. Lungs and local recurrence were examined histologically. Local MSC administration appears to be safe; however, further study is warranted to evaluate the safety and influence of IV MSCs on minimal residual pulmonary metastatic disease.

## 12 Heavy Marijuana Use Associated with Heavy Use of Other Substances

REUBEN ADDO

Department: School of Social Work

This study examined levels of marijuana usage and the potential correlation with cocaine, heroin, PCP, LSD, and alcohol use among American Indians and non-Indians using data from the Tri-Ethnic Center for Prevention Research at CSU. Results indicated significant associations between marijuana use levels and use of cocaine, heroin, PCP, LSD, and alcohol. There were significant differences between American Indians and non-Indians on marijuana and cocaine use levels; but there were no significant differences between marijuana use levels and levels of heroin, LSD, PCP, and alcohol. Results support the use of marijuana as an indication of abuse of other substances.

## 13 End of Life & Hospice as Experienced by LTC workers

JENNY AELING

Department: Psychology

This qualitative study is on the experiences of long term care (LTC) workers as they work with older adults near the end of their life with a specific focus on hospice services. Ten LTC facility nursing staff will be interviewed about their experiences of resident's end of life and differences they see between those who use and do not use hospice services. Interpretive Phenomenological Analysis will be used on all interviews to extract meaning and themes. This project is currently still being fine-tuned and I will begin collecting data by March 2015. Results will hopefully help both LTC workers and residents.

## 14 Effects of the Addition of White Graphene to Hydroxyapatite

TREVOR AGUIRRE

Department: Mechanical Engineering

The bioceramic hydroxyapatite (HA) is an excellent analogue for human bone because of its biocompatibility; however, the fracture toughness of HA is too low for most implant applications. The goal of this project is to produce, via spark plasma sintering techniques, a tougher HA composite with the addition of boron-nitride nanosheets (white graphene, WG). Sintered samples will be tested for flexural strength, fracture toughness, hardness, elastic modulus, energy dissipation, and biocompatibility. Microstructural characterization will be performed using scanning electron and optical microscopy as well as x-ray diffraction spectroscopy.

## 15 Non-Intrusive Pseudo Spectral Approach for Stochastic Macromodeling of EM Systems

MAJID AHADI DOLATSARA

Department: Electrical and Computer Engineering

In this work, a novel stochastic macromodeling technique for the variability analysis of complex electromagnetic (EM) structures is proposed. This work combines a pseudo spectral approach with the Loewner matrix interpolation technique to generate the polynomial chaos macromodel from the stochastic S-parameters. The major benefit of the proposed strategy is that by exploiting the non-intrusive nature of the pseudo spectral approach, the stochastic macromodel can be generated directly from a small number of deterministic EM full-wave simulations. This enables the utilization of the robustness and versatility of conventional deterministic full-wave techniques without the need for the cumbersome stochastic Galerkin formulation.

## 16 Calling and Well-Being

JINA AHN

Department: Psychology

This study examined how three dimensions of calling relate to career and well-being variables between the U.S. and the Korean students. Results indicated that calling is positively linked to outcome variables in both groups. However, the most significant dimensions were different between two groups. Purposeful work and pro-social orientation were positively linked to career decision self-efficacy in the U.S. group, but for the Korean group, only the purposeful work was significant. Regarding life satisfaction, only the pro-social orientation dimension was significant in the U.S group, whereas all three dimensions were significant and purposeful work was the most responsible among Koreans.

## 17 Benchmarking Organizational Performance of the Wyoming Highway Patrol's Divisions

D AKALP

Department: Construction Management

Wyoming Highway Patrol (WHP) is a data-driven organization, which uses multiple measures to assess performance. These measures can be used for a comparative performance assessment in an effort to benchmark the best performing WHP divisions. The research's objective is to develop a "Benchmarking Analysis" to compare the inefficient and efficient divisions of the WHP and to reveal the operational and managerial best practices through surveys to be conducted with the field officers and division lieutenants. Identified best practices will be used by the inefficient divisions to improve their performances; and this will ultimately enable WHP to attain organization-wide performance improvement.

## 18 Herders' Local Knowledge on Mongolia's Landscapes and Boundaries

ARREN ALLEGRETTI

Department: Interdisciplinary - Ecology

Socio-ecological boundaries are deeply imbedded in rangeland landscapes. Recognizing boundaries and stakeholders integrate local knowledge and apply frameworks for decision-making and policy. We explore Mongolian herders' knowledge of their pasture boundaries. Research questions include: (1) what boundaries are depicted on herders' participatory maps? and (2) how are boundaries discussed through herders' participatory mapping narratives? We conducted participatory mapping and informal interviews (n= 35) with herder groups and local government officials in Mongolia. Participatory mapping narratives were qualitatively coded applying visual grounded theory. Narratives revealed adaptive practices influenced and facilitated by governance, hydroclimatic, geomorphological, and ecological boundaries.

## 19 Access to Justice through Environmental Courts and Tribunals

MIKE ANGSTADT

Department: Political Science

As environmental issues diversify, many developing countries are authorizing specialized environmental courts and tribunals ("ECTs"). When compared to generalist courts, ECTs are frequently presumed to enhance access to justice and yield more thorough consideration of environmental issues. This project reflects case study examination of two established ECTs, India's National Green Tribunal and New Zealand's Environment Court, and how they fulfill the objectives of ECTs. Finding that both institutions advance environmental protections, this project provides a foundation for future research examining the degree to which ECT orders are implemented in practice, and the tangible environmental outcomes they engender for sensitive populations.

## 20 Evaluation of an Intervention to Reduce Binge Drinking while Tailgating

AMBER ANTHENIEN

Department: Psychology

Social norm interventions (SNI) demonstrate healthy drinking norms in order to challenge students' erroneous overestimations of peer alcohol use and reduce drinking. This investigation aimed to reduce binge drinking in a common drinking context: tailgating, using a gender-specific SNI. A randomized controlled trial was conducted in which students (N = 253) were assigned to one of three experimental conditions: a control, a SNI, and a gender-specific SNI. Results indicated students in the gender-specific condition consumed 0.6 drinks less than the control condition ( $z = -1.78, p = .07$ ). Future research should evaluate the effectiveness of gender-specific SNIs in additional contexts.

## 21 Patterns of Behavior in Alzheimer Units: Examining Physical Environment Interface

CHRISTINE APPLE

Department: Design and Merchandising

The high demand for beds within secure units for individuals with Alzheimer's emphasizes the need to carefully and knowledgeably evaluate the physical environment in which these individuals reside to achieve the highest quality of life possible. The environmental needs of individuals with Alzheimer's differs from cognitively intact individuals and new ways in which these environments impact those with Alzheimer's is being revealed through research as well as the popular press. This study examines how physical environments of SCUs influence positive and negative behaviors among individuals with Alzheimer's to expand the evidence supporting spatial planning, care practices, and approaches to socialization.

## 22 Nitric Oxide Releasing Polymeric Systems for Wound Healing Applications

KRISTIN ARABEA

Department: Chemistry

Biopolymers are commonly used in medical devices, but they are limited by their inability to prevent infection, and promote cell growth. The scientific community has moved toward a dual approach where bioagents, i.e. nitric oxide, are incorporated into biopolymers to enhance their performance. Nitric oxide (NO) is a known naturally-occurring small molecule that presents antimicrobial and cell proliferation properties among others. S-nitrosated dextran cysteamine is used as an NO donor, and was blended with Tecoflex SG80A, a common polyurethane used for medical devices, to make NO-releasing films. These films were tested to confirm the NO release capabilities and biological performance.

## 23 Simulations of Magnetic Antivortices in Nano-Patterned Materials

MARTIN ASMAT UCEDA

Department: Physics

Recent advances in nanofabrication have facilitated new scientific investigations of magnetism in nanopatterned systems, which are important for information storage technologies as well as for future magnonics and spintronics devices. Computer simulations are a powerful

tool that compliment experimental investigations since they provide a means to monitor the evolution of not just the details of the spin distributions but also the energetics of the system, which leads to a deeper understanding of magnetic phenomena at the nanoscale. Here we use micromagnetic simulations to investigate the dynamics of magnetic antivortices in pound-key-like structures made of 40-nm thick Permalloy (Ni80Fe20).

## 24 T2K T1K

SHAMIL ASSYLBEKOV

Department: Physics

T2K is an international neutrino physics experiment situated in Japan designed to investigate neutrino's various mysterious properties. T2K has two near detectors, ND280 and INGRID, and a Super-K far detector. ND280 has multiple sub-detectors with the Pi-Zero Detector (P0D) being of interest to this neutrino data analysis. This work describes the first neutrino cross-section measurement of charged-current (CC) single charged pion ( $1\pi^+$ ) interaction channel on water as a target using P0D data.

## 25 Revisiting the Hidden Plant Part-Wheat Roots for Drought Tolerance

WAHID AWAD

Department: Soil and Crop Sciences

Drought is among the most serious environmental challenges farmers face and is considered the main cause for yield reduction. The development of a deep and extensive root system is a drought adaptation mechanism to allow water and nutrient extraction from the soil. We conducted two greenhouse studies to investigate the variation in root architecture in winter wheat under drought stress. Wheat roots scans were analyzed with WinRhizo software. Entries differed significantly ( $P < 0.05$ ) for root traits. The variation in root traits can be exploited in breeding programs to help design plants with the best-adapted root traits to withstand drought stress.

## 26 Interspecific Reproductive Barriers (IRBs) in Wild Tomato Species

YOU SOON BAEK

Department: Biology

Interspecific Reproductive Barriers (IRBs) maintain species integrity by preventing interspecific hybridization, an essential facet of the biological species concept. In wild tomato species (*Solanum* sect. *lycopersicum*), unilateral incompatibility (UI) prevents hybridization in one direction of an interspecific cross by inhibiting pollen tube growth in the pistil. In my research project, I have assessed pollen tube growth in pistils between all 13 members of the tomato clade and investigated whether a mechanism involved in self-incompatibility is also involved in IRBs. This study will provide comprehensive study of pollen-pistil interaction and an evidence for a molecular interaction between interspecific and intraspecific incompatibility.

## 27 Improving Liver Functions of Hepatic Cell Lines In Vitro

KIM BALLINGER

Department: Mechanical Engineering

Primary human hepatocytes (PHH) are the gold standard for toxicity screening applications; however, sourcing issues necessitate alternative cell sources. The HepaRG cell line, derived from a cancer, has yielded promising results as a model for high-throughput drug screening but the phenotypic functions remain low relative to the normal adult human liver. Here, we utilized semiconductor-driven micropatterning to control homotypic and heterotypic cell-cell interactions of HepaRG cells and supportive stromal cells to further improve liver functions when compared to conventional pure monolayers. Our platform could allow better utilization of HepaRG for drug screening and studying hepatitis C viral infection.

## 28 Indirect, Plant-Mediated Interactions, Galls, and Biological Control

THERESA BAROSH

Department: Interdisciplinary - Ecology

My research examines the theory and pertinent ecological questions associated with community dynamics, particularly focusing on plant-mediated insect competition and managing invasive plants. Considering applications of ecological concepts, I propose potential solutions to controlling an invasive plant in Colorado. Specialist gall-forming insects can function as biological control of invasive plant species, such as Russian knapweed (*Acroptilon repens*). A prominent question in biological control is whether two biological control agents are better than one. Discussing future research directions for addressing this problem, I consider how research could improve biological control practices and address prevailing questions concerning insect competition.

## 29 The Fate of Nontested Information in the Testing Effect

LAUREN BATES

Department: Psychology

Retrieval practice (i.e. testing) is a strategy for enhancing memory that has been demonstrated repeatedly in both laboratory and applied contexts. While a direct effect of this idea is increased retention of tested information, past research has been inconclusive when looking at certain indirect effects of testing. This set of experiments sought to determine whether a memory effect emerged for information that is related to tested information, but not tested. Two experiments examined participants' memory for cue-target pairs where semantic relatedness, delay, and final test format were manipulated. The results are meant to help reconcile competing theories in this paradigm.

### **30 Mechanisms of Vascular Dysfunction in Obese and Diabetic Mice**

**MICAH BATTSON**

Department: Food Science and Human Nutrition

Cardiovascular diseases (CVD) are the leading cause of death in Western societies. Obesity and type II diabetes (T2D) increase the risk of CVD, due in large part to the development of vascular dysfunction. However, the underlying mechanisms by which obesity/T2D contribute to the development of CVD are not fully known. In the present study, we utilized a diabetic mouse model to assess endothelial dysfunction and large elastic artery stiffness, two independent risk factors for CVD, and performed biochemical analysis to gain insight into the mechanisms contributing to vascular dysfunction.

### **31 Developing GAMs to Identify Algal Biomass Controls in Mid-Atlantic Streams**

**WHITNEY BECK**

Department: Interdisciplinary - Ecology

Excess benthic algae produces harmful eutrophic conditions in freshwater streams. Generalized additive models (GAMs) were developed from EPA's EMAP Mid-Atlantic streams dataset to identify major controls on algal biomass. Top GAMs were chosen using three backward selection methods and evaluated using cross-validation. Models selected via generalized cross-validation scores and p-values included similar covariates and performed well for deviance explained (73.2%, 68.5%), correlation of observed and fitted values ( $r > 0.40$ ), and model calibration. All models contained four overlapping covariates, including two macroinvertebrate parameters. This study highlights differences in selection methods and shows that biological covariates provide valuable information in stream algae models.

### **32 Daycare/Preschool Participation Disparities between Children with and without Disabilities**

**TANYA BENJAMIN**

Department: Occupational Therapy

Children's participation in school-based activities is an indicator of their inclusion. There is need for comprehensive knowledge about disparities in children's participation during the early childhood period to guide intervention. This study aims to build knowledge on similarities and differences in daycare/preschool participation, supports and barriers between young children with and without disabilities. Data were drawn from 129 parents of young children with and without disabilities. Parents completed the Young Children's Participation and Environment Measure online. Results suggest moderate to large group differences based on disability status in young children's daycare/preschool participation and perceived environmental supports.

### **33 Microscale Engineering Strategies to Functionally Mature iPSC-Derived Human Hepatocytes**

**DUSTIN BERGER**

Department: Interdisciplinary - Bioengineering

Current in vitro hepatic differentiation protocols generate induced pluripotent stem cell-derived human hepatocytes (iHeps) with low and difficult to maintain levels of liver functions relative to adult primary human hepatocytes. In contrast to conventional monolayer culture methods, our engineered micropatterned co-culture (iMPCC) platform leverages controlled heterotypic cellular interactions between iHeps and supportive 3T3-J2 fibroblasts to significantly enhance the functional maturation and longevity of iHeps within industry-standard, multi-well culture formats. In the future, iMPCC could prove useful for drug screening, studying molecular mechanisms underlying iHep differentiation, modeling liver diseases, and integration into human-on-a-chip systems designed to assess multi-organ responses to compounds.

### **34 Science Fiction and the STEM Fields: Interdisciplinary Education**

**PAUL BINKLEY**

Department: English

The presenter outlines his work and research in designing a high-school-level English course aimed at using science fiction as a tool for interdisciplinary learning. Taking advantage of this unique and often marginalized form of literature can open new avenues for engaging students' existing passions and hooking student interest into learning in the science fields. Based on ongoing and existing research, this hypothetical course is intended to support an interdisciplinary approach to both learning and teaching by using science fiction novels, informational science writing, and critical theory to foster inquiry, language skills, and science proficiency in those students.

### **35 Combining Curcumin and Alpha-Lipoic Acid to Treat Metabolic Syndrome**

**SCOTT BINNS**

Department: Health and Exercise Science

The efficacy of combined curcumin (CUR) and alpha-lipoic acid (ALA) supplementation to improve characteristics of metabolic syndrome in overweight humans has never been evaluated. Hypothesis: 12-weeks of daily CUR+ALA dietary supplementation will improve metabolic and cardiovascular health in overweight adults. Using a randomized, placebo-controlled, double-blind design, we have determined that, compared with placebo (n=5), CUR+ALA (n=7) did not affect resting metabolism, the thermic effect of feeding, or insulin sensitivity, but did increase systolic blood pressure. Both supplements decreased %body fat. These preliminary data do not support the use of CUR+ALA to improve metabolic and cardiovascular health in overweight adults.



### 36 Using Humanized Mice Model to Explore HIV Transmission to Humans

SRINIVASA BODDEDA

Department: Interdisciplinary - Cell and Molecular Biology

It is clear that HIV originated from multiple independent cross-species transmission events of SIV to humans. However, the selective pressures and mechanisms by which a founder SIV virus adapts to a new human host remain poorly defined. Studying SIV transmission to humans has been limited by the lack of an appropriate animal model. Non-Human Primates (NHP) such as Chimpanzee being used for this studies but we are the first group to use Humanized Mice to study SIV transmission and evolution to HIV.

### 37 Fundamental Studies of Laser Ignition of Methane-Air Mixtures

ANDREW BOISSIERE

Department: Mechanical Engineering

One of the most promising solutions to achieving energy efficiency and reducing the harmful emissions from internal combustion natural gas engines is to operate at increasingly lean conditions. In an effort to design engines that can be run increasingly leaner, laser ignition systems are being investigated to replace conventional spark ignition systems. Potential advantages of laser ignition over conventional spark ignition include the ability to locate the spark kernel anywhere inside the combustion chamber, the elevated temperature of the spark kernel, and the lack of electrodes that may impede the propagation of the flame.

### 38 Investigation of Prion-Like Domains in RNA-Binding Proteins

AMY BONCELLA

Department: Chemistry

Recently, mutations in a number of RNA-binding proteins have been linked to various neurodegenerative diseases. Many of these proteins appear to aggregate via regions termed prion-like domains (PrLDs). These PrLDs are thought to mediate the assembly of cytoplasmic granules such as P bodies. We are using fluorescence microscopy to investigate how mutations in the PrLD of the yeast processing body protein Lsm4 alter the dynamics of P body assembly and disassembly. These studies will offer insight into the role of PrLDs in normal granule dynamics, and the mechanism by which mutations affect similar disease-relevant proteins.

### 39 Comparing Snowpack Surface Roughness Metrics with a Geometric Based Roughness Length

GEORGE BORLESKE

Department: Mathematics

The snow surface is the interface between the atmosphere and the earth. It is very dynamic and varies spatially and temporally. Its roughness influences turbulence and is used to estimate the sensible and latent heat fluxes to and/or from the snow surface to the atmosphere. We use airborne lidar-derived snow surface measurements from the NASA Cold Land Process Experiment Fraser Alpine intensive study area (ISA)

collected in late March 2003. Roughness metrics, including the random roughness, autocorrelation, and fractal dimension were computed, and compared to the geometric-based roughness which was derived using the Lettau formulation.

### 40 Dispelling Myths of Aging to Promote Health: The AgingPlus Program

ALLYSON BROTHERS

Department: Human Development and Family Studies

AgingPlus is a new intervention program designed to promote a healthy aging trajectory in mid-and late life. The program is based on solid evidence showing that negative attitudes toward aging often prevent individuals from engaging in health-promoting behaviors (e.g. physical activity), thereby threatening their own health and independence in later life. This project describes the rigorous development of the AgingPlus program, and reports the feasibility study results (N=63). The strong initial findings support the continued refinement and evaluation of the intervention program. This work addresses key attitudinal factors to increase participants' active participation in their own healthy aging.

### 41 Development of a Cell-Penetrating Supercharged Nanobody Scaffold for Intracellular Targets

GINNY BRUCE

Department: Chemistry

Supercharged proteins potentially penetrate mammalian cells, giving them unique potential as exogenous proteinaceous reagents that target intracellular receptors. One major challenge is the delivery of supercharged proteins. Our hypothesis includes protein nanocages to be engineered to mask supercharged proteins and abolish their immunogenicity, while targeting the delivery of supercharged proteins to diseased cells. The second major challenge is that supercharging a protein is non-trivial. We hypothesize that a single supercharged nanobody scaffold can be used to develop a library of cell-penetrating protein drug leads and basic research tools that target disease relevant intracellular receptors, including those challenging to small molecule drugs.

### 42 Analysis of Donor/Acceptor PAH'/PAH(CF<sub>3</sub>)<sub>n</sub> Charge-Transfer Complexes

ERIC BUKOVSKY

Department: Chemistry

Polycyclic aromatic hydrocarbons (PAH) and derivatized PAH's have applications ranging from organic electronics to paints and coatings. Herein we present the synthesis, and characterization of PAHs substituted with multiple electron-withdrawing CF<sub>3</sub> groups forming families of high electron affinity PAH(CF<sub>3</sub>)<sub>n</sub> compounds. These PAH(CF<sub>3</sub>)<sub>n</sub> compounds form highly-colored charge-transfer complexes with un-derivatized PAHs in solution and the solid-state. Additionally, the optical absorption, solution and solid phase stoichiometry, and solid-state packing motifs of a number of (PAH')<sub>m</sub>/PAH(CF<sub>3</sub>)<sub>n</sub> complexes will be discussed. The importance of this research is synthesis of novel n-type organic semiconductors and their use in precisely tuning energy levels in donor/acceptor systems.



## 43 Farm-Level Decisions: an Australian Cattle Herd

ANNE BYRNE

Department: Agricultural and Resource Econ

This study employs a single-objective linear program to determine farm-level decisions in the Australian Outback over a four-year planning horizon. It focuses specifically on a cattle farm with cows, heifers, and steers. The purpose is to examine the base case for a study that will seek to analyze the relationship between grazing practices, locust infestation and profitability. The plan detailed in this study examines a cattle-only herd where stocking rate is adjusted and optimal values are calculated in order to maximize profit given a maximum stocking rate.

## 44 The Importance of Incorporating Jazz into the Elementary Music Education

ELI CAGEN

Department: Music, Theatre, and Dance

The far-reaching positive influences which jazz can have on young people is worthy of attention. Young children are uninhibited emotionally and at an age where improvisation comes very naturally to them – whether it be with the voice, the body, or a simple instrument. If people are able to recognize the deep value of incorporating jazz into general music, which includes fostering a deeper appreciation for a greater spectrum of music, stimulating creativity through improvisation, and exposure to a broader historical and cultural perspective, the discussion can then move more easily into how educators may bring jazz into their classrooms.

## 45 Evaluation of Freeze-Dried Platelet-Rich Plasma in Cartilage under Inflammatory Conditions

LIVIA CAMARGO GARBIN

Department: Clinical Sciences

Platelets products as platelet lysate (PL) release numerous growth factors when activated that can mediate tissue healing, including cartilage. However, the lack of practicability for PL application is an issue for its use. Based on this issue, our group performed a study comparing the effects of freeze-dried allogeneic PL to the fresh product in equine cartilage. We hypothesized freeze-dried allogeneic PL would not have detrimental effects on cartilage explants compared to frozen or autologous PL preparations. With this study we demonstrated a superior glycosaminoglycan production of the freeze-dried groups compared to the fresh. Future studies in vivo are necessary.

## 46 Phospho-Tau and Cofilin-Actin Rod Pathologies in Longitudinal Aging Study Subjects

ADLEI CARLSON

Department: Biochemistry and Molecular Biology

Cultured mammalian neurons treated with soluble forms of A $\beta$  most relevant to Alzheimer disease (AD) form cofilin-actin rods. Rods may occlude neurites and block transport, inducing synaptic loss. To investigate the role rods might play in AD, we examined short postmor-

tem interval (<4 h) samples of frontal cortex and hippocampus from nearly identical regions of subjects enrolled in a longitudinal study. We prepared 30  $\mu$ m frozen sections, immunostained them for cofilin and phosphorylated tau protein, and quantified rod numbers, rod areas and tau neuropil thread areas. In the hippocampus of some subjects, rod pathology is significant.

## 47 The Vernacular Rhetoric of and Audience Responses of the Debut

ANIKA CASEM

Department: Communication Studies

Through the use of critical analysis and audience analysis to explore Filipina/o American identity in the Fil-Am film *The Debut* (2000), I argue *The Debut* showcases several identities consisting of a both/and quality that allows the invisible Fil-Am community to maintain an identity at odds with itself. Through audience analysis students discussed relevance of the experiences in the film in their lives. The conclusion finds that we need to continue educating about film representations, researching on vernacular discourses, ethnic audiences, and focus groups, cultivating appreciation in the Fil-Am community for film as art, and creating of more films by Fil-Ams.

