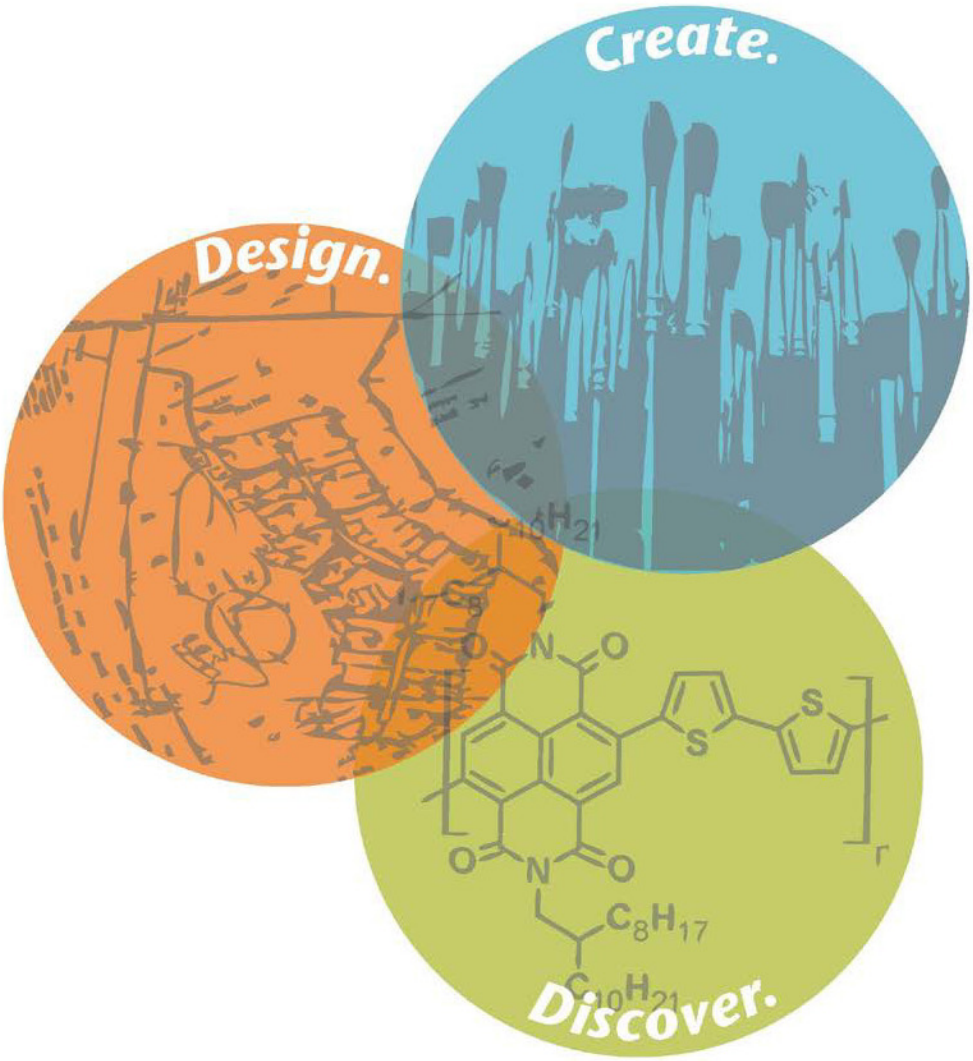
SURCA

SHOWCASE FOR UNDERGRADUATE RESEARCH AND CREATIVE ACTIVITIES



March 28, 2014

WASHINGTON STATE UNIVERSITY
UNIVERSITY COLLEGE

Showcase for Undergraduate Research and Creative Activities (SURCA) 2014

Table of Contents

Acknowledgements

SURCA 2014 would like to thank

The Boeing Company

and the

WSU Office of the Provost and Executive Vice President

for their generous support of the SURCA 2014 awards.

The SURCA Committee

Tolulope Adesope	Office of Undergraduate Education
Samantha Gizerian	College of Veterinary Medicine
Jeannie Holt	Office of Undergraduate Education
Kenzie Koehn	WSU Global Campus
Jeremy Lessmann	College of Arts and Sciences
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Showcase for Undergraduate Research and Creative Activities (SURCA) 2014

Friday, March 28, 2014
CUB M.G. Carey Senior Ballroom and CUB Junior Ballroom

SCHEDULE OF EVENTS

12:15 – 2:00 pm Oral Presentation Session I, Junior Ballroom — Public is welcome.

2:15 – 4:00 pm Oral Presentation Session 2, Junior Ballroom — Public is welcome.

2:30 – 3:15 pm Informal Judging, Senior Ballroom – Judges have access to review the posters without presenters present. There will be an area of the Sr. Ballroom open to Judges with refreshments available. No students or public during this period.

3:15 – 4:15 pm FORMAL JUDGING, Senior Ballroom – Student poster presenters will be available to answer questions. All score and comment sheets must be submitted by 4:15 p.m.

3:45 – 5:00 pm Senior Ballroom is open to the public for viewing of the posters. Refreshments will be served.

5:00 pm AWARDS PROGRAM, Junior Ballroom
Presentation of Awards

Showcase for Undergraduate Research and Creative Activities (SURCA) 2014

Friday, March 28, 2014
CUB M.G. Carey Senior Ballroom and CUB Junior Ballroom

AWARDS

SURCA 2014 awards available in each of eight categories:

Crimson Award	$300
Gray Award	$200
Novice Researcher*	$150
Early Career†	$150

*For students with two semesters of research involvement or fewer.
†For students with 60 credits or fewer (freshman and sophomores).