## 48 Development of a Nutrition Program for Overweight and Obese Individuals

SHELBY CHANDLER

Department: Food Science and Human Nutrition

Background: Development and evaluation of group intervention programs are vital to decreasing obesity trends. Methods: Formative evaluation led development of a theory-based weight loss program. Participants were recruited for two intervention groups. Attitude and body composition were measured and sessions were observed to evaluate fidelity. Results: 23 overweight/obese adults successfully completed the program. Participants improved their attitudes and lost an average of 1.68 pounds. Fidelity was achieved between the two different instructors. Further Research and Implications: This pilot provided insight into weight management program development. Further research should increase physical activity components and include tools evaluated for reliability and validity.

## 49 Protein Resurfacing as a Method for Targeting “Undruggable” Proteins

ALEX CHAPMAN

Department: Chemistry

Interactions involving the ankyrin repeat oncoprotein Gankyrin are linked to aberrant cellular events and numerous cancers. However, Gankyrin presents a dramatic challenge to small molecule drug discovery due to its large, featureless binding face. We screened a large library of resurfaced proteins using split-superpositive GFP reassembly and identified mutants that bind Gankyrin in a complex cellular environment, and in vitro. Furthermore, iterative yeast display screening was used to identify low nanomolar binders, which are being assessed for Gankyrin inhibition. We also employed a grafting strategy to solubilize S6 ATPase, and characterize its interaction with Gankyrin using isothermal titration calorimetry (ITC).

## 50 Comparison and Acceptability of Gluten-Free Quinoa Yeast Breads

CARALINE CHASE

Department: Food Science and Human Nutrition

Most GF yeast breads on the market are made with a large portion of white or brown rice flour, which is neutral in taste, easily digestible, but low in vitamins and nutrients compared to quinoa flour. The objectives of this study were to develop GF yeast bread formulas incorporating quinoa flour for rice flour and potato starch at 0, 36, 72, or 100% and obtain sensory and instrumental data on the breads. Based on the instrumental and sensory data collected, both the 36 and 72% QF yeast breads are acceptable GF yeast bread options containing QF.

## 51 Recent Trends in In-vehicle Embedded Systems

MANOJ REDDY CHEMARLA

Department: Electrical and Computer Engineering

The idea is to provide a general survey of literature on ongoing trends in automotive embedded systems. A comprehensive review is conducted on the latest automotive technology trends, procedures, techniques in the last two decades and detailed descriptions of these methods are presented.

## 52 Absence of Endogenous Feline Leukemia Virus in Wild Felids

ELLIOTT CHIU

Department: Veterinary Med and Biomed Sci

Feline Leukemia Virus (FeLV) is a contact-dependent RNA virus that causes a wide degree of disease states, and represents one of the most common fatal infectious diseases of domestic cats. While FeLV is not considered an endemic virus of wild felids, individual cases and outbreaks resulting in high morbidity and mortality have been recorded in species of conservation concern. The purpose of this study is to determine how endogenous elements important to disease progression in domestic cats that are absent in wild felids impact the viral infection and disease potential of the virus in vivo.

## 53 Development of an Online Training for EFNEP Paraprofessional Nutrition Educators

MICHELINE CHLIPALSKI

Department: Food Science and Human Nutrition

Objective: To develop an on-line training on the Eating Smart and Being Active Eating During Pregnancy Lesson for paraprofessional nutrition educators. Methods: Expanded Food and Nutrition Education Program (EFNEP) supervisors and paraprofessional educators were interviewed to determine their learning preferences for this training. Scripts and story boards were designed, reviewed and used to film training videos. Evaluations of the on-line training will include a pre-/post-tests. Implications: Reporting lessons learned from the development of this on-line training, as well as publishing the results from its evaluation, will enhance the scarce literature currently available about training EFNEP paraprofessional nutrition educators.

## 54 Language Skills Integration into Lesson Planning

YUNJU CHOI

Department: School of Education

This paper aims to investigate how to design a lesson plan for ESL classes focusing on mainly three areas. First, teachers should be more careful to integrate five language skills in lesson plans. Second, teachers should consider what important parts are in lesson plans referred in the previous research. Third, ESL teachers should be considerate to set content and language objectives to better meet students' diverse needs. For this study, previous researches are reviewed to get general information about this agenda, and then ideas from my class discussion and my personal experiences as an ESL teacher and learner are included.

## 55 Dengue Virus Infection Induces Lipid Alterations in Aedes Aegypti Mosquitoes

NUNYA CHOTIWAN

Department: Microbiology, Immunology and Pathology

Aedes mosquitoes are the essential vector for transmitting dengue virus (DENV) among human populations. Unlike in humans, DENV infects and replicates in the mosquito without causing detrimental effects indicating that the virus-host interactions benefit both vector survival and virus replication. Our study has explored global metabolic changes in the Aedes aegypti midgut and salivary glands upon DENV2 infection. We have found several significant fluctuations in the lipid repertoire from infected tissues. These lipids function as membrane building blocks, bioactive messengers, energy storage molecules and intermediates in lipid metabolic pathways. Its relevance to DENV infection in the mosquito will be discussed.

## 56 Derivation of MSC from Canine Induced Pluripotent Stem Cells

LYNDAH CHOW

Department: Interdisciplinary - Cell and Molecular Biology

Mesenchymal Stem Cells (MSCs) are used for their immunosuppressive properties and ability to differentiate into mesenchymal-lineage tissues. Using ciPSCs to derive MSCs will provide a more easily accessible population that has been uniformly screened and verified, and can be propagated for multiple generations. We propose a small molecule treatment of canine induced pluripotent stem cells that will allow for simple and large scale derivation of MSCs to be used for clinical applications.

## 57 The Tip-of-the-Tongue Heuristic: Inferring Fluent Characteristics

ALEX CLAXTON

Department: Psychology

This study shows that the presence of a tip-of-the-tongue (TOT) state is used as a heuristic for inferring that an inaccessible word has characteristics that are consistent with greater word perceptibility (i.e., darker and clearer, larger, or a high frequency word). This was not because greater fluency or word perceptibility at encoding led to later TOT

states. Results instead suggest that TOT states themselves are used as a heuristic for inferring the likely characteristics of unretrieved words. This research provides an additional explanation for the additional information that people seem to have access to while experiencing a TOT state.

## **58 Dynamic Assemblies of Gold Nanoclusters Enabled by Surface Modifications**

**SCOTT COMPEL**

Department: Chemistry

Gold nanoparticle self-assembly is almost always mediated by thiol-anchored ligands which result in static and stable structures. We report generalized assembly of gold nanoclusters by the non-thiolate ligand diglyme into discrete and dynamic structures. Incorporating a molecule of diglyme into the particle shell enables assembly through weak oxygen-gold interactions between diglyme and cluster cores. This model is validated by chromatography, mass spectrometry, spectroscopy, calorimetry, and electron microscopy. Resulting assemblies possess emergent optical, electronic, and structural properties. This new generic route for dynamic assemblies of gold nanoparticles has applications in sensing, plasmonics and biology that are absent in discrete metal nanoparticles.

## **59 Engineers Without Borders Challenge USA**

**ALISTAIR COOK**

Department: College of Business

The EWB Challenge is an existing design program for first-year University Engineering students coordinated by Engineers Without Borders (EWB) - Australia and delivered in partnership with EWB - UK and EWB - New Zealand. Students from CSU's Global Social and Sustainable Enterprise MBA program worked with Engineers Without Borders USA to assess the feasibility of offering the program to approximately 200 engineering schools in the United States and how to create the operational and financial structure to allow for its implementation.

## **60 Interest Group Influence on EPA Climate Policy**

**JEFF COOK**

Department: Political Science

The Environmental Protection Agency (EPA) has been at the forefront of national climate policy, through the promulgation of administrative rulemaking. The role stakeholder groups have played in influencing this policy is unclear, particularly during the notice and comment stage of the rulemaking process. I employ logistic regression to determine which stakeholder groups are more likely to exert influence in this policy area. I conclude that state agencies and business interests wield more influence over the EPA than other interests. The agency is also more responsive to those groups that offer more technical comments.

## **61 Sensory Processing among Children with High-Functioning Autism Spectrum Disorders**

**JEWEL CRASTA**

Department: Occupational Therapy

This study examined whether children with high-functioning autism spectrum disorders (ASD) differ from typically developing children on neurophysiological measures of auditory information processing. EEG recordings were obtained from fifteen children with ASD and 15 typically developing children, while they heard random presentations of four auditory stimuli at two different frequencies and intensities. An analysis of variance for the amplitude of P3 component and t tests for the amplitude of N2 component revealed significant differences between the groups. These findings shows that children with ASD display different brain processing mechanisms to auditory sensory stimuli compared to typically developing children.

## **62 Adult Learners in Higher Education**

**CASSY CRAWFORD**

Department: School of Education

Higher education is expanding to meet the growing needs of a student population that is projected to grow exponentially: adult learners. What is an adult learner? What barriers do they face in higher education? Why is there a need for further research and data regarding these learners? Adult learners encompass a broad demographic with unique challenges and diverse needs. The policies in place that support traditional students can potentially be expanded to further support the identified needs of adult learners and strategies already in place can potentially be further developed for the success of this growing student population.

## **63 Evolving New RNA-Binding Therapeutics to Treat HIV**

**DAVID CRAWFORD**

Department: Chemistry

RNA plays an important role in almost all biochemical processes in both normal and disease-affected cells. Due to this broad importance, RNA has emerged as an important therapeutic target. However, all RNA is chemically similar, which makes targeting RNA difficult with traditional small molecule therapeutics. This problem has been solved in specific instances by a variety of naturally-occurring proteins which bind specific RNAs within their systems. The goal of our research is to use these highly-specific RNA-binding proteins as a starting point to evolve therapeutics which target disease-relevant RNAs.

## **64 Probing Structural Features of Self-Assembled Asphaltenes Using 2D IR Spectroscopy**

**JENEE CYRAN**

Department: Chemistry

Asphaltene aggregation is a problematic process causing refinery pipes to corrode and clog. Asphaltenes are molecules from oil described by their solubility roles: soluble in toluene and insoluble in n-hexane. The molecular weight and structure of asphaltenes are highly debated, however, researchers agree that they are composed of polycyclic aromatic hydrocarbons (PAHs). UV-vis, linear and nonlinear vibrational spectroscopies, including two-dimensional infrared spectroscopy (2D

IR), are used to explore the structure of the aggregates. This study concluded that there are ~6 molecules per aggregate for violanthrone. This approach allows an understanding of the self-assembled structure of model asphaltene aggregates.

## **65 Gait Analysis of Mice Using Image Processing**

**PRANAV DAMALE**

Department: Electrical and Computer Engineering

Gait Analysis of Mice Using Image Processing is a project which involves neurological study of mice gait using Digital Signal Processing techniques for high accuracy observations. The case study involved in this project is based on motor sensory disorders caused by damaged central neural system in a mice brain. The case study verified the use of potential new antidote restricting neural damage. The project also uses machine learning techniques to automatically classify neurally damaged mice from healthy mice based on their gait which can be useful for early detection of sickness caused by damaged neural system.

## **66 Semi-Supervised Classification of Terrain Features in Polarimetric SAR Images**

**STEVE DAUPHIN**

Department: Mathematics

In an effort to enhance image segmentation and classification of terrain in a fully polarimetric SAR image, this work explores making use of two state-of-the-art polarimetric decompositions, hand-selecting pixels to define terrain classifications of interest, then comparing the decomposition outputs of every pixel in the image to the training data and returning an image in which every pixel is assigned to one of the hand-selected terrain classifications or remains unclassified. This work uses a novel probabilistic fusion process to accomplish the classification. This work will aid polarimetric SAR analysts by quickly categorizing large sets of images.

## **67 Novel In Vitro Assessments of Prion Disease Species Barriers**

**KRISTEN DAVENPORT**

Department: Veterinary Med and Biomed Sci

Prion diseases are unique among protein misfolding disorders in their transmissibility within and between species, but the mechanisms that dictate cross-species transmissibility are poorly understood. Here, we show that prions derived from infections with bovine spongiform encephalopathy (BSE, mad cow disease) have similar species-crossing characteristics, while prions derived from chronic wasting disease (CWD) infections are more likely to adapt to the new host and not maintain the original CWD characteristics. Because these experiments rely on protein-protein interactions, these results support the critical role for prion structure in determining the propensity for cross-species prion transmission.

## **68 Mimicking Chronic Hypo- and Hyperglycemia in Engineered Cultures of Hepatocytes**

**MATT DAVIDSON**

Department: Interdisciplinary - Bioengineering

Liver hepatocytes maintain glucose homeostasis by storing and secreting glucose to keep an efficient range (3.9-6.1mM). High blood glucose due to insulin resistance is associated with diabetes and non-alcoholic fatty liver disease, which can lead to liver cirrhosis/cancer. Conversely, fasting, and metastatic liver cancer can cause low glucose. To aid development of safe therapies for diabetes/cancer we aim to understand how glucose levels affect hepatocytes. Hepatocytes cannot be maintained long outside the body, but we have microengineered a long-term culture platform that does just that. This platform identified significant changes in hepatocyte metabolism induced by chronic low and high glucose.

## **69 Anti-Racist and Anti-Linguist Action in the CSU Writing Center**

**LESLIE DAVIS**

Department: English

This paper looks at the work done in the CSU Writing Center, and how racist or linguist attitudes may manifest themselves in the interactions between consultants and students. While these attitudes may take the form of microaggressions, they may also show up covertly in staff discussions of working with English language learners (ELLs). While it is important to recognize the ways that we at the Writing Center may be perpetuating racist or linguist attitudes during consultations, the CSU community as a whole must also be brought into the process of self-examination and reflection, specifically regarding academic writing standards.

## **70 Steps towards Global Food Security through Plant-Microbe Interactions**

**EMILY DELOREAN**

Department: Bioagricultural Sci and Pest Mgt

Rice is one of the most important staple crops worldwide and critical to global food security. However, a rice pathogen, called bacterial blight, can cause up to 70% yield loss in infected fields. Therefore, control of this disease is necessary in sustaining and increasing rice production. Because bacterial diseases, especially bacterial blight, are difficult to control with farm management practices the best defense is within the genetics of the rice itself. Uncovering the genetics behind the plant-microbe interactions can help us find ways to help our rice resist infection and thereby help obtain global food security.



## **71 Metamemory Differences between Alzheimer's and Frontotemporal Dementia: A Systematic Review**

**SARAH DELOZIER**

Department: Psychology

Clinicians have difficulty distinguishing between various forms of dementia to achieve a correct diagnosis. Little research has been done to examine whether anosognosia, or failure to acknowledge one's deficits, might differ between dementia diagnoses, thereby providing a means of differentiating between dementia subtypes. This review focused on examining differences in monitoring of one's memory, or metamemory, amongst two of the most common types of dementia: Alzheimer's disease and frontotemporal dementia. Greater monitoring deficits were apparent in frontotemporal dementia than in Alzheimer's disease, suggesting that metamemory may be used as an effective, low-cost means of achieving more accurate clinical diagnoses.

## **72 Habitat Use of an Alaskan Dall Sheep Population via Camera-Traps**

**JEREMY DERTIEN**

Department: Interdisciplinary - Ecology

The study of Dall sheep (*Ovis dalli dalli*) is often constrained by variable terrain, extreme climate, and at times cryptic nature of the species. Camera traps are an increasingly utilized for the study of numerous taxa of wildlife. My study utilizes camera-traps to determine the occupancy of Dall sheep and other mammals within the U.S. Army's Fort Wainwright, Alaska. Over ten-thousand images of sheep and other mammal species were captured by both time lapse and movement triggers. These data allowed for occupancy modeling of sheep and overall mammalian habitat use, which will ultimately inform U.S. Army military training.

## **73 Mathematical Constructs for a Decision Making Algorithm in Smart Home**

**MARVIN ANTONY DEVADASS**

Department: Electrical and Computer Engineering

Load scheduling in the Smart Home offers benefits such as avoiding peak pricing, decreasing fossil fuel generation and increasing the percentage of renewable energy in the grid. In this project, a mathematical framework is created for load scheduling algorithm based on customer's preferences. This is achieved by using techniques such as Analytical Hierarchy Process (AHP) and Piecewise cubic hermite interpolating polynomial (Pchip). Considering customer's preferences, loads are run at an optimal time when prices are cheaper. Implementation of this technique would provide benefits to the customers and utilities by cost reduction and more penetration of green energy in the grid.

## **74 Characterization of Exosomes Released from Macrophages Infected with Mycobacterium Tuberculosis**

**GUSTAVO DIAZ**

Department: Microbiology, Immunology and Pathology

Discovery of tuberculosis biomarkers is a worldwide public health priority. Our laboratory demonstrated that exosomes isolated from *Mycobacterium tuberculosis* (Mtb)-infected patients contained myco-

bacterial peptides (potential biomarkers for tuberculosis). The highly complex population of exosomes found in human serum hinders the Mtb biomarkers identification. A platform for a selective isolation of exosomes containing Mtb biomarkers is needed. Using a novel biotinylation strategy, our proteomics analysis identified six human proteins more abundant in the membrane of exosomes from Mtb-infected macrophages. Using these proteins, our next step will be to develop a platform to concentrate exosomes containing Mtb molecules from human serum.

## **75 Experimental Optimization of a Biomass Cookstove for Emissions Reduction**

**KEVIN DISCHINO**

Department: Mechanical Engineering

Currently, around 3 billion people cook by burning biomass. Unfortunately, traditional biomass cooking technologies are afflicted by high levels of Particulate Matter (PM) emissions. PM emissions from biomass burning contribute significantly to household air pollution, the fourth largest health risk in the world, and global climate change. In order to alleviate this problem, an experimental study of novel forced draft technology in a "rocket elbow" style biomass cookstove was completed under a Department of Energy grant. This work has led to the development of a robust technology and early stage consumer product with substantial PM emissions reductions.

## **76 Systems of Power in the U.S. Foreign Intelligence Surveillance Act**

**KATHERINE DOGETT**

Department: Communication Studies

As issues of privacy and security become increasingly complex, government practices regarding the acquisition of information have been debated. This study analyzes the rhetoric of the 2010 U.S. Foreign Intelligence Surveillance Act (FISA) to investigate some of the many power dynamics that are constructed through the language in the document. Using Foucault's discussion of power/knowledge, I suggest that the language in FISA enacts strategies that reinforce an image of a dominant and exclusive United States, while othering foreign individuals/groups by diminishing the rights available to them. This analysis supports future research on the contrasting rhetoric of "domestic" and "foreign" affairs.

## **77 The Ideological State Apparatus and the Construction of National Memory**

**NATALIE DOLLISON**

Department: College of Liberal Arts

My research explores the publicly funded, ideological narrative told through national monuments and state historical markers. I contend that these sites of national memory create racialized spaces which normalize aggressive military action and white supremacy. My presentation will include an overview of my findings and make connections based on the philosophy of Louis Althusser, in which I will explore how publicly funded national monuments act as an Ideological State Apparatus, and how such rampant, yet insidious ideology affects how the Repressive State Apparatus disciplines people of color in the United States.



## **78 Montbello Conservatory of Expeditionary Learning: Innovative K-12 School in Denver**

**DEB DOMRES**

Department: School of Education

Montbello Conservatory of Expeditionary Learning (MCEL) is a proposed K-12 Innovative Charter school that will serve not only the students in far northeast Denver but also their families and community. The effort is being driven by a need for a high performing, innovative school model which values diversity, community, family, health, and the environment. MCEL is designed to create a school within a school. The Conservatory is intended to transcend physical brick and mortar buildings; it will become part of the community as a living - learning center within the community.

## **79 Pathogen Detection in Food Production Systems Using Shotgun Metagenomics**

**ENRIQUE DOSTER**

Department: Microbiology, Immunology and Pathology

The goal of this study was to explore the use of metagenomic data to detect food-borne pathogens in a variety of cattle production settings. Environmental fecal, soil and water samples (n=34) were collected from organic and conventional dairies, US and Canadian feedlots, and a Canadian ranch. Total DNA was extracted and shotgun sequenced on the Ion Proton. Results indicate that trace amounts of important food-borne pathogens are present in all cattle production environments, though the biological relevance of detecting pathogenic sequences is still undetermined. These findings highlight both the opportunities and the challenges of using shotgun sequencing for pathogen detection.

## **80 The Experiences of International Spouses in the United States**

**ADINA DUMITRACHE**

Department: Human Development and Family Studies

Many international students and researchers are accompanied by their spouses and children when they move to USA. Cultural shock and social isolation are some of the problems faced by these dependents while abroad. The present study looked at the career and educational trajectories of foreign dependent spouses of students and researchers in the USA. Though typically well-educated and career-oriented people in their native countries, international spouses face several barriers when trying to find a job or apply to school in the USA: finances, visa status, and language proficiency. As housewives, many deal with identity crises, anxiety, and depression.

## **81 Mindfulness Interventions for Children and Adolescents with ADHD**

**RACHEL EBY**

Department: Psychology

With prevalence rates of children meeting criteria for Attention Deficit/Hyperactivity Disorder being 7-10%, there is increased call for effective early intervention to increase coping skills for people with ADHD. Recent studies have lauded the benefits of mindfulness interventions for many physiological, psychological, and behavioral issues, including

attention. A combined search of the PsycInfo and Medline databases (through December 2014) was conducted using the search terms attention deficit and mindfulness, and yielded 5 articles published between 2004 and 2013 for systematic review. Results of this review are discussed as well as limitations and directions for future research.

## **82 Genetic Susceptibility Loci for Lung Cancer Malignancy and Metastasis**

**ELIJAH EDMONDSON**

Department: Microbiology, Immunology and Pathology

The underlying genetic host factors that contribute to the malignant features of cancer are important as they may allow for improved individualized risk assessments and personalized medical therapies. Accumulating evidence suggests that heritable genetic variability can predetermine a tumor cell's propensity to metastasize, be chemoresistant, or develop into a tumor of higher histologic grade. Pulmonary sarcomatoid carcinomas are an example of a highly aggressive form of lung cancer. The present study identifies genetic loci that are associated with the transition from pulmonary adenocarcinoma to pulmonary sarcomatoid carcinoma, a more malignant form of lung cancer with increased incidence of metastasis.

## **83 Ecotourism to Fund Conservation in the Peruvian Amazon**

**AUDREY EK**

Department: Human Dimensions of Nat Res

The purpose of our project is to explore alternative markets to fund a REDD+ initiative in the Tambopata National Reserve, Madre de Dios, Peru. We examined the feasibility of local stakeholders in the tourism sector purchasing carbon credits. After analyzing responses from international tourists who had visited the reserve and tour operators doing business in the buffer zone of the reserve, we determined that there is an interest in carbon market participation. Due to the oversupply of carbon credits on the voluntary market, and the constant supply of tourists visiting the area, this market should be further explored.

## **84 Power of Avatar Gender Choice on CMC in Guild Wars2**

**RILEY ELLIS**

Department: Foreign Languages and Literature

Through ethnographic investigation within the virtual world of Guild Wars 2, research demonstrates that avatar gender choice fosters subjective well-being for both men and women in that men are able to show more emotion (in the form of emoticons, word choice, apologies, etc.) than what is socially acceptable in real-life and that, simultaneously, women are not suppressed to hide their emotions. Concurrently, gender-based communication, specifically observed through the use of emoticons, is present in-game as players linguistically assimilate to their avatar's gender, which contributes to positive subjective well-being in that social play between players is not interrupted by misleading communication.

## **85 Natural Rate of LNAPL Losses under Anaerobic Conditions**

**ERIC EMERSON**

Department: Civil and Environmental Engineering

Historical releases of petroleum liquids to soil and groundwater underneath petroleum facilities are a persistent problem. Predicting the longevity of petroleum liquids in subsurface settings is emerging as a factor in selecting remedies. It is the purpose of this research to examine the hypothesis of a zero order loss rate independent on the amount petroleum remaining. Verification of a zero order rate will provide development of tools to support sound decisions for impacted sites.

## **86 Floral Attractiveness of Native versus Introduced Populations of *Verbascum Thapsus***

**STACY ENDRISS**

Department: Interdisciplinary - Ecology

Two important unanswered questions in ecology are: does flower morphology change when plants are introduced into new ranges, and how do pollinators respond to such changes? To answer these questions, I grew native and introduced populations of *Verbascum thapsus* in a common field environment. Data were collected on floral characteristics and the rate of honeybee visits to flowers. Introduced populations of *V. thapsus* had larger flowers and were visited by bees more often than native populations, although the strength of this finding depends upon exposure to herbivory. Overall, introduced populations of *V. thapsus* have evolved greater attractiveness to pollinators.

## **87 In Vivo Expression of Programmed Death Ligand-1 by Canine Tumors**

**ERICA FAULHABER**

Department: Clinical Sciences

Programmed cell death ligand 1 (PD-L1) is a cell surface molecule expressed by tumor cells and by tumor infiltrating macrophages. Rodent models and human trials have shown that blocking the interaction between PD-L1 and PD-1, its receptor on T cells, augments anti-tumor immunity and leads to inhibition of tumor growth. Therefore, a better understanding of tumor PD-L1 expression by canine tumors is an important first step in targeting this molecule for tumor immunotherapy. The primary study objective was to determine the expression patterns of PD-L1 by a representative panel of canine tumor biopsies.

## **88 West Nile Virus Surveillance in Fort Collins, 2006-2013**

**JOSEPH FAUVER**

Department: Microbiology, Immunology and Pathology

West Nile Virus (WNV) was first detected in Colorado in 2002 and caused a major epidemic in the eastern portion of the state in 2003. The virus subsequently spread to the rest of Colorado and is maintained on the Front Range through an enzootic cycle involving passerine birds and *Culex tarsalis* and *Cx. pipiens* mosquitoes. In this study, we use historical trap data to elucidate trends during years and between years. Also, we aim to determine if the City of Fort Collins is homogeneous for 3 entomological measures: (1) *Culex* abundance, (2) infection rate, and (3) vector index.

## **89 Biogeochemical Inputs of Periglacial Features under Warming Alpine Climate Conditions**

**TIMOTHY FEGEL**

Department: Interdisciplinary - Ecology

Alpine ice glaciers in the American West are projected to be non-existent within the next 100 years, while rock glaciers will continue to maintain ice and contribute to alpine hydrology for much longer. There is little research comparing the biological and chemical inputs of alpine rock glaciers and ice glaciers to headwater ecosystems. In our comparative study of organic chemistry and biology from North American glaciers and rock glaciers, we hypothesized that: 1. Weathering products will be greater from rock glaciers than ice glaciers. 2. Differences in microbial communities between glaciers types may result in differential processing of reactive elements.

## **90 Ecological Consequences of Interactive Pulsed and Pressed Climatic Changes**

**ANDREW FELTON**

Department: Interdisciplinary - Ecology

Expected alterations to rainfall patterns from climate change include chronic changes to rainfall event size and number, as well as increases in the frequency and intensity of drought. However, to date few studies have attempted to assess how the legacies from these chronic and pulsed changes may influence ecosystem sensitivity to future drought events. In an intact tallgrass prairie in Northeastern Kansas, two experiments - a 15-year rainfall manipulation experiment (RaMPs) and the Climate Extremes Experiment (CEE) left such legacies on the ecosystem. In 2014, these experiments were then exposed to the first of a two-year growing season drought.

## **91 Meniscal Glycosaminoglycan Changes Due to Knee Joint Trauma**

**KRISTINE FISCHENICH**

Department: Interdisciplinary - Bioengineering

Using a traumatic tibiofemoral impact (ACLF) lapine model, glycosaminoglycan (GAG) coverage was assessed 12 weeks post trauma. Five skeletally mature Flemish Giant rabbits were used for this study. GAG coverage was evaluated and significant decreases ( $p < 0.1$ ) were found in both medial and lateral hemijoints. Results of this study have shown GAG coverage decreases 12 weeks post trauma. A decrease in GAG likely results in a decrease in elastic modulus. With damaged menisci unable to support and distribute the same compressive forces, more force will be concentrated on the articular cartilage, leading to cartilage degradation and the development of osteoarthritis.

## **92 Personal Disclosure on a Body Dysmorphic Disorder Online Support Forum**

**EVE FISHER**

Department: Journalism and Technical Communication

The current study used qualitative content analysis to explore how individuals with body dysmorphic disorder (BDD) communicate with their peers online. The study examined 911 messages posted by 225 participants on a support forum for individuals with BDD. Personal

disclosure about having BDD (appearance, behavior, and impact on relationships) and recovery from BDD (treatment and diagnosis) were the most frequent communication exchanges on the forum. As a result of the study findings, health communication scholars will have an increased understanding about how individuals with BDD communicate with their peers online about the disorder.

### 93 Carbon Dioxide induced Pulmonary Hemorrhage

SUHRIM FISHER

Department: Microbiology, Immunology and Pathology

Carbon dioxide (CO<sub>2</sub>) is the most commonly used method of euthanasia for rodents. AVMA Guidelines recommend CO<sub>2</sub> displacement rate of 10-30% per minute and recommend against placing conscious animals in prefilled chambers. An investigator reported pulmonary hemorrhagic lesions in BALB/c mice euthanized with slow-fill method that were not previously observed with prefilled method. This study aims to determine whether or not slow-fill CO<sub>2</sub> euthanasia method induces pulmonary lesions in BALB/c and C57BL/6 mice compared to prefilled method. Our findings showed that slow-fill CO<sub>2</sub> euthanasia method induces pulmonary and nasal hemorrhage in BALB/c mice compared to prefilled method.

### 94 Conceptualizing Transnational Democratic Networks

DESIREE FISKE

Department: Political Science

Democratic theory has recently found itself in a 'deliberative turn.' Extending beyond capacities maintained by state institutions, deliberative democratic theory may be understood as necessary for conditions of democracy to move beyond the bounds of the nation-state to incorporate conditions of globalization. As global governance literature recognizes nuanced abilities to regulate through private and public interactions, the democratic voice of citizens is in shift. Merging democratic, globalization, and transnational network theories, the presented project informs transnational democratic theory with empirical case study observations of World Wide Views on Biodiversity, the second transnational citizen deliberation conducted on a global scale.

### 95 Atheist Student Perspectives on Spirituality in Social Work Education

JO FJELSTROM

Department: School of Education

The social work curriculum includes content on spirituality in order to prepare students to address issues about religion and spirituality that may arise in practice. Although the percentage of persons holding atheist worldviews continues to increase, the literature predominantly reflects theistic and other supernatural views of spirituality, and non-theistic perspectives have rarely been mentioned in social work education. This study explores the perspectives and experiences of atheist university social work students about spirituality. The purpose of the study is to provide data about atheist perspectives and to provide ideas for incorporating non-theist perspectives into the social work curriculum.

### 96 MR1 Bearing B-cells, Effector MAIT-Cells, and John's Disease

DARCY FLETCHER

Department: Microbiology, Immunology and Pathology

Paratuberculosis, caused by *Mycobacterium avium* subsp. *paratuberculosis*, is a chronic infection of the intestine in ruminants with a late onset of the clinical stages. There is still a large knowledge gap on how the host controls the infection at the local, intestinal level. One of the potential mechanisms is the MR1-restricted MAIT system. Most of the resources were developed for the human model and no cross-reactivities with other animal model were yet reported. Here we present our findings on the cross-reactivities with the bovine system.

### 97 Implementing Biological Halogen Bonds into a Molecular Dynamics Force Field

MELISSA FORD

Department: Biochemistry and Molecular Biology

Recently, there has been a resurgence of the significance of halogens in biological contexts; particularly in pharmaceuticals, halogens increase affinity and specificity. The drug design process must be both accurate and time-efficient, yet current programs cannot satisfy both of these criteria for halogens. We have developed and parameterized an empirical force field for biological halogen bonds (ffBXXB). From this, we discovered a one-to-one correlation with the energies found experimentally. In the future, we will implement the ffBXXB into drug design programs, which will make it the first force field to accurately predict halogen bond energies without the need for time-consuming calculations.

### 98 A Modular Platform for EEG Analysis and Real-Time Brain-Computer Interfaces

ELLIOTT FORNEY

Department: Computer Science

Brain-Computer Interfaces (BCI) are systems for establishing a direct channel of communication between the brain and a computerized device. BCI may have a number of important applications, such as the development of assistive devices, predicting the onset of epileptic seizures and augmenting communication channels in virtual environments. Unfortunately, however, current software tools are not suitable for the rapid development of novel BCI technologies. In order to overcome this issue, we have developed a new software platform, called CEBL that is designed to be used by BCI researchers through all phases of development, from offline proof-of-concepts to real-time prototypes.



## **99 Navy Beans Modulate Lipid and Carbohydrate Metabolism in Healthy Dogs**

**GENEVIEVE FORSTER**

Department: Clinical Sciences

Beans (*Phaseolus vulgaris*, L.) such as navy and black, demonstrate potential to improve health and prevent chronic diseases in humans and lab animals. We hypothesize that companion dogs may also derive health benefits from consuming beans and have demonstrated the safety and feasibility of including beans as a major ingredient in dog diets. Here, we show that a 25% navy bean diet modulates serum cholesterol and fecal lipid and carbohydrate excretion in healthy dogs. Our data support that the unique phytochemical and fiber profile of the navy bean diets may promote healthy metabolism of lipids and carbohydrates in dogs.

## **100 Biochar Impacts on Enzymatic Nutrient Cycling under Limited Irrigation**

**ERIKA FOSTER**

Department: Interdisciplinary - Ecology

With the threat of drought conditions across the semi-arid west, innovative soil and water management can help adapt agricultural systems. Organic amendments, such as biochar and manure increase soil moisture and fertility, effecting the soil microbial community and nutrient cycling enzymatic activity. This corn field trial in northern Colorado demonstrated no impact of limited irrigation or manure on enzymatic activity, while biochar reduced phosphatase activity and increased soil moisture and yield. These results provide a stepping stone for analyses of a wider array of enzymes and exploring biochar as a viable management option for temperate agricultural systems under drought stress.

## **101 Write OPEN: Developing Open-Mindedness in High School Youth**

**JENNA FRANKLIN**

Department: English

Being critically open-minded is essential to successfully collaborating cross-culturally in our increasingly globalized society and within the microcosm of multicultural school environments. I plan to experiment in pedagogy and praxis by asking if open-mindedness can be developed in high schoolers and result in increased cross-cultural understanding and civic activism. As a pilot project for developing future curriculum, I am proposing a 2-week summer course, called Write OPEN (Writing for Open Perspectives and Engagement Now), for 10-15 voluntary students at Rocky Mountain High School in Fort Collins, Colorado in the summer of 2015.

## **102 Identifying Gene(s) that Make Plants Gigantic-1: Characterizing Rice Mutant (mpg1)**

**MICHAEL FRIEDMAN**

Department: Biologyogy

A T-DNA expression cassette was engineered and inserted into plants in effort to increase plant biomass for biofuel production efficiency. A single large plant was generated; further analysis of this insertion event led us to hypothesize that the insertion caused a mutagenic event altering the expression of a nearby gene. These plants averaged a 7.4-fold increase in biomass, and a 3.6-fold increase in seed yield, compared to

wild-type plants. Given the increase in biomass we refer to it as mpg1 (makes plants gigantic-1). Identifying the mechanism responsible for this phenotype could potentially serve other bioenergy crops of interest as well.

## **103 Sub-Sensory Vibration and Ankle Joint Movement Detection in Older Adults**

**MEGAN FRITZ**

Department: Health and Exercise Science

Impaired proprioception contributes to postural dyscontrol in aging. Very low amplitude tendon vibration can bring spindle afferents closer to threshold and may enhance detection of joint movement. Sub-sensory vibration may be able to mitigate some of the age-related deficits in ankle proprioception and reduce fall risk.

## **104 Shock Wave Therapy Accelerates Bone Formation under Simulated Microgravity Conditions**

**BEN GADOMSKI**

Department: Interdisciplinary - Bioengineering

There is a dramatic rate of bone loss, and consequently, increase in fracture risk due to the lack of gravity encountered during spaceflight. Our previous work utilizing a large animal model developed here at CSU has demonstrated markedly diminished fracture healing rates under microgravity conditions. Thus, it is imperative that countermeasures be established prior to sending astronauts to Mars. The current work investigated the use of shock wave therapy (SWT) as a means of increasing fracture healing rates. Our findings indicate that SWT may be a possible tool to combat the complications associated with fracture healing during future space missions.

## **105 On Minimal Restricted Sumsets in Finite Abelian Groups**

**WES GALBRAITH**

Department: Mathematics

Additive Combinatorics is a branch of mathematics concerned with the relationship between subsets of an abelian group and sumsets derived from them. Our work focuses on restricted sumsets, which only contain sums consisting of distinct terms. Interest in this area began with Erdos and Heilbronn, who conjectured a lower bound on the minimum size of a restricted sumset in finite cyclic groups of prime order. Dias Da Silva and Hamidoune later resolved this conjecture. Bajnok then provided an upper bound on minimum restricted sumset size in arbitrary cyclic groups. Here, we seek to extend his methods to non-cyclic abelian groups.

## **106 Recognition of DNA Lesions by the Archaeal RNA Polymerase**

**ALEXANDRA GEHRING**

Department: Biochemistry and Molecular Biology

DNA lesions are known to halt transcription in bacteria and eukaryotes. Blocking the progression of the transcription complex can be detrimental to cells, primarily by leading to double stranded breaks, and is known to cause diseases in humans. The archaeal RNAP has a strong sequence and structural homology to eukaryotic Pol II. We are able to

apply our understanding of the archaeal system to the eukaryotic system. Using an in vitro transcription system from the archaeal organism *Thermococcus kodakarensis*, we demonstrated that the archaeal RNAP is sensitive to DNA lesions.

## **107 Functional Performance in School-Aged Children with Down syndrome**

**BRIANNE GERLACH-MCDONALD**

Department: Human Devlpmt and Family Studies

Down syndrome (DS) is the most common neurogenetic syndrome associated with intellectual disability. Functional performance is the engagement in activities universal to all children-- such as self-care, mobility, and social interaction. This study examined the cognitive predictors of functional performance in children with DS. Results indicated that individuals with DS show a distinct profile of functional performance with relative strengths in mobility and relative challenges in self-care and social function. In addition, executive function was the most significant predictor of functional performance. These findings have implications for future targeted intervention for students with DS to promote optimal functional performance outcomes.

## **108 Intracellular Lipid Composition Impacts Dengue Virus Particle Infectivity**

**BECKY GULLBERG**

Department: Micrbiolgy, Immunolgy and Pathology

Dengue virus is the most aggressive arthropod-born virus worldwide. As a flavivirus it has a positive sense single-stranded RNA genome and a host cell derived lipid envelope. It replicates its genome in virally-induced invaginations in the endoplasmic reticulum. Fatty acid synthesis is increased during infection, but specific unsaturated fatty acids may be required to produce these highly curved membranes. We interrogated a library of siRNAs directed at the unsaturated fatty acid biosynthesis pathway. We have identified multiple hits and in particular, stearoyl co-A desaturase, the rate-limiting enzyme responsible for converting stearic to oleic acid, is critical for viral replication.

## **109 Violent Bodies: Identity and Physicality in Colorado's Vice Districts, 1860-1914**

**NIC GUNVALDSON**

Department: History

This master's project focuses on the changing moral and legal statuses of Colorado's vice districts during the nineteenth and early-twentieth centuries. The central argument of this project is that once vice districts became legally prescribed by progressive elites near the end of the century, they became more visible, and despite the intentions of reformers, these areas paradoxically became more vulnerable to eradication. In addition to traditional sources, this project will focus on the behavior and description of the human body in creating, navigating, and enforcing the boundaries of vice districts in order to illustrate a vivid historical reality in motion.

## **110 Aquatic Insects' Food Webs in Streams across Altitude and Latitude**

**CAROLINA GUTIERREZ**

Department: Interdisciplinary - Ecology

Aquatic insects' food web structure in streams is fairly well known for temperate zones, due mainly to advanced taxonomic knowledge of species. In the tropics, exact information about feeding traits of aquatic invertebrates is lacking, and existing studies are derived from North American classifications. This study will compare trophic guild analysis to the relative taxon composition and trophic network structure approaches in two latitudes (streams in Colorado and Ecuador) to elucidate how insects' trophic webs are built in the streams; which species are interacting inside each network, and how that changes as a function of altitude gradients within each latitude.

## **111 How to Eat Well in Fort Collins?**

**REYILA HADEER**

Department: English

The number of international students in the US is increasing sharply nowadays. International students are coming across different difficulties in terms of language, culture, daily life, relationship with others and so on. Among various difficulties, food is one of the major issues for international students. In this paper, I would like to design an ESP (English for specific purpose) course for Chinese students in Fort Collins in order to help them eat well and live more smoothly in such a foreign city.

## **112 Pilot Evaluation - SLiCE Officer Retreat**

**WHITLEY HADLEY**

Department: School of Education

The purpose of the SLiCE Officer Retreat is to bring together a diverse group of student leaders who are actively engaged in student organizations (RSOs) and interested in enhancing their leadership, community building, and networking skills. By participating in the retreat, we aim to develop students' leadership competencies including communication, goal-setting, group management, identity development, collaboration, and creativity. The purpose of the evaluation is based in a decision-oriented and program-oriented approach because the office is reviewing the value of the program, its benefits on the professional development of the coordinators, and the future developmental capacity of the program.

## **113 Irrigation Effects: Stress, Visual Quality, and Evapotranspiration of Ornamental Grasses**

**SAM HAGOPIAN**

Department: Horticulture and Landscape Archt

Finding new ways to efficiently use landscape irrigation is extremely important to large scale water savings. Information available about standard watering procedures of ornamental grasses is not research based. To improve our understanding, finding exact water use of specific ornamental species is extremely valuable for the water savings for homeowners and industry personnel. It is important to find precise irrigation needs of a few species of ornamental grasses, and test the limits that these plants can survive around those needs. This research can represent a large range of related ornamental grass species; serving as a platform for future studies.



## **114 The Portrayal of Older Adults in Illumination Films**

**JAIME HAINES**

Department: Psychology

Children enter kindergarten with established negative stereotypes about older adults, so scholars suggest that the content of media must be improved. This study examined how older adults are portrayed in Illumination Films' movies *Despicable Me* and *The Lorax*. It coded older adults' roles, sex, ethnicity, personalities, physical characteristics, and overall portrayal. Results were compared to previous studies of Disney films and showed consistencies (i.e. the primary role of characters being parent and grandparent), improvements (i.e. women being portrayed more positively), and lingering concerns (i.e. the large number of older adults still being portrayed negatively and the lack of ethnic diversity).

## **115 Hop Phytoestrogens to Prevent Gut Dysbiosis Due to Estrogen Loss**

**ALI HAMM**

Department: Food Science and Human Nutrition

The microbial composition of our gut has been associated with several diseases such as obesity and inflammatory bowel diseases. There is little research linking gut microflora with menopause. Using an ovariectomized mouse model, we will explore the following aims: Aim 1: Does ovariectomy change gut microbial community structure and increase intestinal inflammation? Aim 2: Does hop phytoestrogen consumption modulate intestinal inflammation and gut microbiome in ovariectomized animals? Aim 3: Determination of hop phytoestrogen metabolism in the ovariectomized model.

## **116 Surgically Enforcing Normalcy: A Critical Analysis of International Craniofacial NGOs**

**MARLEY HAMRICK**

Department: Ethnic Studies

The purpose of this study is to catalyze a critical understanding of the work of international craniofacial non-governmental organizations. The research questions follow: (1) What role does ideology play in international craniofacial NGO's representations of children with craniofacial differences in the Third World?, and (2) To what extent and in what ways do international craniofacial NGOs address the systemic barriers faced by children with craniofacial differences in the Third World, as portrayed by their social media? This study uses multimodal critical discourse analysis to examine the Facebook, Twitter, and YouTube profiles of four NGOs.

## **117 Singing Intervention for Vocal Skills in Persons with Parkinson's disease**

**SAMANTHA HANTZEPETROS**

Department: Music, Theatre, and Dance

The purpose of this pilot study was to determine feasibility and initial efficacy of an eight-week music therapy group protocol on the vocal quality of individuals with Parkinson's disease. Nine participants with PD and self-reported vocal difficulties were included in this con-

nience sample. Individuals participated in a singing group that was focused on vocal volume, articulation, and breath control. Music therapy techniques included Vocal Intonation Therapy, Oral Motor and Respiratory Exercises, and Therapeutic Singing. Results indicated that participants showed no decline in vocal abilities.

## **118 Investigation of Mechanisms of Mitotic Recombination in Yeast**

**VICTORIA HARCY**

Department: Interdisciplinary - Cell and Molecular Biology

In non-allelic homologous recombination, a non-reciprocal translocation is indistinguishable at the karyotype level whether it originated from a reciprocal conical homologous recombination (CHR) event or from a non-reciprocal break-induced replication (BIR) event. Recently published data showed that exposure to MMS damages long ssDNA tracts transiently formed during BIR, resulting in non-random, co-localized hypermutation, resembling mutation clusters found in cancer. In contrast, reciprocal CHR is not associated with extensive DNA synthesis, thus, should not lead to hypermutation. We plan to take advantage of this new finding to assign a mechanism of formation to the non-reciprocal translocations identified through genome stability assays.

## **119 Supporting Graduate Student Research, Writing, and Publishing at CSU**

**RENEE HARMON**

Department: School of Education

Our research seeks to learn the needs of Colorado State University graduate students in regards to their research, writing, and publishing. We will collect data from CSU graduate students through the use of surveys, interviews, and focus groups, and analyze the findings to assess if responses show the need for a Graduate Resource Center (GRC). Based upon preliminary findings, we envision a GRC that provides writing assistance across disciplines, specially addressing writing for academic journals, grants, theses, and dissertations.

## **120 Immune Regulation of PD-L1 Expression on Canine Tumors**

**GENEVIEVE HARTLEY**

Department: Interdisciplinary - Cell and Molecular Biology

The immune system regulates T cell responses by expressing checkpoint molecules such as programmed-death 1 ligand 1 (PD-L1). High expression of PD-L1 on tumor cells is associated with poor prognosis in cancer. Therefore, we screened 14 canine tumor cell lines for PD-L1 expression and tested their responsiveness to immune stimuli. We found that PD-L1 was expressed constitutively on all of the canine tumor cell lines, and PD-L1 expression was up-regulated by both IFN- $\gamma$  and a TLR3 ligand. We conclude that most canine tumors express PD-L1 and that both innate and adaptive immune stimuli can up-regulate PD-L1 expression.

## **121 The Effect of Economic Development on Disease Dynamics**

**BRODY HATCH**

Department: Economics

An econometric analysis of global disease burden trends over time. This study will analyze how economic development indicators (income per capita, education, health care, etc.) influence the disease burdens around the world. With this understanding, policy could target indicators with the highest marginal impact on the cost of disease burden.

## **122 Tailored Surface Modification of Three-Dimensional, Bioresorbable Materials for Biomedical Applications**

**MORGAN HAWKER**

Department: Chemistry

Porous, three-dimensional bioresorbable polymeric materials that mimic the extracellular matrix are candidates for biomedical applications including tissue engineering and wound healing. However, the surface properties of these materials are often undesirable for a specific application. Thus, the ability to fabricate 3D materials with ideal bulk properties and customizable surface properties is a critical aspect of biomaterial development. We demonstrate the fabrication of polymer scaffolds and subsequent modification using plasma processing. By employing a variety of scaffold materials and plasma precursors, we can tailor scaffolds' bulk and surface properties and elucidate differences in bio-reactivity by exploring cell-scaffold interactions.

## **123 The Sound of Voyeurism: The Phonetic Gaze of "Nigger/a"**

**GARRETT HAYES**

Department: Communication Studies

"Nigger/a" has entrenched itself within American pop-culture though it procured its establishment in American vernacular through oppressive systems. It is oppression materialized and simultaneously, the manifestation of community through the use of language. The term has such historical and oppressive implications that its inclusion in American pop-culture is both enigmatic and evident. The exigence for authors' employment of the epithet emanates from aspirations of accomplishing specific goals. I suggest that authors of media works employ the text "nigger/a" with the intentions to establish it (and/or its subjects) as an object of gaze for spectators.

## **124 Woman as Rebel: Lars von Trier's Nymphomaniac**

**JONI HAYWARD**

Department: English

Throughout his career, Danish filmmaker Lars Von Trier has gained a reputation for his misogynist depiction of women in his films—and *Nymphomaniac* Volume I & II is no exception. The examination of female characters in a medium as popular and widely consumed as film creates a dialogue about current trends in culture surrounding the treatment of women, and parallels well with a study of current feminist criticism. Looking specifically at Sara Ahmed's feminist theory in her book *The Promise of Happiness*, one gains insight into current issues in feminist thought and how women are depicted in film.

## **125 Augmenting Endothelium-Dependent Vasodilation Improves Blood Flow Control in Older Adults**

**CHRISTOPHER HEARON**

Department: Health and Exercise Science

Blood flow during exercise is regulated through a complex balance of both vasodilator and vasoconstrictor signals. In older individuals the ability to limit vasoconstriction during exercise is impaired and may be an important contributor to exercise intolerance. This study investigated whether increasing endothelium-dependent vasodilatory signaling would improve blood flow control during exercise in older adults. Doppler ultrasound was used to measure blood flow and assess vasoconstrictor responsiveness during exercise with and without infusion of the endothelium-dependent vasodilator acetylcholine. Our data suggest that augmenting endothelium-dependent vasodilation can improve blood flow control during exercise in older adults.

## **126 The Role of SCD1 in the Livers of Hibernating Mammals**

**ASH HEIM**

Department: Biology

Hibernating mammals such as the golden-mantled ground squirrel (*Callospermophilus lateralis*, GMGS) fast during winter, a period during which individuals enter a reduced metabolic state known as torpor. During torpor, GMGS rely primarily on stored lipids to fuel metabolic processes. Stearoyl-coenzyme A desaturase (SCD1) is an enzyme responsible for converting saturated to monounsaturated fatty acids, and manipulations of these structures lead to changes in tissue membrane fluidity, lipoprotein metabolism, and adiposity. SCD1 has recently emerged as an important regulator of metabolism; seasonal changes of SCD1 in GMGS liver may provide insight into the role this enzyme plays in prevalent metabolic disorders.

## **127 Evaluating City of Fort Collins' Open Streets: Findings and Implications**

**NICHOLAS HEIMANN**

Department: Colorado School of Public Health

FC Bikes implemented its inaugural Open Streets event in July 2014. The event was evaluated using various measures and methods to determine the attainment of event goals. The results of Open Streets evaluation allow FC Bikes staff to adapt the event implementation process to better meet certain goals and provide a blueprint for other communities wishing to introduce an event guided by goals of improving physical and social health of neighborhoods or broader communities. Open Streets evaluation has / will also lead the standardization of FC Bikes programs and ensure public funding is used to positively impact the community.

## **128 Kinetochore-Microtubule Attachments are Selective Cancer Therapy Targets**

**JAKE HERMAN**

Department: Biochemistry and Molecular Biology

Glioblastoma multiforme (GBM) is one of the most lethal and aggressive adult tumors, moreover current therapies for GBM are largely ineffective. To identify new therapeutic targets in treating GBM, we transformed healthy cells and observed that oncogenic RAS/MAPK sig-

naling compromises kinetochore-microtubule attachments. This oncogenic signaling aberrantly hyper-activates Aurora B kinase (ABK) and destabilizes kinetochore-microtubule attachments. This amplification of ABK activity creates at least three novel drug targets by increasing the dependence on recruitment of the ABK-counteracting phosphatase PP2A to kinetochores. These findings demonstrate that in a subset of cancers, kinetochore-microtubule attachments become weakened generating highly specific therapeutic targets.

## **129 Real Time, Automatic, Respiration Logging in Microplate Format**

**CAROLYN HOAGLAND**

Department: Soil and Crop Sciences

An increasing amount of microbial ecology work is now being performed in high throughput microplate formats, but current microplate lids prevent sampling the headspace of individual wells in real time. Agar-based colorimetric respiration lid systems are available for microplates, but the lid-securing mechanism obscures the plate, making it difficult to acquire data during the incubation period. In addition, the colorimetric response is non-linear; the sealed plate also limits the length of aerobic experiments and prevents reagent additions during its course. Therefore, I developed a real time, robotic, data logging respirometer for microplate formats.

## **130 Systematic Mapping Review Study: Equine Assisted Activities and Therapy (EAAT)**

**BETH HOESLY**

Department: Occupational Therapy

This study presents the methodological action undertaken for a systematic mapping review of equine assisted activities therapy (EAAT) published both internationally and nationally in scientific journals from 1980-present. Systematic mapping reviews are utilized when a body of scholarship has been going on for some time, yet still needs to be categorized, described, and/or evaluated. This methodological process yields a map of a certain discipline, in this case, EAAT. Furthermore, this map serves to highlight topics, research designs, theoretical frameworks, and themes.

## **131 Improving Background Rejection in the Future Neutrino Oscillation Parameter Measurements**

**MATT HOGAN**

Department: Physics

There are plans for a next generation U.S. long-baseline neutrino experiment consisting of a large liquid Argon neutrino detector 1300 km downstream of an intense, wide-band neutrino beam in order to measure the parameters of neutrino flavor oscillations which is a process where a neutrino of definite flavor (type) is created and later observed as a different flavor. A non-zero value for the parameter that violates charge-parity symmetry, a fundamental symmetry between processes involving matter and antimatter, might explain the observed matter/antimatter asymmetry in the Universe. A study in reducing background contamination in the oscillation analyzes is presented.

## **132 Economics of Mastitis Costs and Implementing Prevention through Diet Formulations**

**JACQUIE HOLLAND**

Department: Agricultural and Resource Econ

Mastitis is a common disease of the mammary gland in lactating dairy cattle, occurring in 23.4-42% of cows per year. Reduced milk production is the largest financial loss associated with mastitis, although the exact amount of loss is variable within the literature. The objective of this research is to determine the optimal feed costs of a diet including trace minerals (reducing mastitis costs) and to establish the cost of mastitis with emphasis on the value of reduced milk yield. The resultant costs of the disease and preventative diet allows producers to apply the research to more effectively manage the disease.

## **133 The Collapse of Independent Stations and Rise of iHeartRadio**

**ALISSA HOOPER**

Department: Communication Studies

Considering the changes in broadcast radio and the expanse into internet radio in recent decades, this essay seeks to explain the current state of the industry and propose where it may be headed in future years. Particular attention will be paid to radio giant iHeartRadio, of which I posit their growth as a conglomerate will only continue without FCC intervention, causing continued decline in the number of independent stations. Finally, I will explain how the state of the radio industry favors iHeartRadio, which is the only corporation with large stakes in the markets of both broadcast and digital radio.

## **134 Enhancing Research and Management of Culicoides-Borne Pathogens with Molecular Phylogenetics**

**MATT HOPKEN**

Department: Fish/Wildlife/Conservation Bio

Biting midges in the genus *Culicoides* (Diptera: Ceratopogonidae) are vectors of a diverse array of wildlife pathogens. Many of these pathogens are ubiquitous in North American wildlife with some listed by the World Organization for Animal Health as global threats to domestic and wild ungulates. Unfortunately, very little is known about the basic biology of the majority of *Culicoides* species. Disease risk assessments, prediction of epizootics, surveillance, and response to outbreaks thus suffer due to this paucity of data. We plan to alleviate this paucity by investigating the phylogenetic relationships of *Culicoides* using multiple DNA loci.

## **135 NUROA: A Numerical Roadmap Algorithm**

**REZA IRAJI**

Department: Computer Science

Complete, combinatorial motion planning approaches are theoretically well-rooted with completeness guarantees but they are hard to implement. Sampling-based and heuristic methods are easy to implement and quite simple to customize but they lack completeness guarantees.



Can the best of both worlds be ever achieved, particularly for mission critical applications such as robotic surgery, space explorations, and handling hazardous material? In this paper, we answer affirmatively to that question. We present a new methodology, NUROA, to numerically approximate the Canny's roadmap, which is a network of one-dimensional algebraic curves.

### **136 GraceFall: Development of a Fall Protective Coat for Elderly Women**

**LAUREN IVY**

Department: Design and Merchandising

The purpose of this study is to create a winter coat designed for elderly women utilizing inflatable airbag technology to help protect against injury while integrating aesthetic and fit needs. Implementing a combination of co-design and focus groups methods, a prototype was designed. Focus group feedback resulted in a positive response to the overall appearance of the garment. This suggests for future research taking into consideration functional and expressive preferences of the elderly currently overlooked in today's apparel industry. Results also suggest further research into inflatable technology capable of ensuring the privacy of the wearer.

### **137 Neuropsychological Factors Associated with Sexual Offending**

**HEATHER JACKSON**

Department: Psychology

Research exploring the relationship between social, biological, and environmental factors and individuals who commit sexually based offenses has been frequently examined throughout available literature. The bulk of the literature has focused on the interrelationship between these factors, and few have focused on the neuropsychological underpinnings associated with sexual offending. The current review systematically summarizes the literature focusing on the relationship between neuropsychological factors and sexual offending. It concludes that sexual offenders tend to show persistent abnormalities in neurological functioning compared to controls, and individuals who sexually offend against children were more likely to experience a greater number of neurological deficits.

### **138 Improving Bee Pollination in Urban Gardens to Increase Human Nutrition**

**RACHAEL JAFFE**

Department: Soil and Crop Sciences

The overall goal of this project is to understand the relationship between bee dispersal, human nutrition, and urban community gardens by quantifying pollinator diversity, floral resources, and nesting habitat. Pollination is an underrepresented factor in urban food security and although the contribution of bee pollinators to the human food supply has been quantified globally, the role of urban community gardens in nutrient acquisition to growing city populations is lesser known. This project proposes to quantify bee abundance and health within urban ecosystems, while educating in-need community members about best management practices to increase crop and nutrition quantity within city neighborhoods.

### **139 Resumption of Estrogen and Progestron in Postpartum Kalkouhi Ewes**

**SAM JALALI**

Department: Coll of Agricultural Sciences

Target of this experiment is to collect blood from Kalkouhi ewes located in Saveh Islamic Azad University for finding out the exact day of reproduction cycle begins in two groups of Primiparous and Multiparous ewes. For this matter first blood collection was on same the of parturition, second collection was one day after and from the second collection we collect blood every two days for 25 days postpartum.

### **140 Post-Transcriptional Mechanisms Coordinate Expression of Zinc Finger Protein mRNAs**

**AIMEE JALKANEN**

Department: Interdisciplinary - Cell and Molecular Biology

The C2H2 zinc finger proteins (ZNFs) are a family of transcription factors important for development, differentiation, and tumor suppression. Analysis of mRNA decay rates in human induced pluripotent stem (iPS) cells and genetically matched human foreskin fibroblasts (HFF) revealed that C2H2-ZNF mRNAs were significantly more stable in the iPS cells. Degradation of most mRNAs initiates with removal of the poly(A) tail, but multiple ZNF mRNAs have short poly(A) tails suggesting that these mRNAs are metabolized differently. We are characterizing the sequences and factors involved in regulating the short poly(A) tails and the subsequent effects on C2H2-ZNF mRNA expression.

### **141 Silencing Female Survivors of Sexual Violence in the U.S. Military**

**SARAH JAMES**

Department: Communication Studies

Increasing numbers of sexual assault reports against women in the U.S. military calls into question the current culture of masculinity, silence and complicity that the military fosters and perpetuates. As of 2013, Senator Kristen Gillibrand proposed reform legislation to change the reporting procedures of sexual assault crimes. In this project, I examine two texts: traditional public address of Gillibrand's legislation and a mediated characterization of this bill on the television series *House of Cards*. Using a critical rhetoric method, I will analyze each text for their efficacy in unmasking power structures and enacting social change.

### **142 Functionality and Accessibility of Backpacks for Mountain Rescue First Responders**

**DANIELA JANKOVSKA**

Department: Design and Merchandising

The purpose of the study is to explore common inhibiting issues such as, functionality and accessibility that mountain rescuers have with their backpacks. The researchers conducted 1-hour focus group sessions with 10 mountain rescuers using snowball sampling from the Rocky Mountain Region. A qualitative approach was applied where the focus group discussion data was transcribed verbatim and orga-

nized by common themes identified. Five major themes were identified (durability, flexibility, visibility, modularity and usability), which were analyzed using the FEA (functional, expressive & aesthetic) product attribute model. This is an exploratory study with global implications on the design of PPE gear.

### **143 The Framing of Post-Feminist Rhetoric**

**CAITLYN JARVIS**

Department: Communication Studies

My research seeks to understand how current media frames post-feminist values through parodying traditional feminist arguments as invalid and no longer necessary. Through highlighting the main tenants of post-feminism and viewing them the context of HBO's "Girls", my research introduces the idea of parodic framing in an effort to highlight the rampant reproduction of post-feminism in modern media.

### **144 Identifying Social Sustainability Indicators for Net Zero Energy Buildings**

**SWAETHA JEBACKUMAR**

Department: Construction Management

Net-zero energy buildings are a necessity to achieve the Energy 2030 goal set by the U.S. Federal Government. Although the technology advancement towards achieving net-zero energy buildings is reaching new heights, previous research indicate that social sustainability is not considered. The Social Sustainability concept in a construction project recognizes stakeholders' needs involved in and affected during the life cycle of the project. This exploratory study bridges the literature gap in identifying indices for social sustainability processes.

### **145 Comparative Statistics of High-Latitude and Equatorial Scintillation of GPS Signals**

**JOY JIAO**

Department: Electrical and Computer Engineering

During the past three years, we have studied a large amount of ionospheric scintillation data collected using GPS receivers established in Gakona (Alaska), Jicamarca (Peru), Singapore, and Ascension Island during the current solar maximum period. Through analysis of these data, we obtained a general understanding of the diurnal, seasonal, and geomagnetic activity dependence of ionospheric scintillation in high and low latitude. Scintillation event intensity and duration distributions are also revealed by these data.

### **146 Evaluation of Prion Vaccine Administered with Vaccine Enhancing Agent**

**VALERIE JOHNSON**

Department: Microbiology, Immunology and Pathology

Prion disease is characterized by pathologic accumulation of a misfolded form of a normal cellular protein in neurons. There is no treatment and vaccination strategies have been ineffective. We hypothesized that utilizing an effective antigen while simultaneously inhibiting monocyte migration could elicit a more effective anti-prion response. The vaccine was formulated using a peptide fragment of the human prion protein (PrP106-126). Mice received a mock injection, vaccine or vaccine with RS102895. Vaccinated mice had increased antibody titers and the group that received RS102895 also displayed a cell mediated immune response. This vaccination regime shows great promise in eliciting an immune response.

### **147 PHENOstruct: Prediction of Human Phenotype Ontology Terms using Heterogeneous Data**

**INDIKA KAHANDA**

Department: Computer Science

The human phenotype ontology (HPO) is a recently developed standardized vocabulary that describes the phenotype abnormalities encountered with human diseases. Only a small subset of human protein coding genes are annotated with HPO terms at the moment; but, many of the currently unannotated genes are believed to be related to disease phenotypes. We introduce PHENOstruct, the first computational method that directly predicts the set of HPO terms for a given gene and demonstrate that it outperforms several baseline methods. Furthermore, we highlight a collection of informative data sources suitable for gene-HPO association prediction, including large scale literature mining data.

### **148 Passport to Arts Policy, Teaching Civic Engagement in the Arts**

**CONNOR KEALEY**

Department: College of Liberal Arts

This project focuses on fourth and fifth grade public policy and advocacy curriculum in American public schools. Our research revealed that students were learning basic civics, but not a way to apply this knowledge to a particular topic, such as the arts. It also revealed that the important role of the individual citizen, as advocate in a representative democracy, is not fully addressed. Yet, effective citizenship requires an understanding of how the public policy process works and ways citizens can affect government action. Our curriculum directly addresses art and cultural policy and the role of the individual citizen.

### **149 Front Contact Design for CdTe Thin-Film Solar Cells**

**JASON KEPHART**

Department: Mechanical Engineering

The function of a solar cell is to convert light into electric current. The front contact of the solar cell must allow the maximum amount of light to the absorber while taking many electronic and materials considerations into account. For CdTe thin-film solar cells, the standard front contact consists of a tin oxide-based transparent conductor and resistive oxide, followed by a layer of CdS. (Mg,Zn)O and oxygenated CdS materials can be used to improve both electronic and optical properties. Relevant properties of these materials have been characterized and they have been integrated in working devices with improved efficiency.

### **150 Asymmetric Core Muscle Activity during Walking in Patients with MS**

**NATHAN KETELHUT**

Department: Health and Exercise Science

The purpose of this study was to investigate the core muscle characteristics (trunk flexors, extensors, lateral flexors) during walking in patients with Multiple Sclerosis (MS). [18F]-Fluorodeoxyglucose with Positron Emission Tomography showed that the less-affected side of patients with MS was activated more in the rectus abdominis, external oblique, internal oblique, and lateral flexor group ( $P < 0.05$ ). This acti-



vation pattern suggests a compensatory mechanism used by patients with MS in order to maintain balance and postural control during walking. Physical rehabilitative specialists should monitor core muscle activity to target walking impairments in these patients.

## **151 Offloading Smartphone Computing on Cloud to Save Battery Power**

**ADITYA KHUNE**

Department: Electrical and Computer Engineering

Smartphones have become the primary computing platform for masses. Longer battery lifetime is the most desired feature of smartphones today. Research shows that many applications are too computation intensive and if offloaded on the cloud then can actually save battery power. For such a system to work we need a mechanism which can decide when computing can be most beneficial if offloaded. In this research work I have presented an Offloading Decision engine which will consider the 'contextual information' of the user such as bandwidth, Data requirement of the application, CPU instance etc. to help the offloading decision process.

## **152 Brain Activity during Fatiguing Contractions Measured by [18F]-Fluorodeoxyglucose PET**

**JOHN KINDRED**

Department: Health and Exercise Science

Previous studies utilizing tasks requiring force or position control have found a briefer time-to-task failure for the position task. The purpose of this pilot study was to determine differences in brain activity between both fatigue tasks. Two participants performed both tasks, during which [18F]-Fluorodeoxyglucose (FDG), a positron emission tomography (PET) glucose analogue, was intravenously administered. After task completion participants underwent PET imaging. Greater FDG uptake, reflecting brain activity, occurred within visual-spatial processing brain regions during the position task. It is suggested that a briefer time-to-task failure observed during a position task may in part be due to increased visual feedback.

## **153 Establishment and Systematic Characterization of Mycobacterium Tuberculosis in Bioreactors.**

**PHILLIP KNABENBAUER**

Department: Microbiology, Immunology and Pathology

Mycobacterium tuberculosis infection is characterized by active and latent disease states. Granuloma-induced oxygen tension may shift bacteria into bacteriostatic persistence. Current models of hypoxia-induced mycobacteria have limitations, requiring establishment of novel culturing methods. Here, M. tuberculosis was propagated under defined oxygen concentration in bioreactors. Initial analyses confirmed mycobacterial non-replicating persistence. This study will provide insight into core physiological adaptations of M. tuberculosis while reducing bias from the contaminants during adaptation into dormancy. The findings from this study will greatly improve our understanding of M. tuberculosis bacilli in latency, and possibly contribute to breathalyzer based diagnosis of TB.

## **154 Internet Pluralism: The New Face of Environmental Activism**

**CASSIE KOERNER**

Department: Political Science

This study examines the changing means of participation in interest groups and how the Internet may be impacting who is joining and leading environmental and industry groups in the Colorado fracking discussion. The underlying theoretical frames are rooted in traditional political interest group and pluralist theory and draw from more recent literature on social networks and new media communications. These literatures contribute to the question of whether the Internet has "levelled the playing field" between elites and interest group participants by increasing access to information and removing financial and temporal barriers of interest group formation.

## **155 Marked Trematodiasis in a Population of Wild-Caught Trinidadian Guppies**

**JENNIFER KOPANKE**

Department: Microbiology, Immunology and Pathology

Wild-caught Trinidadian guppies (*Poecilia reticulata*) in a research laboratory were found to have an unusually high rate of morbidity and mortality following capture. Reported clinical signs included emaciation, erratic swimming, external sores, and death in greater than 50% of the guppies. Ten affected guppies from three river drainages were sacrificed for histological assessment. Findings suggested that infection with multiple infectious agents, especially visceral trematodes, was the most likely cause of morbidity and mortality in most fish. Investigators should be aware that wild-caught specimens used for experimental purposes may have multiple comorbid conditions that could compromise research outcomes.

## **156 Effects of Major Ions on Montane Stream Benthic Communities**

**CHRIS KOTALIK**

Department: Fish/Wildlife/Conservation Bio

Elevated concentrations of major ions are associated with a variety of anthropogenic disturbances in streams, including mountain top removal and valley fill operations (MTRVF), urban runoff, and road deicing. We conducted a series of stream microcosm experiments exposing montane stream benthic communities to several salt mixtures that bracketed the recently proposed USEPA benchmark of 300  $\mu\text{S}/\text{cm}$  for streams affected by MTRVF. In general, effects were observed at conductivity levels near the proposed benchmark. These results suggest that major ions are toxic to some aquatic insects, and effects on benthic communities in the field are likely when conductivity exceeds this benchmark.

## **157 Hereford Productivity**

**BETH KREHBIEL**

Department: Animal Sciences

The changes in productivity of Hereford cattle in different climates were compared based off of their region of origin throughout the United States and some parts of Canada. Hereford cattle of  $n=278$  were assigned to a region based on their breeder location (Cool Arid  $n=51$ ; Cool Humid  $n=44$ ; Transition Zone  $n=107$ ; Warm Arid  $n=52$ ; Warm

Humid n=24). The animals were genotyped for 66 single nucleotide polymorphisms (SNPs). The results obtained showed no significant differences in allele frequencies from the traits chosen, but further investigation is ongoing.

## **158 Development of Alternative Body Weight Measuring Method for Horses**

**KYUNGNYER KU**

Department: Clinical Sciences

A new method to accurately measure the body weight (BW) of horses based on their body volume was assessed. Body volume of 16 horses was measured from the 3D images obtained by using a portable 3D scanner. A linear regression model to estimate the BW of horses based on their body volume and gender was constructed. The coefficient of determination ( $R^2$ ) of the developed regression model was 0.94. This  $R^2$  was higher than other conventional methods such as weight tapes or visual estimation (conventional methods  $R^2 = 0.71-0.83$ ) when compared to the body weight measured using a large animal scale.

## **159 Structure and Dynamics of Supercooled Water Confined in Silica Nanopores**

**NIC KUON**

Department: Physics

In narrow hydrophilic pores, interactions with pore walls allow water to remain liquid well below the normal freezing point. We investigate the properties of nanoconfined supercooled water by means of molecular simulation. We study confinement in approximately cylindrical, 20-40Å diameter silica pores, a model for MCM-41 materials. We use Monte Carlo to determine water density in the pores in equilibrium with the bulk and molecular dynamics simulation to study the properties of confined water. We study the translational and rotational mobilities of molecules, and make contact with quasi-elastic neutron scattering experiments by analyzing self-intermediate scattering functions of water hydrogens.

## **160 Modeling the Anisotropic Biaxial Mechanics of Brain White Matter**

**KEVIN LABUS**

Department: Interdisciplinary - Bioengineering

The objective of this project is to improve computational models of traumatic brain injuries by characterizing the biaxial mechanics of brain white matter via experimentation and constitutive modeling. A biaxial test of brain tissue was developed, and quasi-static experiments were modeled using an anisotropic hyperelastic strain energy density function. Additional dynamic experiments will be performed to model the nonlinear viscoelasticity of white matter. Structural parameters measured by histology and electron microscopy will be incorporated into the constitutive model to increase the certainty of model predictions. This project will be the first to characterize the biaxial mechanics of brain tissue.

## **161 GMVH-2 Uprate Project**

**JOHN LADD**

Department: Mechanical Engineering

The goal of this project is to convert the Cooper Bessemer GMVTF-4 at Colorado State University, CSU, Engines and Energy Conversion Laboratory, EECL, to a GMVH-2. The purpose for this conversion is to develop techniques to increase the operating efficiency of the aging in-

tegral compressor on U.S. pipelines. Improving, rather than replacing, the existing infrastructure can save companies upwards of \$6 million per compressor engine. To complete the conversion a combination of solid modelling and collected data will determine if the engine will be capable of handling the increased operational pressures associated with the conversion. The engine will then be instrumented with thermocouples, strain gauges and accelerometers to collect on engine data to validate the solid modelling to ensure the engine remains within the safe operational limits as the engine is uprated to the GMVH.

## **162 Reconstructing Social Futures**

**EMILY LAPADURA**

Department: English

Current first-year composition (FYC) research proves many students write daily on digital platforms like social networking sites (SNS). As we move from a page to screen society, most SNS writing is visually oriented as students produce and consume digital photography. My study seeks to discover how designing and teaching an FYC class exploring SNS use develops students' critical digital literacies. I applied a critical approach to CSU's FYC course by introducing students to ideology, and how social norms produced by systems of power can effect on their rhetorical choices when posting personal photos on popular SNS like Facebook and Instagram.

## **163 Is Feline Foamy Virus Associated with Disease in Cats?**

**CARMEN LEDESMA FELICIANO**

Department: Microbiology, Immunology and Pathology

Feline foamy virus (FFV) is a Retrovirus that has been regarded as apathogenic despite life-long infection in cats. Because of this, FFV carries potential applications in vaccine and gene therapy development, as well as a potential model for foamy virus/immunodeficiency virus research. To verify apathogenicity we inoculated cats with FFV or a potential vaccine vector candidate. Viremia was persistent and detected as early as 21 days post-infection. No cats developed clinical disease and sample analyses showed no statistically significant difference between positive and negative cats. Based on these preliminary results, FFV can be assumed to be apathogenic in cats.

## **164 Cationic Liposomes-Oligonucleotide Complexes: An Alternative Adjuvant for Polyclonal Antibody Production**

**ERIN LEE**

Department: Microbiology, Immunology and Pathology

Rabbits are routinely used for polyclonal antibody production and the most common adjuvants used are Freund's and TiterMax. While Freund's adjuvants induce robust antibody responses there are some animal welfare concerns related to the granulomas complete Freund's adjuvant causes. TiterMax is an alternative adjuvant to induce antibody response without animal welfare concerns, but the antibody response may not be as robust as Freund's adjuvant. Cationic liposome-oligonucleotide complexes (CLDC) are potent activators of the immune response without reported animal welfare concerns. This study assessed the antibody response to CLDC compared to Freund's adjuvant and TiterMax.

## **165 Efficient Reinforcement Learning with Relevance Vector Machine**

**MINWOO LEE**

Department: Computer Science

With given rewards, reinforcement learning agent searches for an optimal policy. For this, it is required to estimate the value of an action in a state. We propose a novel approach that uses relevance vector machine (RVM) for this function approximation. By using RVM, we can collect additional information to understand the problem better and consequently find an optimal policy. Furthermore, we can learn features adaptively, achieve new knowledge representation, and develop fast and efficient transfer learning strategies. Future research activity will follow in three major directions: convergent learning, continuous domain search, and transfer learning.

## **166 On-Site Sampling System for Perchlorate in Groundwater using Portable Analysis**

**BRYN SON LEHMKUHL**

Department: Chemistry

Perchlorate is a major drinking water contaminant that can lead to thyroid problems and developmental issues in children. Current perchlorate monitoring methods are expensive. Microchip electrophoresis (MCE) offers an alternative method which is easily brought into the field and inexpensive to build and maintain. High concentrations of sulfate and chloride found in groundwater can negatively affect MCE due to their high conductivities. We are employing Ba-Ag resin-filled filter cartridges to reduce or eliminate the interference of these species in perchlorate analysis. Simulated groundwater samples were filtered, resulting in marked decreases for chloride and sulfate, improving MCE compatibility.

## **167 Engineering Cocultures of Primary Human Hepatocytes and Kupffer Macrophages**

**CHRISTINE LIN**

Department: Interdisciplinary - Bioengineering

To characterize drugs, the pharmaceutical industry currently utilizes liver models that rapidly decline in functionality and lack Kupffer macrophages (KM), a cell type known to modulate hepatocyte responses to drugs. We engineered a culture platform using microfabrication techniques that can keep both cryopreserved primary human hepatocytes (PHHs) and KMs functional for several weeks, allowing modeling of chronic drug treatment and inflammatory stimuli effects. The coculture model displayed high functionality and was able to modulate toxicity caused by a prototypical drug, trovafloxacin. This model can be utilized for evaluation of the effects of interactions between these cell types on drug disposition.

## **168 Developmental Changes in Response Monitoring Ability in 7-to 25-year-Olds**

**MEI-HENG LIN**

Department: Occupational Therapy

Error-Related Negativity (ERN) is a brainwave component which indicates a cognitive functioning – response monitoring. Response monitoring is an ability to monitor one's ongoing behaviors and detect errors during task performance. While several researchers pointed out that

trial-to-trial variability might lead to a reduced ERN amplitude in children compared to adults, few researchers have adjusted the trial-to-trial variability when studying the developmental trend of response monitoring. This project demonstrated that by adjusting trial-to-trial variability using the Woody filter technique, researchers are able to remove measurement error and provide a more accurate interpretation of the ERN amplitude changes across development.

## **169 Bounds for Approximate Dynamic Programming Based on String Optimization**

**YAJING LIU**

Department: Electrical and Computer Engineering

In this paper, we will develop a systematic approach to deriving guaranteed bounds for approximate dynamic programming (ADP) schemes in optimal control problems. Our approach is inspired by our recent results on bounding the performance of greedy strategies in optimization of string functions over a finite horizon. The approach is to derive a string-optimization problem, for which the optimal strategy is the optimal control solution and the greedy strategy is the ADP solution. We show that any ADP solution achieves a performance that is at least a factor of the performance of the optimal control solution, characterized by Bellman's principle.

## **170 Modeling Crash Rates for a Mountainous Highway**

**XIAOXIANG MA**

Department: Civil and Environmental Engineering

Traditional traffic safety analyses usually focus on highly aggregated data. The aggregated data ignores the time-varying nature of some critical factors and their effects on traffic safety may be masked. An advanced random parameter tobit model with panel data in refined temporal scale is developed. This is so far the first reported effort on integrating random parameter tobit model and refined-scale panel data to develop crash rate models. Results show that random parameter tobit model outperforms fixed parameter tobit model and the factors related to traffic and weather/surface conditions are found to play significant roles in accident rate model.

## **171 Spatial Inequality in Groundwater Access in the San Luis Valley**

**KELSEA MACILROY**

Department: Sociology

This case study explores the development of spatial inequality to groundwater access in the northern part of the San Luis Valley in south-central Colorado. Based on qualitative interviews and participant observation, this study pays careful attention to historical sequence, timing, and the long-term influence of specific policy. Identification of three main mechanisms reveals how--at critical junctures--paths were created that paved the way for long-term consequences to access and issues in sustainable groundwater use.



## 172 Agenda Setting and the Twitter Effect

JUNE MACON

Department: Journalism and Technical Communication

My focus is a qualitative and quantitative research effort on the use of Twitter and how people discussed a specific situation in the city of Ferguson when a Ferguson police officer shot and subsequently killed an unarmed male. Understanding the diffusion dynamics of bad news in social media is important for crisis communication.

## 173 Investigation of Copper(II) Dipeptide Complexes: Interactions and Complexation Geometry

ESTELA MAGALLANES

Department: Chemistry

Alzheimer's, Parkinson's, Huntington's and prion diseases all involve the formation of amyloid beta protein plaques formed from small peptides. Not much is known about plaque formation. The purpose of this study is to characterize the complexation behavior of peptides and we began with dipeptides (glycylglycine and glycyltyrosine) in the presence of the copper(II) ions. This was done through <sup>1</sup>H and <sup>13</sup>C NMR. Future studies need to be done including the characterizing of complexation behavior of the amyloid peptide and characterization of the effects of peroxides on peptide complexation.

## 174 Immigration Policies and Human Consequences in Ana Castillo's The Guardians

ANGELINA MAIO

Department: English

Ana Castillo's *The Guardians* centers on a family who is occupying the space on the U.S.-Mexico border and having to occupy that space within given rules and regulations that protect the border. This project focuses on Gabo, a sixteen year old who crossed the U.S.-Mexico border illegally. I argue that the character of Gabo serves as a critique and analysis of borders, spaces and policies.

## 175 Friends Don't Fat Talk: Memorable Messages in the Body Project

SHANA MAKOS

Department: Communication Studies

The purpose of this study is to investigate the most memorable messages in the body-positivity workshop, The Body Project. A "memorable message" is a meaningful unit of communication that affects behavior and guides the sense-making processes. Presented here is a preliminary typology of which messages were most memorable. Themes include the ability to reject negative self-talk, critique the thin ideal, and The Body Project as a community building and consciousness-raising space. Discussion and suggestions for future areas of research are also presented.

## 176 <sup>64</sup>Cu-ATSM PET/CT Imaging and Immunohistochemistry in Dogs with Spontaneous Osteosarcoma

KELLY MANN

Department: Environmental and Radiological Health

Copper-64-diacetyl-bis (N4-methylthiosemicarbazone), or <sup>64</sup>Cu-ATSM, is a positron-emitting radiotracer that serves as a marker of hypoxic metabolism. Based on studies in experimental tumor models, hypoxic tumor regions also harbor tumor stem cells. <sup>64</sup>Cu-ATSM tumor uptake may be a direct predictor of treatment response and also has potential as an internal radiotherapy agent. We have initiated <sup>64</sup>Cu-ATSM PET/CT and immunohistochemistry studies in pet dogs with naturally-occurring osteosarcomas as a large animal translational model to evaluate relative tumor uptake, biodistribution for internal dosimetry modeling, and co-localization of <sup>64</sup>Cu-ATSM in regions of tumor hypoxia and tumor stem cells.

## 177 Plasma Modification of Polymeric Materials for Environmental and Medical Applications

MICHELLE MANN

Department: Chemistry

Porous, three-dimensional polymeric materials used for biomedical and water filtration applications suffer from bacterial attachment and protein adsorption resulting in fouling. Plasma processing can limit this biofouling because it allows tailoring of the surface properties of the materials while retaining the bulk properties. In this work, we describe the surface modification of 3D polysulfone microfiltration membranes and polycaprolactone scaffolds using H<sub>2</sub>O (g) plasma treatment to create hydrophilic and low fouling materials. Through surface analysis techniques we determine how plasma processing induces changes in the surface functionality of these materials and how these properties affect bacterial and cell attachment.

## 178 Developing an Atomistic Understanding of the Structure of Bone Mineral

MARY MARISA

Department: Chemistry

The mineral in bone, generally considered calcium hydroxyapatite [Ca<sub>10</sub>(PO<sub>4</sub>)<sub>6</sub>(OH)<sub>2</sub>], is a disordered material. Extensive experimental work has shown bone mineral to contain various chemical substitutions (e.g. Mg<sup>2+</sup>, CO<sub>3</sub><sup>2-</sup>) and vacancies within the mineral, however, the nature of these defects is not well understood. Using advanced synchrotron X-ray scattering techniques, our research is aimed at understanding the atomic structure of this mineral. Using this approach, the effect of synthetic conditions was evaluated in order to build an atomistic picture of the structure. Our results show that the rate of formation impacts the disorder of the mineral when more ions are present.



## **179 Does Ineffective Transmission or Failed Persistence Explain Recent Plague Range-Expansion?**

**DAVID MARKMAN**

Department: Biologyogy

Complex interactions among pathogens, reservoir hosts, and vector species may promote or limit pathogen range expansion and cross-species spillover events (when a pathogen causes an epidemic in a novel host population). I will apply a multi-scale (molecular-to-landscape) approach to examine the role of a generalist flea species, *Pulex simulans*, in transmission, persistence, and observed range expansion of the plague-causing bacterium, *Yersinia pestis*. Analyzing bio-geographic, climatic, and physiological factors that influence transmission capacity and distribution of the plague vector *P. simulans* will elucidate factors that precipitated recent expansion events and enable implementation of superior pathogen control measures worldwide.

## **180 Towards Unsupervised Attribute Discovery**

**TIM MARRINAN**

Department: Mathematics

Data sets can be characterized by many kinds of attributes. For instance, images of animals might be labelled by species, color, eating habits, and size. Identifying attributes of the data is often accomplished manually by domain experts or by heavily supervised machine learning algorithms. Alternatively, when the data at hand consists of linear subspaces, we present a method called the Random Flag Consensus algorithm that utilizes geometric structure to identify meaningful attributes that explain portions of the data. We provide theoretical motivation for the algorithm, and present initial results of unsupervised attribute discovery for real world image data.

## **181 Achieving Kinetic Control of Solid State Chemical Reactions**

**ANDY MARTINOLICH**

Department: Chemistry

Solid state chemistry is often dictated by thermodynamics, requiring high temperatures and long reaction times to overcome the limits of diffusion through the solid reactants. To circumvent this, we pair the formation of our desired product (the superconductor CuSe<sub>2</sub>) with the formation of an energetically favorable byproduct, NaCl. By studying the structural transformations as the reactants occur, we find that a variant of CuSe<sub>2</sub> that normally only forms at high temperatures and pressures, can be formed through this reaction scheme at 100 C, which can be rationalized as a kinetic structural rearrangement from the precursors rather than a thermodynamic outcome.

## **182 Gender and Advertising**

**TAMMY MATTHEWS**

Department: Journalism and Technical Communication

This literature review evaluates the construction and effects of sex typing and gender typing in advertising. Advertisers use gender stereotypes to enhance brand awareness and boost sales. However, research shows that the consequences are not necessarily positive. This paper

focuses on the evolution of the research on gender and advertising as well as how stereotypes in advertising have or have not changed over time. Future research could address presenting the reality of the gender spectrum in advertising rather than the traditional female-male gender dichotomy. The research is discussed with reference to Bem's (1981) gender schema theory and queer research.

## **183 Heterodyne-Detected Sum Frequency Generation Spectroscopy**

**MAX MATTSON**

Department: Chemistry

Heterodyne-detected sum frequency generation spectroscopy is being developed to study chemical processes exclusively at interfaces. Chemical processes at interfaces are substantially different from chemical processes in bulk solutions and interfacial chemistry is very important in many areas including solar cell efficiency, surface wettability, electrochemistry, and cell membrane biology. The signal field in sum frequency generation spectroscopy is inherently weak and thus can be difficult to detect. Heterodyne detection is used to increase the signal to noise of the sum frequency as well as allow phase sensitive detection which gives unambiguous information about the molecules at the interface.

## **184 Organizational Change for Corporate Sustainability among Colorado Ski Resorts**

**PAVLINA MCGRADY**

Department: Human Dimensions of Nat Res

As the world faces an increasing array of environmental, social and economic challenges, businesses must lead the way towards a transformative paradigm shift. This project utilizes Diffusion of Innovation theory to explore how Colorado ski resorts are changing towards sustainability, what factors affects the companies' decisions to adopt or not sustainability-related policies and practices and what institutional mechanisms facilitate (or impede) the change process. As work-in-progress, findings based on qualitative data reveal that the complexity of the sustainability idea is a main barrier while a devoted leader is identified as the key facilitator of change towards sustainability.

## **185 Experimental Infection of Deer Mice with Maporal Hantavirus**

**AMANDA MCGUIRE**

Department: Micrbiolgy, Immunolgy and Pathology

New World hantaviruses that are pathogenic to humans require animal biosafety level 4 (ABSL-4) containment. We have determined that an ABSL-3 hantavirus, Maporal virus, persistently infects deer mice, the principal reservoir host of Sin Nombre virus. We have also generated primary pulmonary cells using endothelial cell growth factors that support replication of MAPV. Together, this model will permit expanded characterization of an important reservoir host species and facilitate studies of how hantaviruses may manipulate the antiviral response of reservoir host cells.

## **186 An Analysis of Sustainability Discourse in U.S. Cities**

**MORGANN MEANS**

Department: Political Science

Sustainability represents a highly contested concept that, although widely articulated as a solution for concomitantly solving environmental, social, and economic concerns, lacks a consistent definition and clear standards for practice. Given this ambiguity, this project performs a content analysis on the official websites of 200 U.S. cities in order to understand the various definitions of sustainability at play among municipal actors. In addition, regression analysis is used to highlight potential factors, such as demographic variables and the presence of environmental focusing events that might impact cities' tendencies to articulate certain conceptualizations of sustainability when discussing their policy priorities.

## **187 Active Complex Electrode (ACE1) Electrical Impedance Tomograph**

**MICHELLE MELLENTHIN**

Department: Interdisciplinary - Bioengineering

Electrical Impedance Tomography (EIT) is a low-cost, portable and radiation-free imaging modality that can be used to create low spatial resolution images based on varying electrical properties of biological tissues. An important application of EIT is pulmonary imaging. In certain clinical applications, such as distinguishing between pleural effusion and atelectasis, measurement of voltage phase is required. Reconstruction is achieved via the non-iterative and nonlinear D-bar algorithm. The design and testing of a pairwise current injection EIT system for phasic voltage measurement is presented. Calculated signal-to-noise ratios for measured data and reconstructed images from the system illustrate its successful construction.

## **188 Latino Grandparents Raising Grandchildren Literature through a Bioecological Lens**

**NANCY MENDOZA**

Department: Human Devlpmt and Family Studies

This paper provides a summary of the published research addressing the challenges and strengths of Latino grandparents raising grandchildren (GRG) in the United States. Using the bioecological framework the literature addressing Latino GRG was examined. This framework provides a lens for understanding and situating research on Latino GRG that resulted in discovering grandparenting strengths and challenges. These areas of focus include: reasons for caregiving, health status, language barriers, financial challenges, intergenerational relationships, religion, cultural characteristics, and acculturation. We conclude with a discussion addressing future research and a call to action for more research on Latino GRG.

## **189 Promoting Psychosocial Health and Empowerment among Sex Workers in Nepal**

**LAUREN MENDER**

Department: Psychology

Female commercial sex workers (FCSWs) in Nepal are vulnerable to an array of occupational hazards and have been found to have poor psychosocial health and a low sense of personal agency. In collaboration with a non-governmental organization (NGO), a brief peer education intervention was piloted to promote psychosocial health and empowerment among FCSWs in Kathmandu. Exit interviews were conducted with nine of the ten peer educators and two NGO field staff to collect in-depth feedback regarding the training and peer educator teaching experiences. This presentation will provide an overview of the program and a snapshot of the exit interview findings.

## **190 Practical Search over Encrypted Data**

**TARIK MOATAZ**

Department: Computer Science

As a major ongoing cloud trend, data outsourcing has attracted many end users by its appealing reduced costs, elasticity and availability. For security and privacy, encryption has to be performed on users' data before the externalization in order to prevent any confidentiality breach. However, maintaining outsourced data confidentiality while preserving cloud search services is challenging. While Cloud search services lie on the ability to operate on plaintext data, any encryption will annihilate the entire search efficiency. In this paper, we thoroughly depict the field of searching over encrypted data and detail some cryptographic primitives that solve this problem.

## **191 Embodiment in Absence: Representation of Loss in the White Spaces**

**KAREN MONTGOMERY MOORE**

Department: English

Carole Maso's *The Art Lover* and HR Hegnauer's *Sir* strategically use white space in order to represent the textually unmarked body of their subject. Such formatting is a deliberate choice which allows space to consider the physical body- whether a character or memory of a someone known to the author- on the part of both the reader as well as the author. This space for consideration becomes temporal as well, by creating a pause in the writing, and also works as a prompt: if this space is so empty, what (or who) should be here to fill it?

## **192 Apple iPad vs. Microsoft Surface: Examining Tablet Marketing Strategies**

**ASHLEY MOORE**

Department: Journalism and Technical Communication

Apple revolutionized the tablet market with the iPad. Since then, competitors have been racing to create similar products, such as the Surface by Microsoft. Although both companies compete within the same market, content analyses of Microsoft Surface and Apple iPad commercials revealed each's different marketing strategies. As the industry leader, iPad commercials act as emotional appeals, denoting the iPad itself as a universal, cultural symbol. As the competitor, Surface commercials

contain both emotional and rational appeals emphasizing specific functionalities not currently met by the iPad. This information could be useful towards future successful marketing strategies for the tablet industry.

### **193 Interactions between Diet and Secondhand Smoke Exposure on Metabolic Syndrome**

**BRIANNA MOORE**

Department: Environmental and Radiological Health

Metabolic syndrome is likely caused by a complex interaction between exposure to secondhand smoke (SHS) and diet, but few studies have evaluated this relationship. We examined the interaction of exposure to SHS and diet on metabolic syndrome among 12-19 year olds by introducing interaction terms (with SHS) of nutrients into logistic regression models. Increases in metabolic syndrome risk among children with both high exposure to SHS and low levels of nutrients (vitamin E, omega-3 fatty acids) are greater than expected due to the individual effects alone. Antioxidant-rich and omega-3 fatty acids-rich diets may reduce the risk for SHS-induced metabolic syndrome.

### **194 Exploring the Lived Experience of Caregiving**

**ALLY MORAVEC**

Department: Occupational Therapy

Almost 1 out of every 3 adults provides care to an ill or disabled family member; yet, little is known about the lived experience of caregiving (American Psychological Association, 2014). The purpose of this ongoing occupational therapy qualitative study is to explore the daily activities and experiences of six individuals participating in a spousal caregiver support group. Participants completed a time use diary, interview, and focus group discussion. Data will be analyzed using a constant comparative analysis. This poster will present main themes and potential implications to address the ongoing needs of the growing population of caregivers.

### **195 Man vs. Science: The Case of Dietary Supplements**

**JESSICA MORRIS**

Department: Journalism and Technical Communication

Dietary supplements are an unusual case for marketers because there is not much scientific evidence bearing their effectiveness, allowing marketers to make claims about effectiveness not grounded in science. Additionally, these products are sold online where there are many user comments that relay specific individuals' positive or negative experience with the product. This study aims to determine how comments and scientific evidence affect the consumers' opinion and willingness to buy the product. The methods involve a factorial design that analyzes scientific evidence and anecdotes to determine which factor has the highest impact on consumers' willingness to buy the product.

### **196 Frida Kahlo's Style through Parties and Food**

**DULCINEA MUNOZ GOMEZ**

Department: Foreign Languages and Literature

This research is about Frida Kahlo, Mexican artist, and her relationship between her artwork and her style life seen through her paintings. How her feelings are expressed in her work and how the food and the most important Mexican holidays are represented in that work and what those foods mean.

### **197 Effect of Varying Process Parameters on CdTe/CdS Microstructure and Performance**

**AMIT MUNSHI**

Department: Mechanical Engineering

CdTe thin film photovoltaics (solar cells) have shown that they have the potential to replace conventional energy sources with an electricity source that is green, abundant and economical. They are commercially viable as has been demonstrated by various utility scale installations at several locations in USA. The performance of CdTe photovoltaic devices are sensitive to process parameters. Efforts are made in this study to provide new insight into the understanding of relationship between fabrication process, device performance and thin film microstructure. The effects on film microstructure are studied using advanced microstructural characterization methods while relating them to electrical performance.

### **198 Investigating Effects of Paraquat on Protein Synthesis in C2C12 Myoblasts.**

**ROB MUSCI**

Department: Health and Exercise Science

Reactive oxygen species (ROS) may modify the balance between protein synthesis and breakdown. We predicted that acute exposure to ROS produced during paraquat (PQ) treatment would increase whereas prolonged exposure would decrease protein synthesis in C2C12 myoblasts. Using 4% deuterium oxide enriched media, we measured protein synthesis in mitochondrial and cytosolic compartments. Exposure to 2mM PQ for 4h augmented mitochondrial protein fractional synthesis rate (FSR), whereas cytosolic FSR was blunted at 8 and 12h. Future investigations should examine protein breakdown in response to PQ.

### **199 An Investigation of the Purpose and Relevance of One-off Events**

**GARRETT MYNATT**

Department: College of Liberal Arts

Creating festivals that re-occur increases logistical problems because there is a need to plan for the future and establish a presence that will evolve. Festivals are "an organized series of acts and performances usually in a relatively small area" (Juha Iso-Aho, 2008). There is no need to have a festival re-occur; there is more opportunity to explore the community that surrounds them in their true nature when they are singular. Focusing on identity, community, ritual festivals and future festivals will support my thesis.

## **200 Plasma Modification of Nitric Oxide Releasing Polymers for Tailoring Applications**

**BELLA NEUFELD**

Department: Chemistry

To improve medical device failure, scientists incorporate naturally therapeutic molecules into polymeric materials to guide a physiological response and enhance the surface-biological interaction. As a model system, nitrosated glutathione (GSNO) was blended into a tygon polymer to make thin films. GSNO acts as a nitric oxide (NO) donor, which has antibacterial and cellular proliferation capabilities, while tygon is a polymer currently used in medical devices. One challenge with using tygon, however, is its undesirable surface properties. The use of plasma modifications enables the materials to maintain bulk properties, while tuning surface properties. In this work, GSNO-tygon films underwent water plasma-treatment.

## **201 Generation of Nitric Oxide through Bound CuBTC towards Medical Applications**

**MEGAN NEUFELD**

Department: Chemistry

In summary we present the first report of in situ growth of a MOF onto a preformed natural polymeric substrate. While in this approach, CuBTC provided the MOF component of the system, the developed protocol can be applied to the vast library of known MOFs for exploitation in numerous applications, by incorporating the proper functionalization of a polymeric material. Thus, allowing the advancement of MOF polymeric composites in a wide range of applications. Here we have presented a demonstration of applicability through sustained reactivity of the swatch towards NO generation for potential utilization in medical devices.

## **202 Sexual Orientation is Associated with Temporal Differences in Neural Processing**

**MAIA NGUYEN**

Department: Psychology

Social biases have been demonstrated based on race, age, and sexual orientation. Behavioral research addressing sexual orientation identification has shown that individuals perform better than chance at recognizing the sexual orientation of others. Time processing for sexual orientation congruent and incongruent stimuli, based on participant self-report, was examined. Participants completed questionnaires regarding their sexual orientation and then reported their best judgment on the sexual orientation for images of self-identified homosexual and heterosexual individuals. There was greater P100 activity for male compared to female stimuli in heterosexual participants only. Homosexual participants had differences at P100 based on sexual orientation of stimuli.

## **203 Proteomic Profile of Mycobacterium Tuberculosis Strains after Isoniazid Resistance**

**LUISA NIETO RAMIREZ**

Department: Microbiology, Immunology and Pathology

Tuberculosis continues being an important health threat worldwide, partially because the emergence of resistant *Mycobacterium tuberculosis* (Mtb) strains. United States recently reported a scarcity of isoniazid (INH) that could increase INH resistant rates. The characterization of the Mtb proteome before and after acquiring INH resistance, remains understudied. We determined variations in the protein abundance between two isogenic strains of Mtb from a pulmonary tuberculosis patient with different INH susceptibility profiles. Our proteomic mass spectrometry analysis identified 97 Mtb proteins with altered abundance after INH resistance. These proteins are involved in ATP synthesis, lipid metabolism, ribosomal assembly, virulence, detoxification and adaptation.

## **204 The Pre-Retail Beef Resistome Accessed Using Shotgun Metagenomics**

**NOELLE NOYES**

Department: Clinical Sciences

Beef is a potential source of antimicrobial resistant (AMR) infections in humans. The goal of this study was to characterize the pre-retail beef resistome using shotgun metagenomics. Pens of cattle were tracked and sampled at critical points in the feedlot and slaughter systems. Total DNA was sequenced and 318 AMR determinants (ARDs) were identified. No ARDs were found in post-slaughter samples. Abundance of ARDs did not differ significantly between sampling points, but diversity of ARDs did. Results suggest that AMR is not readily transmitted via beef, and overall findings emphasize the potential of metagenomics in food safety research.

## **205 'One Health' Approach to Review Novel Bean-Based Dog Food**

**ERIN NUCKOLS**

Department: Colorado School of Public Health

The human-animal bond has been associated with positive influences on human emotional well-being but less is known about the role of the human-animal bond in overall health. The purpose of this study is to understand owner perceptions and behaviors regarding healthy weight, diet, and physical activity in their dogs. Preliminary results from this work demonstrate a knowledge-gap about obesity. Owner perceptions about their overweight/obese dogs may relate to the human-obesity epidemic. Companion dogs may be an incredible motivation to help improve human health, making this study extremely relevant to future directions in One Health.

## **206 Collection, Transcription, and Categorization of Mexican Singing Games**

**GABY OCADIZ VELAZQUEZ**

Department: Music, Theatre, and Dance

Naranja Dulce, Limón Partido is a cancionero, a lyric book without music which was published during the end of the twentieth century. It included a recording with singing games, lullabies, finger-plays, and rhymes in addition to some historical facts. It is one of the main re-



sources of Mexican folk music. Without these recordings many of the songs would be lost. This research project will collect, transcribe to music notation, and categorize the songs to help in the development of programs of music education based on folksong literature and to enhance the access of Mexican folk literature for music teachers.

## 207 Nutrition Claim Impacts on Urban Nepalis' Food Choice

ANDREW OGLE

Department: Psychology

Halo effect biases may lead consumers to unduly attribute overall healthfulness to unhealthy food products bearing front-of-pack nutrition claims (FOP NCs). Therefore, FOP NCs might influence food choices and ultimately diet-related chronic illness. We gave a Nepali-language experimental survey to 239 grocery shoppers in Kathmandu, Nepal. They provided their purchase intentions and perceptions of healthfulness, taste, naturalness, quality, and attractiveness for images of familiar food products that were counterbalanced to feature FOP NCs or not. Analyses of product ratings reveal that FOP NCs do impact consumer perceptions, but their impacts differ across products. Implications for food packaging regulations are discussed.

## 208 Assaying Grasses from Rocky Mountain National Park for PrPCWD

AIMEE ORTEGA

Department: Microbiology, Immunology and Pathology

The exact mechanisms behind transmission and spread of Chronic Wasting Disease (CWD), which affects cervids, are unknown but research has shown that CWD can spread through direct animal contact or via indirect exposure to contaminated feed and water sources. Here, we further explore the latter and determine whether CWD can be detected in grasses and other plants in Rocky Mountain National Park (ROMO) by use of the protein misfolding cyclic amplification (PMCA) assay. This summer three sites within ROMO were surveyed and a total of 32 plants were collected. Plant samples were decontaminated and then assayed for detection of CWD.

## 209 The Influence of Employment Competition on Age Prejudice

JAVIER OSPINA

Department: Psychology

This study investigated how intergenerational competition over employment may influence endorsement of ageist beliefs. Survey data was collected from Amazon's Mechanical Turk (N=395) measuring employment status, unemployment duration, peer unemployment, underemployment, job insecurity, and ageism. Work centrality was investigated as a moderator of these relationships. Perceived threat of older persons as a possible mediator. Results indicated that underemployment and job insecurity were significantly associated with ageism, that work centrality moderated peer unemployment-ageism relationships, and that threat was associated with underemployment, job insecurity, and ageism. Future work should utilize a longitudinal design to establish causality and support the proposed mediation model.

## 210 Parameter Estimation from Sparse and Compressed Measurements

POORIA PAKROOH

Department: Electrical and Computer Engineering

In this work, the problem of parameter estimation from compressed and sparse noisy measurements is studied. First, the effect of compressed sensing with random matrices on Fisher information, the Cramer Rao bound, and the probability of a subspace swap are studied. In the second part, we look at the problem of parameter estimation for p damped complex exponentials, from the observation of sparse and coprime samples of their weighted and damped sum. We present 2p parameterization of the orthogonal subspace. This characterization is in a form that allows us to adapt modern methods of linear prediction for estimating mode parameters.

## 211 Duration Mismatch Negativity in High-Risk Populations for Schizophrenia

LARA PANTLIN

Department: Psychology

Recent research targets clinically high-risk populations and uses mismatch negativity (MMN) to provide predictive information regarding the onset of psychosis. The present study hypothesis was that high-risk participants would have attenuated MMN amplitudes compared to healthy controls. The 16-item Prodromal Questionnaire screened participants (N = 28). An EEG recorded brain waves while participants listened to 2880 randomized tones (Standard=500ms; Deviant 1=425ms; Deviant 2=250ms). The high-risk group retained lower mean amplitudes, but differences were not significant. Results may provide a useful tool for identifying students who appear high-functioning, but may be at-risk to later develop psychosis.

## 212 Effects of Sea Spray on Marine Clouds

CASEY PATRIZIO

Department: Atmospheric Science

Sea spray, the production of aerosols composed of salt and organic matter by bubble bursting at the ocean's surface, is a major component of primary marine aerosol emissions. The results of several studies, where laboratory experiments and model simulations were used to investigate the effects of organic matter in sea spray on cloud condensation nuclei (CCN), are summarized. Organic matter is largely shown to decrease CCN activity, especially in regions of high biological activity. Overall, better measurements on sea spray composition and emissions are required in order to more accurately model the effects on marine clouds.

## 213 Mechanics and Cytocompatibility of Nanofiber Polymer Scaffolds

HANNAH PAULY

Department: Interdisciplinary - Bioengineering

The field of tissue engineering strives to create scaffolds that can interact with cells and cell signaling factors to replicate or repair biological tissues. Electrospinning is a technique that is used to create biocompatible polymer scaffolds that possess a complex nanoscale structure. Before a tissue engineered scaffold can be clinically implemented it is important to understand the mechanical properties of the scaffold and how cells are able to interact with it. The mechanical properties and response of cells to electrospun scaffolds suggests they may be useful clinically.

## **214 Triple Bottom Line Entrepreneurship - Talent Factory Guatemalan Social Enterprise**

**CHRISSA PERCIVAL**

Department: College of Business

The Global, Social and Sustainable Enterprise MBA program focuses on a triple bottom line (planet, people, profit) approach of social enterprise to solve global challenges such as poverty, disease, environmental destruction and energy conservation. The backbone of the program has teams of students from diverse backgrounds creating social ventures that directly address these problems at grassroot levels in a sustainable manner. Talent Factory, one such team, is a social enterprise that offers youth a safe and affordable mechanism to access the opportunity to choose a career through an online peer-to-peer lending platform that provides no interest funding for vocational training.

## **215 Phosphatase Inhibitors Favor the Trigonal Bipyramidal Transition State Geometries**

**BEN PETERS**

Department: Chemistry

The phosphorylation reaction is a critical part of signal transduction in cells in which proteins can be altered by adding or removing a phosphate group from a protein thus turning “on or off” pathways for metabolism or other cellular functions. Over the past couple decades there have been many studies on phosphatases, how they remove phosphates and their interactions with inhibitors. Here we conducted a comprehensive search on phosphatases and their interaction with oxometalate inhibitors to determine the geometry of the complex formed when the inhibitor binds to the phosphatase.

## **216 Effects of Natural Gas Development on Neonatal Mule Deer Survival**

**MARK PETERSON**

Department: Fish/Wildlife/Conservation Bio

Extensive natural gas development on public lands has elevated concern among stakeholders, wildlife managers, and researchers about the impacts on mule deer (*Odocoileus hemionus*) populations. Estimates of survival and cause-specific mortality were derived from a sample of radio-collared neonates (newborns) captured in 2012, 2013, and 2014 using vaginal implant transmitters inserted in adult females. In 2012 - 2014, neonatal survival estimates were higher in undeveloped areas compared to developed areas and predation was the leading cause of mortality in the Piceance Basin, Meeker, CO. Overall, our goal is to provide results promoting improved energy development mitigation and wildlife management practices.

## **217 Improving the Quality of Extreme Precipitation Estimates Using Satellite Retrievals**

**VELJKO PETKOVIC**

Department: Atmospheric Science

Satellite microwave rainfall retrievals currently base their land algorithms on the global-mean relationship between high frequency brightness temperature depression (ice scattering) and rainfall rate. Sensitivity of the retrieval to changes in the amount of ice in the cloud

relative to rainfall leads to systematic biases of the rainfall estimate. These biases are seen not only during extreme precipitation events but whenever a difference between the observed and assumed ice-to-rain ratio exist. We investigate how understanding the link between the large scale environment and ice-to-rain ratio can improve satellite extreme precipitation estimates.

## **218 Nitric Oxide Signaling in Sinus Gland of the Green Crab**

**NATALIE PITTS**

Department: Interdisciplinary - Cell and Molecular  
Biology

Molting in decapod crustaceans is regulated by molt-inhibiting hormone (MIH), a neuropeptide released from the sinus gland (SG) located in the eyestalk ganglia. Release of MIH from the SG suppresses molting. The hypothesis is that a gaseous neuromodulator, nitric oxide (NO), depresses the frequency and/or amount of MIH released from the SG. The data indicates that NO in the SG is sequestered by an endogenous binding protein, allowing for prolonged release of the gas. To the best of our knowledge, this is that first experiment to quantify NO production and provide evidence of a NO binding protein in a crustacean.

## **219 Creating Public Literacy: Reading Text and Image in Broadside Ballads**

**COURTNEY POLLARD**

Department: English

This project is an exploration of how English broadside ballads of the seventeenth century are multimedia texts that create and propagate public literacy. The font, language, and literary devices used in the texts of ballads made them readable by people of varying textual literacy levels. Additionally, the text-image relations of ballads allowed illiterate audiences to become visually literate through “reading” the images of the ballads. Since broadside ballads were most accessible and most commonly read in the public sphere, they contributed to the creation of public forms of literacy.

## **220 Developing a Bacteriophage-Based Vaccine against *Mannheimia haemolytica* for Ruminants**

**SHERIDAN POTTER**

Department: Microbiology, Immunology and Pathology

*Mannheimia haemolytica* is a prominent pneumonic bacterial pathogen, causing substantial economic loss in the domestic sheep and cattle industries, as well as contributing to bighorn sheep population declines. Vaccines that are simultaneously safe, easily disseminated and economical are currently unavailable. Therefore we genetically modified a commercially available bacteriophage to express epitopes from the primary virulence factor of *M. haemolytica* (leukotoxin A) and an immune-enhancing antigen on the surface of the phage capsid. This novel bacteriophage will act as a self-replicating vaccine capable of being delivered orally in feed, which is the most cost-effective and efficient means of vaccinating ruminant populations.

## **221 Rearing Practices as Training for Preschooler's Social Problem Solving Skills**

**SARAH PRENDERGAST**

Department: Human Devlpmt and Family Studies

Social problem solving skills (SPSS) are important to children's social-emotional development and academic achievement. Parenting practices influence the strategies children utilize to solve social problems. In order to better understand the origins of SPSS, data were collected from 193 mothers and children enrolled in Head Start. Mothers completed a battery of assessments, including the Social Skills Rating System. Children were administered Spivak and Shure's Preschool Interpersonal Problem-solving (PIPS) Test. Results indicate that children's social skills and aggression on the SSRS were related to their ability to solve SPSS tasks. Social cognitions were related to SPSS while disciplinary practices were not.

## **222 Making Meaning from Parental Conflict: Perspectives from Emerging Adulthood**

**AMY QUINN**

Department: Human Devlpmt and Family Studies

Marital conflict is multidimensional and the effects of marital conflict on youth can range from constructive to extremely negative. Emerging adults are in a unique position to understand the influence of parental conflict: many are still affected by parental conflict but are also mature enough to reminisce about how their parents' conflict has affected them over time. Current theory suggests that marital conflict affects offspring through the youth's emotional and cognitive responses to parental conflict. This study's goal is to quantitatively and qualitatively examine youth meaning making to contribute new information about the effects of marital conflict on emerging adults.

## **223 An Automated Microenvironmental Aerosol Sampler for Location/Activity Exposure Assessment**

**CASEY QUINN**

Department: Environmntl and Radiologicl Hlth

The automated microenvironmental aerosol sampler (AMAS) is a low-cost, wearable device containing filter-pump assemblies designed to measure personal exposure to air pollution for both panel-based epidemiological studies as well as 'citizen science' applications. A novel aspect of this device is that it collects particulate matter from within distinct personal microenvironments (such as at home, at work, and in transit). The device operates autonomously, using data from on-board sensors to determine when an individual enters a given microenvironment and then initiates sampling through one of three micropump-filter assemblies.

## **224 Age-Associated Impairments in Muscle Hemodynamics during Non-Steady-State Exercise and Recovery**

**MATT RACINE**

Department: Health and Exercise Science

Muscle blood flow during steady-state exercise is impaired in older adults, but the age-associated hemodynamic changes during non-steady-state exercise remain unclear. In young ( $23 \pm 4$  years) and old-

er ( $65 \pm 5$  years) adults, we measured forearm hemodynamics during 3 minutes of rhythmic handgrip exercise at a low and high workload (1.5 minutes each, randomized order) and 2 minutes of post-exercise recovery. Throughout exercise and recovery, forearm hemodynamics were 20-40% lower with age and the cumulative age-associated deficit in blood flow increased ~2-4-fold from 1.5 minutes to end recovery, which could adversely affect muscle perfusion during activities of normal daily living in older adults.

## **225 Obesity Alters Select Routine Blood-Work Parameters in Clinically Healthy Dogs**

**LAUREN RADAKOVICH**

Department: Micrbiolgy, Immunolgy and Pathology

Obesity is a major worldwide health problem for people and their companion pets, especially dogs. Obesity is associated with a state of chronic low-grade inflammation, which causes a multitude of problems including insulin resistance, pro-coagulability, osteoarthritis, and numerous other maladies in both humans and dogs. As obesity is a growing concern, it is important to understand how it may affect routine screening tests used by physicians and veterinarians. This study examined routine blood-work parameters in clinically healthy lean and obese dogs. Parameters that were significantly different were often attributed to increased levels of inflammation in the obese dogs.

## **226 Damage Accumulation Modeling of Spinal Dura Mater**

**NICOLE RAMO**

Department: Interdisciplinary - Bioengineering

Suffering a spinal cord injury (SCI) can be physically, emotionally, and financially devastating. These injuries occur when tissues of the spinal cord-meningeal complex are loaded to the point of sub-failure or full thickness damage. In order to better understand SCIs, knowledge of how these tissues incur damage and ultimately fail is critical. This work presents a mathematical model that characterizes the damage accumulation process of dura mater, the outermost and strongest meningeal layer. The results obtained provide insight into the complexity of spinal soft tissues and will be used to improve the accuracy of SCI simulations and SCI prevention efforts.

## **227 Role of Monocyte Recruitment in Hemangiosarcoma Metastasis in Dogs**

**DAN REGAN**

Department: Micrbiolgy, Immunolgy and Pathology

Canine hemangiosarcoma is a malignant tumor associated with poor survival due to rapid metastasis. In humans, monocytes drive metastasis through promoting tumor cell seeding, and angiogenesis. To address the role of monocytes in canine tumor metastasis, immunohistochemistry for CD18 was performed on metastatic canine tumors, which showed that monocyte infiltration was greatest in hemangiosarcoma metastases. Next, migration assays confirmed hemangiosarcoma cells were among the strongest at stimulating monocyte migration, and in producing the monocyte chemoattractant CCL2. These findings suggest that immunotherapies designed to block monocyte recruitment may be an effective adjuvant strategy for suppressing metastasis in dogs with hemangiosarcoma.



## **228 Possible Protective Effect of Poloxamer 188 in Meniscus**

**KATE REMLEY**

Department: College of Engineering

With the rise of recreational sports, knee injuries are increasingly common often leading to post-traumatic osteoarthritis. Preventative methods need to be taken immediately after injury to slow degradation of the joint. Poloxamer 188 (P188) is a nonionic amphilic copolymer shown to prevent cell death in vitro in articular cartilage by insertion into damaged cell membranes. Before P188 can be applied clinically, its effect on other tissues within the joint must be examined.

## **229 Spin Waves in a Thermal Gradient**

**GRANT RILEY**

Department: Physics

Recent interest in spin caloritronics has motivated a dynamic characterization of travelling spin waves or magnons in magnetic media with various thermal profiles. Brillouin light scattering (BLS), a spectroscopy technique that relies on the inelastically scattering of light from magnons, offers a non-invasive means to map out spin waves in two dimensions. Here we used BLS to explore the effects of a thermal gradient on propagating spin waves in a yttrium iron garnet thin film. The measurements reveal a large amplification in spin wave intensity when the spin waves travel into a hot region.

## **230 The Availability of Grandparent Provided Childcare: A Research Proposal**

**OZYMANDIAS ROBERTS**

Department: Economics

There are a great number of studies which find that the effect of childcare subsidies is an increase in women's labor force participation, mobility, and fertility. In American studies we see that grandparent provided childcare (GPCC) is of a much higher quality, on average, than center based care suggesting that there is room for further research into the availability of GPCC. I propose to fill this gap in the literature by studying which variables influence the choice to provide care. Health, wealth, marital status, and proximity, as well as many other variables may affect whether grandparents choose to offer care.

## **231 Literature Review on Bolt Failure for Mitre Lock Gate Pintles**

**SANTIAGO RODRIGUEZ LOPEZ**

Department: Civil and Environmental Engineering

The purpose of this project is to understand why critical structural bolts fail so quickly in heavy water-canal lock gates. The procedure followed was a literature review of research done on bolt failure. The conclusion is that two processes may be in play. One is a loosening phase due to cyclic shear loads and the next is subsequent fatigue that leads to failure. The implications of this are first that there is significant room for deeper understanding of both of these processes and furthermore that an improvement of the design specifications is necessary.

## **232 Neutrino Interactions on Carbon Nuclei**

**PAUL ROJAS**

Department: Physics

The Tokai-To-Kamioka (T2K) Experiment is a long baseline neutrino experiment designed to study neutrino oscillations. A neutrino beam is sent 295km west from Tokai, Japan towards our far detector in Kamioka (Super-K); with a near detector (ND280) 280m downstream from the beam source. I will present my work on measuring a charged current neutrino interaction cross-section on carbon using the scintillation bars in the Pi-Zero Detector inside of ND280.

## **233 An Engineered Bone Coating for Reconstructing Large Bone Defects**

**RAIMUNDO ROMERO**

Department: Interdisciplinary - Bioengineering

Load bearing bone defects pose a unique and challenging clinical problem. Clinical intervention consist of a bone graft capable of immediate mechanical support. Unfortunately, these types of bone grafts require a large amount of donor tissue and have a 60% failure rate after 10 years due to weak mechanical union. Some bone grafts, such as bone allografts, are extensively cleaned to remove cell and protein material that is crucial to bone healing. Our developed novel polysaccharide bone coating is hypothesized to enhance bone allograft healing by restoring lost cells and proteins involved in the bone healing process.

## **234 Organizational Identity: Implications for Business Ethics Education**

**MATTHEW ROTHSTEIN**

Department: Philosophy

The emphasis of business ethics education in the wake of corporate scandal and a major banking crisis centers on fostering behaviors constrained by moral considerations. But organizations by their very nature tend to resist such moralization, and empirical evidence lends support to the idea that the individual, while in possession of an independent moral disposition, is unlikely to maintain this level of morality while participating in the competitive marketplace as part of an organization. My presentation promotes an approach to business ethics that fosters individual moral education, and resists the mere 'window dressing' of corporate moral identity.

## **235 After School Programs: Catalyst for Reducing Disparities in STEM Fields**

**AMY RUBINSON**

Department: School of Education

This research attempts to determine relationships between academic success, community cultural wealth, and the influence of racism all as related to People of Color persisting to STEM careers. Specifically, this research shows the amount of community cultural wealth Youth of Color develop during an after school program. The research is guided by one large research questions: How can after school programs contribute to reducing demographic disparities in STEM fields? The research is framed by four theories: critical race theory, bioecology, community cultural wealth, and social identity theory.



## **236 Flood Frequency Analysis Uncertainty: Cache la Poudre River Case Study**

**ERIN RYAN**

Department: Civil and Environmental Engineering

Climate change is ushering in new uncertainties for water resources management. Conventional flood frequency analysis methods are reviewed using maximum likelihood estimation to fit three probability distributions to the Cache la Poudre River's annual peak discharge record. The non-fat-tailed Log-Pearson Type III distribution (the current United States standard) and two fat-tailed distributions, Greatest Extreme Value and Log-Logistic, were analyzed. The Log-Pearson Type III distribution was also fit using logarithmic moment sampling via the US Geological Survey's PeakFQ software. Results suggest that PeakFQ remains a relevant hydrological tool, but the Greatest Extreme Value distribution may prove more useful in the future.

## **237 Super-Resolution Imaging of Actin on the Membrane of Mammalian Cells**

**SANAZ SADEGH**

Department: Electrical and Computer Engineering

Single-molecule methods show that proteins on the mammalian cell membrane exhibit transient confinement mediated by the actin cytoskeleton. However, direct visualization of the membrane compartmentalization by the underlying cortical actin structure is experimentally challenging because of the need for spatial resolution beyond the diffraction limit and high temporal resolution. We employ dynamic photoactivated localization microscopy (PALM) and image the cortical actin with 40-nm resolution, while we simultaneously track individual membrane proteins that interact with the actin cytoskeleton. We find that individual ion channels are confined within compartments formed by the cortical actin for times up to several seconds.

## **238 Planning Inspection of Cracks in Concrete Bridge Decks Using Uncertainty**

**PATRICK SANDERS**

Department: Civil and Environmental Engineering

The current bridge inspection program in the United States does not effectively use inspection resources. My research aims to provide a possible solution using the cracking in concrete bridge decks as an example. Here, inspection is viewed as a solution to uncertainty, not for determining bridge rehabilitation. Using deterioration models, the percent deck area cracked and the uncertainty in this output can be determined. The uncertainty in some inputs contribute the most to overall uncertainty, and this is what determines the need for inspection. This leads the way for application to other bridge components, and a more efficient inspection program.

## **239 Injunctive Normative Messages and Effective Visual Aids**

**PERLA SANDOVAL**

Department: Psychology

Normative behavioral interventions can help curb the growing demand of energy use through descriptive and injunctive normative messaging. The effectiveness of various visual injunctive normative messages was examined. Based on their conservation behavior score, participants were randomly shown posters that conveyed their conservation behav-

iors below or above the average CSU student. Participants were randomly shown 1 of 4 images; no image, a light switch, a happy/sad group of students, or a smile/frowning emoticon. Participants were asked to summarize the takeaway message of the poster that they viewed. Responses will be coded for injunctive normative descriptors and analyzed across conditions.

## **240 Economic Gender-Bias of the Military Industrial Complex**

**TYLER SAXON**

Department: Economics

My submission focuses on how the jobs created by the military industrial complex (MIC) affect men and women differently in the United States: through the millions of jobs offered by the military-related branches of the US federal government, and through jobs created in high-tech industries, including defense contractors, which have been created as a result of the technological research subsidized by defense spending. Labor statistics show that both types of jobs are filled mostly by male employees, implying that the U.S. federal government is creating many more jobs for men than for women through the MIC mechanism.

## **241 L.C.C.A in Bike Sharing Systems**

**MOHSIN SAYED**

Department: Construction Management

Bike sharing initiatives have been on the rise especially after it has been comprehended as an efficient system to reduce the environmental impact of a public transportation system as well as a healthy alternative to commute. Implementation of the bike sharing system has seen success in major cities across the US. How can this sharing system be implemented all around US? Questions arise about the feasibility of the system to survive successfully; which can be answered or researched by considering the "Life Cycle Cost Analysis of the Bike sharing system."

## **242 Methods for Quantitative Analysis in Plant Synthetic Biology**

**KATHERINE SCHAUMBERG**

Department: Interdisciplinary - Bioengineering

Synthetic biology often requires the quantitative characterization of genetic components. This enables predictions of synthetic network properties constructed from these components. However obtaining quantitative data from plants is time consuming, and development of stable transformed plants can take months to years. An attractive alternative is the use of transient protoplast assays for quantitative testing of components, followed by computational prediction of the best performing circuits. Adoption of this work-flow would enable the development of plant synthetic biology based on rational design principles. Here we present a method for prediction of synthetic network properties.

## **243 Halogen Bonds in T4 Lysozyme**

**MATTHEW SCHOLFIELD**

Department: Biochemistry and Molecular Biology

Halogen bonds are a weak non-covalent electrostatic interaction that has recently gained recognition within the last 10 years. Unfortunately, it hasn't been studied heavily in the context of protein systems. Our research focuses on studying how halogen bonds can influence protein structure and stability. To study this system, halogenated amino acids

are mutated into T4 Lysozyme at specific sites that are likely to form a halogen bond. X-ray crystallography and differential scanning calorimetry are used to characterize the interaction. Our research will help scientists engineer more stable proteins and develop better and safer halogenated drugs.

## **244 Constituting Bio-Parents: Charland's Constitutive Rhetoric and Anti-Vaccination Discourse**

**JENA SCHWAKE**

Department: Communication Studies

In 2014, several U.S. cities reported a significant increase in measles cases. Many news outlets attributed this outbreak to growing numbers of anti-vaccination supporters. Anti-vaccination discourse has proliferated due to the availability of vaccine information on the Internet. Here, I examine the movement through an analysis of the National Vaccine Information Center and the ways the organization employs constitutive rhetoric to advance claims and garner support. I contend NVIC creates a constituency of "bio-parents" through identification, memorialization, and narratives of responsible parenting. Finally, I conclude with the implications of NVIC's rhetorical strategies for discourses vaccination, and public health.

## **245 Beefxide® used to Reduce Salmonella and Escherichia Coli on Beef**

**BRITTNEY SCOTT**

Department: Animal Sciences

This study validated that (i) inoculants of non-pathogenic *Escherichia coli* effectively served as surrogates for pathogenic *Escherichia coli* O157:H7, non-O157 STECs, and *Salmonella* spp. when warm beef carcass tissue was treated with Beefxide®, (ii) Beefxide® at two temperatures, pressures and concentration levels was an effective antimicrobial intervention when applied to warm beef carcass surface tissue inoculated with surrogates and pathogens when used in a spray cabinet, (iii) and the non-pathogenic surrogates effectively validated the use of hot-water pasteurization in combination with Beefxide® as a carcass spray in a commercial beef harvest facility.

## **246 Evaluating the Efficacy of a New Range and Pastureland Herbicide**

**DEREK SEBASTIAN**

Department: Bioagricultural Sci and Pest Mgt

Downy brome (*Bromus tectorum*) and feral rye (*Secale cereale*) are two annual grass species that have rapidly spread throughout many regions of the United States. It has been estimated the Western United States rangeland is infested with over 50 million acres of downy brome. These two highly competitive species favor disturbed areas such as roadsides, overgrazed pastures, and abandoned crop fields. The main purpose of this study was to evaluate the efficacy of indaziflam for controlling these two annual grass species. These studies show indaziflam has the potential to outperform the industry standards used in range and pastureland restoration.

## **247 Environmentally Induced Copy Number Variation in Yeast**

**RABAB SHARIF**

Department: Environmental and Radiological Health

Genome rearrangements result in copy number variations (CNVs) that have been recognized as contributing factors in cancer and in autism spectrum disorder. We investigated CNV formation mechanisms in yeast cells following induction by ionizing radiation exposure by employing two assays for CNV detection. Our first assay takes advantage of two genes, *SFA1* and *CUP1*. Our second approach was to use a non-allelic homologous recombination assay. Cells from both assays were exposed to two gamma radiation doses (50 Gy, 200 Gy). In both cases, radiation exposures induced significant increases in the CNV rate compared to uninduced cultures.

## **248 Predicting New Prion Candidates in Yeast**

**JENIFER SHATTUCK**

Department: Biochemistry and Molecular Biology

Prions are infectious proteins capable of self-propagating and transmitting between organisms. Even though there is no homolog to the mammalian prion protein in yeast, several soluble proteins can form heritable aggregates de novo. Using a prion prediction algorithm, we scanned the yeast proteome to select proteins that contain domains predicted to have prion activity (prion-like domains). These prion-like domains were tested in four prion activity assays to assess their activity in vivo as well as in vitro. Here we provide a preliminary dataset for the prion activity of our prion protein candidates.

## **249 Emerging Roles of Synaptotagmin in Neurogenic Disease**

**MALLORY SHIELDS**

Department: Biomedical Sciences

Synaptotagmin, is widely known as the fast, synchronous  $Ca^{++}$  sensor that mediates neurotransmitter release. Due to its essential nature, many synaptotagmin mutations result in early lethality in these animal models. Recently, whole-exome sequencing has demonstrated mutations in synaptotagmin are associated with human disease. Multigenerational dominant deficits have been linked to a single point mutation in synaptotagmin's C2B domain. With a view to identifying the molecular mechanisms underlying the human phenotype, we have generated an homologous point mutation in the C2B domain of *Drosophila* synaptotagmin.

## **250 Learning about Animal Welfare through Competitive Judging Teams**

**CHELSEY SHIVLEY**

Department: Animal Sciences

The scientific study of animal welfare involves complex assessments of an animal's physical health, emotional state, and naturalness of its environment. An animal welfare judging contest was created in 2002 to teach students about the complexities of animal welfare. The contest uses scenarios with information on performance, health, physiology, and behavior of animals. The students evaluate the scenarios to de-

termine which facility had the best welfare, and defend their decision through oral reasons presented to judges. The competition now has undergraduate, graduate, and veterinary divisions. CSU is new to the competition, and has had successful teams in all three divisions.

## 251 Rocky Mountain Climate Change: Range Shifts of a Native Beetle

AARON SIDDER

Department: Interdisciplinary - Ecology

This research will determine the past, present, and future geographic range of the mountain pine beetle in the Rocky Mountain region of the U.S. Climate change has altered thermal regimes in subalpine forests and exposed novel environments to beetle infestation, which has contributed to recent epidemic outbreaks. This analysis uses statistical modeling techniques (species distribution models), publicly available aerial detection survey data, and historic, contemporary, and projected climate data to assess how the beetle's climatically suitable range has shifted over the past 70 years and how it may change under future climate scenarios.

## 252 Student Cliques and Creativity

HILLARY SMITH

Department: Design and Merchandising

Creativity, the creation of something new and original and perceived useful. Producing creative work is not just a staple of the interior design profession, it is an expectation. Many social and environmental factors can have negative impact on a student's ability to produce creative ideas. Group think is one of these factors, and research has shown group think to have negative impact on the student's ability to think independently and create original ideas (Johnson & Weaver, 1992). Thus this research aims to understand how student friendships and cliques could affect originality of interior design student projects.

## 253 The Stability of a Simulated Model-Glass Created by Cooling

HANNAH STALEY

Department: Physics

Vapor deposition is used to create glasses that are much more stable than those obtained by cooling. To understand properties of stable glasses, computer simulations of vapor deposition and of random pinning have been used to create and examine properties of simulated stable glasses. However, little is known about the stability of simulated glasses that are created by cooling at a constant rate. We create simulated glasses by cooling a model glass-former at different rates. We examine the glass's stability by measuring the average potential energy, the average inherent structure energy, the dynamics upon reheating, and the shear modulus.

## 254 The Sense of Novelty: Is Novelty the Inverse of Familiarity?

SHELLY STALEY

Department: Psychology

What leads to the sense of novelty with something? One theory is that novelty is the inverse of familiarity. Familiarity strength has been shown to correspond to the degree of feature-match between a current situation and one or more in memory. We examined whether novelty is the inverse of this.

## 255 Exploring the Relationship between Parent and Child Physical Activity

ERIN STRUTZ

Department: Health and Exercise Science

To engage parents or children as agents of change to increase physical activity (PA) at the family level, it is critical to understand the relationship between parent and child PA. The purpose of this study was to employ high-frequency accelerometry (ACC) to explore parent-child PA correlations across a large sample of free-living data from 191 4th and 5th grade children and their parents. Overall, weak positive correlations were found between the percent of time parents and children engaged in moderate-vigorous PA, thus suggesting that parents or children alone might not be successful agents of change for the entire family.

## 256 Plasma Modified SnO<sub>2</sub> Nanomaterials and Their Gas Sensing Capabilities

ERIN STUCKERT

Department: Chemistry

Efforts to create more sensitive and selective gas sensors to detect toxic gases have long been explored; yet limitations remain in sensing capabilities for numerous gases. Tin(IV) oxide (SnO<sub>2</sub>) nanomaterials have shown great improvement over previous materials. These materials are further improved through plasma modification (Ar/O<sub>2</sub> and H<sub>2</sub>O), which increases surface oxidation that results in enhanced gas-surface interactions. These increased interactions create more sensitive gas sensors shown by greater resistance changes when the sensors are exposed to air. Specifically, higher power Ar/O<sub>2</sub> treatments result in greater oxidation and sensitivity than from H<sub>2</sub>O treatment, which also resulted in Sn reduction.

## 257 Detection of Antigenic Proteins of Felis Catus Gammaherpesvirus 1

KAT STUTZMAN-RODRIGUEZ

Department: Microbiology, Immunology and Pathology

FcaGHV1 is a new gammaherpesvirus; the subfamily also includes human cancer-associated herpesviruses, Epstein-Barr virus and Kaposi's sarcoma-associated herpesvirus. To determine which viral proteins elicit an antibody response in naturally occurring infections of domestic cats, we chose seven FcaGHV1 proteins which are conserved across the subfamily and antigenic in other gammaherpesviruses. We generated these seven recombinant FcaGHV1 proteins in a feline cell line. Using immunofluorescent antibody staining, we tested reactivity of fixed cells with sera from nine cats naturally infected with FcaGHV1. Our data indicate that two capsid proteins and two tegument proteins elicit antibodies during naturally occurring FcaGHV1 infection.

## 258 Engineering ORCA3 and SGD in Catharanthus Roseus increase Alkaloid Production

JIAYI SUN

Department: Chemical and Biological Engineering

Catharanthus roseus produces many clinically important alkaloids like vinblastine and vincristine through the terpenoid indole alkaloid pathway. Genetic engineering of single or two key pathway genes in Catharanthus roseus hairy roots have been used to increase desired al-



kaloid for decades. However, it led to limited success due to the tight regulation of the pathway or by other rate-limiting enzymatic or transport steps. Transcriptional regulator ORCA3 plays a central role in regulating the TIA pathway. In this study, co-overexpressing ORCA3 and the pathway gene SGD which is not controlled by ORCA3 significantly increase downstream alkaloids and the total alkaloid pool.

## **259 Monitoring Internal Temperatures and Kinetics in Nitrogen- and Oxygen-Containing Plasmas**

**ERIKA SUTOR**

Department: Chemistry

The contribution of anthropogenic emissions, specifically NO<sub>x</sub>, on Earth's climate change processes and the minimization of their effects continues to be of interest in the scientific community. The use of plasma-assisted catalysis is a promising step towards NO<sub>x</sub> elimination from exhaust streams. Fundamental knowledge of N<sub>x</sub>O<sub>y</sub> plasma system dynamics is a key step towards a potentially commercializable plasma catalysis system. By implementing time-resolved optical emission and broadband absorption spectroscopies, the effects of varying precursor gases on species densities and the energy partitioning in the system can be explored as a function of applied rf power and system pressure.

## **260 A Real-Time Building HVAC Model Plug-in for SketchUp™**

**ZAKER ALI SYED**

Department: Mechanical Engineering

One of the greatest challenges faced by humanity is the impact on climate due to human activity. Among the most prominent of these activities is the construction of buildings. As time and technology progresses, the need for more efficient and environmentally-friendly processes and materials is gaining favor among the general population. In line with this, various government protocols have been implemented which have led to development of various software applications that assist in designing better buildings. However, the reach of these applications is limited owing to the cost and expertise needed to actually use these software applications.

## **261 Effect of Inflammation on Bone Marrow-Derived Mesenchymal Stem Cell Chondrogenesis**

**SUWIMOL TANGTRONGSUP**

Department: Clinical Sciences

Healing of articular cartilage defects by mesenchymal stem cells (MSCs) may be hindered by proinflammatory mediators in the synovial fluid of diseased joints. Here we tested the effects of proinflammatory mediators on adult equine MSC chondrogenesis in vitro. MSCs were cultured in chondrogenic medium containing proinflammatory mediators: interleukin-1 beta (IL-1) or ligands for toll-like receptors 2 or 4. Glycosaminoglycan and prostaglandin E<sub>2</sub> (PGE<sub>2</sub>) was quantified as indicators of chondrogenesis and inflammation, respectively. Suppression of chondrogenesis was positively associated with increasing levels of inflammation, with the highest level of inflammation occurring with exposure to IL-1.

## **262 Stable Microtubule Attachment to Kinetochores Silences the Spindle Assembly Checkpoint**

**ERIC TAUCHMAN**

Department: Interdisciplinary - Cell and Molecular Biology

During mitosis, sister chromatids attach to microtubules through large protein complexes called kinetochores. Without stable kinetochore-microtubule attachments, the cell will inhibit anaphase onset via the spindle assembly checkpoint (SAC). Precisely how the inhibitory SAC signal is extinguished remains unresolved. To address this, we induced the formation of hyper-stable kinetochore-microtubules in human cells using a non-phosphorylatable version of the kinetochore protein Hec1. We find that stable attachments are sufficient to silence the SAC in the absence of sister kinetochore bi-orientation or "tension" between sister kinetochores. Our results suggest that architectural changes produced by stable kinetochore-microtubule attachment serve to quench SAC signaling.

## **263 Examination of Spn1 and Spt6 in DNA Damage Repair**

**ALISON THURSTON**

Department: Biochemistry and Molecular Biology

The DNA in our cells is constantly being damaged due to external factors like the sun or internal such as metabolism. As such, there are numerous DNA damage repair pathways involved in correcting these lesions. Importantly, these repair activities must function in the context of chromatin. Chromatin is comprised of DNA and proteins in an architecture that allows for compaction into the nucleus while allowing access for cellular processes. Specifically, we are interested in how histone chaperones, proteins that establish and maintain chromatin, aid in the repair of DNA damage.

## **264 A Bayesian Statistical Reconstruction of Paleoclimate using Biological Models**

**JOHN TIPTON**

Department: Statistics

Reconstruction of historical climate is important for understanding how climate has changed in the past to understand how climate might change in the future. We develop a Bayesian hierarchical framework using non-linear, biological tree ring growth models to reconstruct multivariate paleoclimate in the Hudson Valley, New York. We allow for species-specific responses to climate, improving estimation and providing biological interpretation of the relationship between tree growth and climate. To enable predictive backcasts, we model the climate on an annual time scale coupled with a monthly multivariate correlation structure that accounts for temporal correlation and cross-correlation, resulting in skillful paleoclimate reconstructions.



## 265 High Repetition Rate Mid-Infrared Ultrafast Laser Source for 2D-IR Spectroscopy

KATHRYN TRACY

Department: Chemistry

A cost effective high repetition rate mid-IR laser source is being developed for nonlinear optical spectroscopy. Specifically, it is designed for two dimensional infrared (2D IR) spectroscopy and microscopy experiments that provide fundamental information about chemical structure and dynamics. The source being constructed is an MgO:PPLN based optical parametric chirped-pulse amplification (OPCPA) system producing mid-IR pulses at repetition rates from 50 to 100 kHz. To date we have demonstrated  $\mu\text{J}$  pulse energies at  $2.67\ \mu\text{m}$  with pulse durations of 200 fs. These pulses are subsequently used to generate a 350 nm FWHM continuum, thus providing improved tunability in the mid-IR.

## 266 “Rise up through the words”: Postcolonial Haitian Uncoverings of Anacaona

OLIVIA TRACY

Department: English

This work analyzes historical representations of Anacaona-- Columbus' Four Voyages, de Las Casas' History of the Indies and A Brief Account of the Destruction of the Indies-- and postcolonial representations-- Jean Metellus' play Anacaona, Danielle Legros Georges' poem “Anacaona,” and Edwidge Danticat's young adult novel Anacaona, Haiti, 1490. Through textual analysis of these works, I argue that these three postcolonial authors are bringing Anacaona's narrative, obscured in many narratives of first contact, to the surface in order to posit the figure of Anacaona as new symbol of postcolonial Haitian identity, one that is grounded in place and a pre-Columbian origin.

## 267 Androgen Regulation of Corticotropin-Releasing Hormone Expression in the Human Placenta

ASHLEY TURNIDGE

Department: Biomedical Sciences

Corticotropin-releasing hormone (CRH), a well-known component of the stress responsive hypothalamic-pituitary-adrenal (HPA) axis, is also present in the human placenta. Here, synthesis of CRH stimulates the production of androgens, but little is known about the role androgens play in regulating placental CRH expression. Thus, this study utilizes three human placental cell lines treated with the non-aromatizable androgen,  $5\alpha$ -Dihydrotestosterone (DHT), or control ethanol, flutamide and dexamethasone solutions, to investigate this relationship. Preliminary results suggest that DHT treatment upregulates both CRH mRNA and protein expression; and, once confirmed, these results will further our understanding of androgen regulation of CRH in the placenta.

## 268 Guinea Pigs, Tuberculosis, and Negative Results- a Research Conundrum

WENDY TUTTLE

Department: Microbiology, Immunology and Pathology

Guinea pigs are a commonly used animal model to study infectious disease due to their similarities with the human immune system. Unfortunately, guinea pigs are also experts at masking disease signs. Our work looks at biomarkers for detecting illness in guinea pigs experimentally infected with *Mycobacterium tuberculosis*, and the implications of overwhelmingly negative results.

## 269 Examining Food Insecurity and Gender Equality in Rural Senegal

ADEL UHLARIK

Department: Coll of Agricultural Sciences

Women play a significant role in agricultural production while executing domestic duties in the majority world. This project's purpose was to confirm gender equality was key to food security as I served in Peace Corps/Senegal. Initially I was led by my own theory while searching for the silver bullet against malnutrition instead of being guided by locals to discover drivers of food insecurity in the field. I quickly realized my theory was wrong and I surrendered the priorities of this project to the village in which I lived and worked over the course of two years.

## 270 Access to Information is the Key for CBRM in Mongolia

TUNGA ULAMBAYAR

Department: Forest and Rangeland Stewardship

Community-based rangeland management (CBRM) is a growing trend in Mongolia, yet little is known about the factors that influence success or lack thereof. Using data from 142 pastoral communities, we explored causal factors for social outcomes of CBRM. We examined if the effect of formal CBRM on social outcomes was mediated by information diversity, leadership, knowledge exchange and agreed rules. We found that traditional and innovative rangeland practices, proactiveness and social networks were mediated by four variables. Among four interdependent mutually-enforcing mediators, information diversity had the strongest effect on other three variables creating a causal chain of information diversity, leadership, and knowledge exchange rules.

## 271 A Mindfulness-Based Stress Reduction Intervention on Healthcare Worker Safety

MORGAN VALLEY

Department: Psychology

Occupational injuries represent a significant public health problem among healthcare workers. This project used a randomized controlled trial to determine if mindfulness training, which teaches individuals to bring awareness and acceptance to the present moment, decreases momentary mental lapses and improves self-reported worker safety performance. Twenty-three hospital healthcare workers were randomized to either a control group or the mindfulness intervention group. We used RM ANOVA tests to compare the main baseline and post-intervention effects both between and within groups. Results suggest that mindfulness training can decrease workplace mental lapses and increase safety performance, particularly safety compliance, among hospital healthcare workers.

## **272 Impacts of Electric Fences on Mitigating Human-Elephant Conflict**

**MARCIA VAN EDEN**

Department: Human Dimensions of Nat Res

Our research examined the effects of using electrified fencing to protect communities from crop raids by elephants in the Laikipia district of Kenya. Using community surveys, GPS mapping, and key informant interviews, perceived and observed effects of the West Laikipia Fence (built to separate crop raiding elephants from farmers) were compared between communities of high and low incidences of crop raiding. Our results are assisting local protected areas in determining appropriate fence management plans as well as providing insights into potential community engagement programs in the region.

## **273 Spatial Rents to Agritourism from Natural Amenities and Populations**

**ANDERS VAN SANDT**

Department: Agricultural and Resource Econ

Agritourism is a growing industry in the United States in part because it acts as an alternative revenue source allowing smaller farms to stay profitable and competitive. This research seeks to fill a gap in the literature by addressing how the spatial distribution of natural amenities, outdoor attractions, and populations affect the rents of agritourism establishments. The econometric model makes use of admittedly sub-optimal empirical data, but interesting results consistent with the literature are still obtained. Major results indicate agritourism revenues are more dependent on a county's rurality level and distance to outdoor attractions than their distance to large cities.

## **274 Exploring the Role of 5-HydroxymethylCytosine in Homologous Recombination**

**CRYSTAL VANDER ZANDEN**

Department: Biochemistry and Molecular Biology

5-hydroxymethylcytosine (5hmC) is an epigenetically modified DNA base that, via interaction with Endonuclease G (EndoG) has recently been linked to DNA recombination, a process involved in DNA replication and repair. The proposed research aims to explore this connection between 5hmC, EndoG, and recombination. The hypothesis is that 5hmC-modified DNA forms unique hydrogen bonds that promote pausing of a migrating DNA Holliday junction, and the paused junction provides a stable substrate for EndoG to bind. This model is explored from a structural perspective by determining the contribution of 5hmC to DNA stability and recognition by EndoG.

## **275 Nature's Democracy: Public Response to Elk Culling in ROMO**

**DANE VANHOOZER**

Department: History

Elk culling in Rocky Mountain National Park (ROMO) is a recurring historical issue. This paper places elk management within the broader context of the struggle to simultaneously manage for wilderness integrity and public enjoyment of national parks. It assesses the dynamics

of managing for divergent objectives in light of the array of public responses to the Elk and Vegetation Management Plan (EVMP). A historical analysis of these responses offers ROMO a useful tool with which to foster constructive public participation in future management decisions.

## **276 A Spatial Analysis of Flood Insurance and Housing Values**

**DAN VILLAR**

Department: Agricultural and Resource Econ

This paper will examine the effect of National Flood Insurance Program reform on housing values across the United States over a two year time period. It is hypothesized that the effects of increasing flood insurance rates through the elimination of established subsidies will be capitalized in home values resulting in a significant loss of value in areas where subsidies are prevalent. Additionally, the model will measure the effect the proportion of subsidized insurance policies has on housing values and if this differs for zip codes with certain demographic or geographic attributes.

## **277 Seeking Metabolomic Associations Related to Therapeutic Diet (S.M.A.R.T) Biomarker Study**

**NOAH VOREADES**

Department: Food Science and Human Nutrition

There is a critical need to develop new biologically-based tools for assessing dietary intake and health outcomes. Global metabolomic-profiling of biological samples (i.e. urine, stool) can provide a non-invasive, objective tool for identifying biomarkers to assess dietary compliance as well as early indicators for disease risk. The SMART biomarker study utilized a crossover dietary intervention that controlled for high and low F&V intake. Stool and urine metabolite profiles will be obtained by UPLC and GC-MS and decision tree learning techniques (i.e. Random forest) will be utilized to develop a model for F&V intake levels that will identify predictive metabolites.

## **278 Relating Mountain Pine Beetle Outbreak Severity to Forest Management History**

**ANTHONY VORSTER**

Department: Interdisciplinary - Ecology

This study sought to understand how the impacts of the mountain pine beetle outbreak in areas that were harvested between 1954 and 1985 compared to areas that were not harvested. We mapped outbreak severity at a 30-m resolution. The outbreak severity at stands harvested between 1954 and 1985 was lower than comparable uncut stands. We then explored the characteristics of cuts associated with low and high outbreak severities. The results suggest that harvesting can be used to lower the risk of a mountain pine beetle outbreak in a stand.

## 279 Behavioral and Ecological Variables Affecting Competition between Parasitic Wasps

DHAVAL VYAS

Department: Interdisciplinary - Ecology

*Cotesia rubecula* and *C. glomerata* are parasitic wasps that compete for the imported cabbageworm (*Pieris rapae*), a major pest of cruciferous crops (e.g., cabbage, broccoli, kale). In North America, when *C. rubecula* is introduced into habitats where *P. rapae* is parasitized mainly by *C. glomerata*, *C. rubecula* becomes the dominant parasitoid of *P. rapae*. We investigate the behavioral and ecological mechanisms underlying the displacement of *C. glomerata*. *Cotesia rubecula*'s competitive edge over *C. glomerata* can be useful for the biological control of *P. rapae*.

## 280 Machine Learning for Solving Vibroseis Quality Control Problems

CHAD WADDINGTON

Department: Mathematics

In Geological surveys Vibroseis data collection methods do not allow for in field image processing or Quality Control. This approach solves that problem by estimating image resolution using indirect accelerometer data from the signal generating truck.

## 281 The Interaction between RNA Polymerase and TFE from *Thermococcus kodakarensis*

JULIE WALKER

Department: Biochemistry and Molecular Biology

Archaea encode a single RNA polymerase (RNAP) that shares homology to eukaryotic RNA Pol II. The main channel of RNAP can only accept DNA when the clamp is in the open conformation. Transcription factor E (TFE) is encoded in archaeal genomes, and TFE can assist pre-initiation complex formation in vitro and appears to be essential in vivo. The molecular details of the interactions of TFE with RNAP, and how such interactions influence the positioning of the clamp are unknown. We are able to employ structure-function analysis of RNAP variants through mutagenesis followed by purification of RNAP variants from *Thermococcus kodakarensis*.

## 282 Access Denied: Identification of a Strategy to Inhibit HIV-1 Infection

SUSANNE WALKER

Department: Biochemistry and Molecular Biology

Peptide drugs offer a modern solution to targeting HIV-1, but challenges involving stability and solubility need to be overcome to provide a better-suited therapeutic. Methods for the stabilization of helical peptide drugs have led to the functional display of a grafted HIV gp41 C-peptide helical mimic on Pleckstrin Homology (PH) domains. C-peptide helix-grafted proteins selectively bind the N-terminal helical region of gp41, a HIV drug target, in a complex cellular environment. Additionally, the helix-grafted GLUE is folded in solution, stable in human serum, and soluble in aqueous solutions, and thus overcomes challenges faced by a multitude of peptide drugs.

## 283 A Low-Cost, High-Throughput, Miniaturized Inertial-Migration-Based Cyanobacteria Concentrator

LEI WANG

Department: Interdisciplinary - Bioengineering

Cyanobacteria are attracting increasing attention as a potential biomass source for commercial production of advanced biofuels. However, the high cost of harvesting micron-sized microalgae cells is one of the key bottlenecks hindering an economically feasible cyanobacteria-based biodiesel industry. Inertial focusing has been demonstrated as an efficient and low-cost technology for particle/cell separation. In this study, we present a low-cost and small-footprint microfluidic device, with throughput comparable to macroscale systems, to efficiently harvest cyanobacterium *Synechocystis* sp. PCC 6803. The operating parameters in this harvesting process were characterized and the harvest efficiency was evaluated.

## 284 Long-Term Engineered Cultures of Mouse Hepatocytes for Genotype-Phenotype Studies

BRENT WARE

Department: Interdisciplinary - Bioengineering

Drug-induced liver injury (DILI) continues to be the leading cause of acute liver failures in humans. Preclinical trials required by the FDA often feature genetically homogeneous animals that neglect the role of genetics in DILI. With a wide variety of genetic strains available, in vitro cultures of mouse hepatocytes could supplement these whole animal studies for high-throughput screening, yet conventional cultures rapidly decline in hepatic functions. We have incorporated mouse hepatocytes into a micropatterned co-culture that shows high levels of liver functions and longevity. Furthermore, we showed that different mice strains show differential toxicity when treated with known liver toxins.

## 285 Wireless Method to Study the Gastrointestinal Track System of Dogs

KANAWEE WARRIT

Department: Clinical Sciences

A novel wireless method to study gastrointestinal track activity showed to be a suitable technique to be used in dogs for clinical diagnosis. However, the technique showed large variability and poor consistency between dogs. Similar to the results observed when using x-rays and barium impregnated spheres. The large variability observed in both techniques should be considered when using these techniques to measure GTI motility in dogs.

## 286 Hydrologic and Biogeochemical Flux Dynamics across an Active Beaver Meadow

PAM WEGENER

Department: Ecosystem Science and Sustainability

Beaver meadows are low gradient, multithreaded riparian wetland systems formed from multiple beaver dams. Over the past few centuries, land use practices and declining beaver populations have resulted in an extensive reduction in beaver meadows in North America and Europe, with consequences for catchment hydrology, morphology, and biogeochemistry. Here, we are evaluating the influence of an active beaver



meadow in the North Saint Vrain Watershed, CO on the timing and magnitude of water, sediment, and nutrient fluxes. Preliminary results suggest that the meadow has a moderating effect on streamflow and stores substantial amounts of organic matter during storm events.

## **287 Centron pH Validation for Use as a Carcass Antimicrobial Intervention**

**MAGGIE WEINROTH**

Department: Animal Sciences

This study was to validate the effectiveness of applying Centron™ as a beef carcass intervention against natural microflora. Centron was applied to carcasses at two pH levels, 1.30 and 1.05. Forty sides (n = 40) were treated with the high pH and 39 sides (n = 39) were treated with the low pH. Samples were taken before and after the cabinet. High pH Centron reduced aerobic plate counts ( $P < 0.0001$ ) from 2.00 log CFU/cm<sup>2</sup> to <0.96 log CFU/cm<sup>2</sup>. Low pH Centron treatment counts were reduced ( $P < 0.0001$ ) from 2.32 log CFU/cm<sup>2</sup> to 1.22 log CFU/cm<sup>2</sup>.

## **288 The Utilization of Web-based Resources for Computer Assisted Vocabulary Learning**

**JOHN WHALEN**

Department: English

Computer Assisted Language Learning (CALL) plays an important role in the field of teaching English as a second language. However, increasing specialization within the field means that CALL resources are sometimes perceived as accessible only to specialized researchers. This presentation will outline a recent migration of CALL technologies into accessible, web-based platforms and discuss how three CALL websites in particular, Vocab Sushi, Storybird, and ESLVideo.com, can be incorporated into an existing ESL classroom with minimal teacher training. An example syllabus will be modified for illustration, and the benefits to teachers and students will be discussed.

## **289 Predicting Individual Skeletal Muscle Behavior with Computational Modeling**

**BEN WHEATLEY**

Department: Mechanical Engineering

Neuromuscular ailments such as muscular dystrophy, Parkinson's disease, and aging cause a multitude of health problems for many people as a result of muscle weakness. While electromyography (EMG) and strength testing can provide insight into muscle function, there are no current clinical methods to evaluate individual muscle force, which is critical to determining degradation and disease. Intramuscular pressure (IMP) of the saturating fluid correlates with muscle force, yet the behavior of IMP is poorly understood. A validated computational model of individual skeletal muscle which predicts both muscle force and IMP can guide clinical applications to prevent and treat muscle weakness.

## **290 Modeling Biofouling with Norepinephrine and Adrenal Tissue on a Microchip**

**STACY WILLETT**

Department: Interdisciplinary - Bioengineering

The problem of "foreign bodies" in biology goes back to the earliest attempts at surgery and the use of materials to tie wounds together. In the case of electronic parts, bio-fouling is a process by which biological materials cause electronic parts to fail over time. A prior study (Feeny et al., 2014) using a similar microarray to detect nitric oxide (NO) released by (Z)-1-[N-(2-aminoethyl)-N-(2-ammonioethyl)amino]diazen-1-ium-1,2-diolate (DETA/NO) polymer found that short voltage pulses could successfully clean the surface of platinum electrodes from DETA. The current study explores whether similar voltage pulses may help clean norepinephrine from platinum electrodes in a microarray.

## **291 Molecular Detection of Feral Pigs using eDNA**

**KELLY WILLIAMS**

Department: Interdisciplinary - Ecology

Feral hogs have inhabited the U.S. since the late 1400's after being introduced to Florida as domesticated European pigs. Due to their opportunistic behavior, omnivorous feeding habits and high reproductive capacity, feral pigs have become a destructive invasive species throughout the United States. Due to concerns over the spread of disease and ecological damage caused by feral swine, there is a need for management. Developing methods for detecting the presence of feral swine DNA from environmental samples (eDNA) will provide a tool to assess effectiveness of management practices in addition to identifying locations that require management efforts.

## **292 Assessment of the Maternal Transmission of Chronic Wasting Disease**

**KASSI WILLINGHAM**

Department: Microbiology, Immunology and Pathology

Chronic wasting disease (CWD) is a prion disease characterized by its facile spread throughout cervid populations. Recently it's been recognized that transmission from mother to offspring may contribute to transmission of prions—an asymptomatic carrier phase, sometimes lasting decades, suggests that maternal transmission may have implications in prion spread. Placental trafficking and/or secretion in milk are two means by which maternal prion transmission may occur. We aim to explore CWD maternal transmission using a transgenic mouse expressing cervid prion protein. These studies will provide insight into the potential mechanisms and biological significance associated with mother to offspring transmission of prions.

## **293 Rancher Decision-Making: A Case Study in the Western Great Plains**

**HAILEY WILMER**

Department: Forest and Rangeland Stewardship

Ranchers in the semiarid, western Great Plains manage rangeland under highly variable climatic and economic conditions. Rancher decision-making processes and ranchers' perceptions of success have been excluded from conventional grazing experiments. Using a case study approach to examine the grazing decisions and outcomes of 17 ranching families in SE Wyoming and NE Colorado. We explored how ranch-



ers made grazing decisions, how ranchers defined successful outcomes, and the relationships between rancher decision-making processes, their definitions of success, and measured ecological outcomes. Grazing decisions are influenced by a complex combination of human dimensions and ranch characteristics, both of which vary among ranches.

## 294 Kenya's Water Crisis: Why Women are Critical

BECKY WITINOK-HUBER

Department: Human Dimensions of Nat Res

Women are culturally the main water resource users in Kenya and are historically underrepresented in decision-making. This research involves case studies from three different community based Water Resource User Associations' (WRUAs) in the Upper Ewaso Ngiro watershed in Laikipia, Kenya. Semi-structured interviews were carried out in three zones along Ngusishi, Pesi, and Burguret rivers with 170 residents and 19 WRUA leaders. Currently 57% of women are water group members, yet 94% expressed interest in participating in water decisions. This research provides insight into potential contributions of women to the success of conservation and development efforts in Laikipia, Kenya.

## 295 Mathematical Modeling of Skeletal Muscle Protein Synthesis Rates

CHRIS WOLFF

Department: Health and Exercise Science

Muscle protein synthesis is commonly assessed in response to various physiological stimuli, with measurements ranging from hours to weeks. Different experimental durations yield different protein synthesis values, likely because shorter experiments examine proteins with faster turnover higher cellular content. The purpose of this study was to use mathematical modeling and in vitro experimentation to determine the impact of individual protein synthetic rates and protein content on measured tissue synthetic rates. Our model confirmed independent effects of individual synthesis rates and protein content on measured synthesis rates and was confirmed with data from 285 individual proteins and the in vitro experiment.

## 296 Dispelling Domestic Violence Myths among Graduate Social Work Students

ARIEL WOOTAN MERKLING

Department: School of Social Work

Numerous studies have found that graduate social work students are not adequately prepared to provide appropriate services and interventions for victims of domestic violence. Social Work graduate programs find themselves under intense pressure to provide quality education covering many topics in a relatively short amount of time. As a result, schools do not always offer semester length classes on domestic violence. This study seeks to fill a gap in the literature by studying the experiential learning activity In Her Shoes that is often used for community education in the context of graduate social work classes.

## 297 Summer Melt and Underrepresented Students: Factors Affecting Matriculation

KERI WRIGHT

Department: School of Education

Summer Melt is a phenomenon in which first-generation high school students from socioeconomically disadvantaged backgrounds are failing to matriculate as a result of one or more factors that arise during the summer months. A review of the literature demonstrated the findings of several contributing factors that affect underrepresented student populations and their inability to start college following the summer months after high school graduation. In addition, the literature revealed methods being utilized or are emerging to aid in the increase of matriculation involving underrepresented students. Further research to aid student affairs professionals in the understanding of this phenomenon is recommended.

## 298 Tracking Beidou Signals during Ionosphere Scintillation on Ascension Island

DONGYANG XU

Department: Electrical and Computer Engineering

This poster presents real ionospheric scintillation observed on the BII signals of the Chinese BeiDou system, which has been an important member of the Global Navigation Satellite System, collected during a March 2013 experimental campaign on Ascension Island (S7.9°, W14.4°) and the software receiver signal processing algorithm developed to track BeiDou BII signals during strong scintillation. The results are compared with concurrent measurements obtained using a Septentrio PolaRxS receiver. Performance evaluations of the signal processing algorithm using different tracking parameters implemented in the software receiver will also be presented.

## 299 Wuschel System Biology and its Applications in Synthetic Biology

WENLONG XU

Department: Chemical and Biological Engineering

WUSCHEL (WUS) plays central roles in plant stem cell maintenance, which is necessary for plant growth and differentiation. Increasing complexity of WUS system makes it necessary for mathematical modeling to be involved. Here, we focus on influences of biologically realistic perturbations, like diffusion and cell growth and division, to WUS system behaviors. We observed the perturbations undermine or eliminate characteristic WUS system behaviors in our preliminary studies. We made further predictions on cooperativity of WUS expression given the current modelling scope. Our model is not only informative for our understandings on WUS system but also promising for Synthetic Biology applications.

### **300 Biodegradable Polyester with Nitric Oxide-Releasing Activity for Biomedical Applications**

**PAMELA YAPOR**

Department: Chemistry

Polyesters are currently utilized in a variety of medical applications that range from FDA-approved biodegradable medical implants such as sutures (e.g. VICRYL®) to the preparation of nanoparticles for drug delivery. Medical-grade biodegradable polyesters typically exhibit low toxicity and degrade into relatively harmless products under physiological conditions. Polyesters that incorporate citric acid as a component of their structure have been investigated for a variety of biomedical uses, including tissue engineering, medical device coatings, drug delivery, and wound healing applications. Nitric oxide is a bioactive molecule that can be incorporated to these materials in order to increase their applicability.

### **301 KPSS Test for Functional Time Series**

**GABRIEL YOUNG**

Department: Statistics

Econometric data often take the form of a collection of curves observed consecutively over time. Examples include, intraday price curves and treasury yield curves. A fundamental issue that must be addressed, before an attempt is made to statistically model or predict such series, is whether they contain a random walk component. This research extends the KPSS test to the setting of functional time series. We develop the form of the test statistic, and propose two testing procedures: Monte Carlo and asymptotic. The procedures are illustrated by an application to yield curves and a simulation study.

### **302 Impact of Shear Stress and Reverse Flow on Cardiac Morphogenesis**

**MOLLY ZELLER**

Department: Interdisciplinary - Cell and Molecular Biology

Missteps in formation of the embryonic heart can have drastic consequences, making cardiac malformations one of the most common human birth defects. Cardiac research is necessary to define the genes and molecular mechanisms responsible for malformations. The goal of our research is to investigate how altered shear stress on endocardial cells leads to genetic responses in the heart, and to define the genes responsible. We use zebrafish because the embryos develop outside of the mother, are transparent, and their hearts develop very similarly to other vertebrates including humans.

### **303 Toxic mRNA in a Cell Culture Model of Myotonic Dystrophy**

**ANNIE ZHANG**

Department: Interdisciplinary - Cell and Molecular Biology

Myotonic Dystrophy 1 is a multisystem inherited disease caused by expanded CUG repeats within the 3'UTR of the DMPK mRNA. These CUG repeat-containing RNAs are toxic to the cell and accumulate in nuclear foci where they sequester cellular RNA-binding proteins.

There're currently no treatments or cure for DM1, but one promising approach is to target the mutant DMPK mRNA for decay while leaving the wild type transcript intact. Therefore, a better understanding of these processes may lead us to additional therapeutics for DM1, as well as providing valuable information to explain how current pre-clinical therapies affect metabolism of DMPK mRNA.

### **304 Presentation Formats of Conflicting Scientific Evidence and Their Impacts**

**HUI ZHANG**

Department: Journalism and Technical Communication

This project examines presentation and reception of conflicting scientific evidence. First, I conceptualize two conflict presentation formats (within a document vs. across two documents) and one strategy (hedging) to cope with conflict. Second, I propose a mental model to explain how the two presentation formats differ in audience's comprehension and source credibility perception. Third, I use experimental data to assess presentation formats' effects on comprehension and credibility. I hypothesize that conflict across two documents enhances issue comprehension, but decreases source credibility. Fourth, I use the data also to assess hedging's effects on the aforementioned outcomes. Finally, I discuss implications.

### **305 Dynamic Assessment of Long-Span Cable-Supported Bridges Subjected to Multiple Hazards**

**YUFEN ZHOU**

Department: Civil and Environmental Engineering

As vital components of the transportation system, long-span cable-supported bridges are susceptible to multiple natural hazards and man-made hazards, such as strong wind, traffic, earthquake and cable loss incidents. A finite-element based nonlinear dynamic simulation platform is developed to incorporate the coupling bridge-wind, bridge-vehicle interactions and seismic excitations from bridge supports. The nonlinear dynamic simulation strategy is further established for cable breakage events based on the developed bridge-traffic-wind interaction model. A prototype long-span cable-stayed bridge is taken as an example for demonstration of the simulation analysis under multiple hazards using the developed platform.

### **306 Neuroethics, Moral Development and Media: An Emotional War over Reason**

**RHEMA ZLATEN**

Department: Journalism and Technical Communication

Neuroscience provides a unique perspective to the moral development process of media professionals and challenges prevalent theories of ethical decision making. Studies exploring impulse ethical responses in higher order reasoning offer new perspectives to understand how media professionals make ethical decisions. Several fields, from sociology to philosophy, have utilized this brain data to consider the mechanics of a full range of human behavior. There is a shortage of similar applications to the media theory. The viewpoint of neuroscience creates a theoretical challenge to the cognitive level theories currently driving media research, particularly concerning reasoning and moral development.

## **307 Demonstration of PBPK Model for Acetaminophen and its Key Metabolites**

**TODD ZURLINDEN**

Department: Chemical and Biological Engineering

Acetaminophen (APAP) is one of the most widely used analgesics in the world. Unfortunately, it is a well-known hepatotoxicant and is the principal cause of acute liver failure in the United States. To characterize the potential toxicity and pharmacological efficacy of APAP, it is important to be able to characterize and predict the disposition of this chemical in the body. To aid in this prediction, a physiologically-based pharmacokinetic model for APAP was developed. Here, we present the structure of this model and demonstrate that its predictions are in good agreement with a wide variety of experimental data from the literature.

Celebrating Research and Creativity  
At Colorado State University

## **GRADUATE STUDENT SHOWCASE**

February 25, 2015

Grand Ballroom, Lory Student Center

- |                        |   |
|------------------------|---|
| 10:30 a.m. – 1:30 p.m. | Poster Presentations, Artwork,<br>and Performances  |
| 1:30 p.m. – 4:00 p.m.  | Keynote Address and Break Out Discussions<br><i>“Expanding the Graduate Experience through<br/>Interdisciplinary and Innovative Approaches”</i> |
| 4:00 p.m. – 6:00 p.m.  | Awards Reception  |

**Presented by:**  
Graduate School  
and  
Office of the Vice President for Research