Additional Awards:

Louis Stokes Alliance for Minority Participation
WSU Emeritus Society

SURCA 2014 thanks our sponsors The Boeing Company and the WSU Office of the Provost and Executive Vice President for awards to top presenters at this year's showcase.

RUBRIC FOR WSU SHOWCASE FOR UNDERGRADUATE RESEARCH AND CREATIVE ACTIVITIES (SURCA) 2014

ELEMENT	EXCELLENT (4)	GOOD (3)	ACCEPTABLE (2)	POOR (1)	ABSENT (0)
Student Position *The perspective, thesis, hypothesis, idea, or claim which inspired the project.*	Specific position (perspective, thesis/hypothesis) is imaginative and analyzes the complexities of the position, synthesizes other points of view or disciplinary contexts, and demonstrates a clear understanding of the project limits.	Specific position (perspective, thesis/hypothesis) takes into account the complexities of the project, its underlying assumptions, and identifies other points of view.	Specific position (perspective, thesis/hypothesis) is present and addresses the context of the project.	Specific position (perspective, thesis/hypothesis) is present, but is simplistic and obvious.	Position is not present or is unclear.
Novel Contribution/ Innovative Thinking *Novelty or uniqueness of idea, claim, question, form, etc.*	Expands a novel or unique idea, question, format, product, or approach to generate new knowledge or creative works.	Creates a novel or unique idea, question, format, product, or approach.	Attempts to create a novel or unique idea, question, format, product, or approach.	Reformulates an idea or collection of available ideas or approaches.	Presents already established information.
Process/Method *Discipline-specific approach to addressing the idea, question, hypothesis, or claim.*	Skillfully manifests the relationship between process and end product and methods needed to accomplish the end product.	Understands the relationship between process and end product and methods needed to accomplish the end product.	Recognizes the relationship between process and end product and methods needed to accomplish the end product.	Misunderstands the relationship between process and end product and methods needed to accomplish the end product.	Lacks knowledge of the relationship between process and end product and methods needed to accomplish the end product.
Conclusion/Outcome/Creative Product *A synthesis of key discoveries drawn from evidence or the creative process. How results or creations apply to a larger context or the real world.*	Outcomes reveal insightful patterns, differences, or similarities related to focus. Assertions are well supported. Significance of what was discovered, learned or created is clear and implications are explored.	Outcomes reveal important patterns, differences, or similarities related to focus. Assertions are somewhat supported. Significance of what was discovered, learned, or created is clear.	Outcomes are presented, but the organization is not effective in revealing important patterns, differences, or similarities. Assertions lack adequate support. Significance of what was discovered, learned, or created is unclear.	Presents outcomes, but they are limited and/or are unrelated to focus. Assertions are incorrect or unwarranted. Significance of what was discovered, learned, or created is absent.	Project lacks outcomes, support for assertions, and significance of what was discovered, learned, or created.
Presentation/ Display *Visual presentation of project materials.*	Quality of presentation of materials gives the impression of consistency, professionalism and an astute attention to detail.	Attention to detail is generally good, but there are frequent minor errors or inconsistencies. There are no or very few large problems.	Attention to detail is generally good, but there are frequent minor errors or inconsistencies, and occasional large problems. Professionalism is not obvious.	Numerous small and large errors or inconsistencies in presentation. Details are present, but not sufficient for a professional product.	Presentation is crude, messy, unsophisticated, or very inconsistent.
Presenter *Oral presentation of the content of the project.*	Actively and effectively engages audience; communication indicates extensive knowledge of the project, is articulate and confident, and presents a mature professional demeanor.	Effectively engages with audience, communication indicates appropriate knowledge of the project, speaks clearly, and presents a professional demeanor.	Somewhat enthusiastic but struggles to communicate clearly. Communication indicates adequate knowledge of the project. Demeanor is appropriate.	Is minimally engaged and communicates ineffectively. Communication indicates limited knowledge about the project. Presents an unprofessional demeanor.	Is disinterested, non-communicative, insufficient knowledge base, unprofessional demeanor, or absent.

Showcase for Undergraduate Research and Creative Activities (SURCA) 2014
JUDGES

We wish to thank our Judges who have donated their time this afternoon. The judging pool is comprised of many volunteers from:

Acrosstown Traffic
Alturas Analytics, Inc.
Clearwater Paper Corporation
Decagon Devices, Inc.
Rocky Mountain Research Station, USDA
Strata Incorporated
SumTech Business Solutions, LLC
WSU College of Agricultural, Human, and Natural Resource Sciences
WSU College of Arts and Sciences
WSU College of Business
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WSU College of Engineering and Architecture
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WSU Extension
WSU Foundation
WSU Health and Wellness
WSU Honors College
WSU Institute for Shock Physics
WSU Libraries
WSU Office of Undergraduate Education
WSU Paul G. Allen School for Global Animal Health
WSU Postdoctoral Association
WSU School of the Environment
WSU University Communications

Showcase for Undergraduate Research and Creative Activities (SURCA) 2014 Entries
ALPHABETICALLY BY PRESENTER

Poster No.	Presenter/Mentor	Category	Title of Abstract
96	**Abarca, Jonathan** Mentor: Zhenqing Shi and James Harsh	Engineering and Physical Sciences	A New Generation of Fe-enhanced Compost for Soil Remediation
14	**Abujelala, Maher** Mentor: Matthew E. Taylor	Computer Science, Mathematics, Statistics, and Information Sciences	Quadcopter in Artificial Intelligence Research
46	**Adams, Erin** Mentor: Lav R Khot	Molecular, Cellular, and Chemical Biology	Studies on Multimeric Cell Penetrating Peptides
35	**Almaguer, Ashley** Mentor: Lav R Khot	Engineering and Physical Sciences	Nondestructive Rapid Sensing for Reducing Post-Harvest Potato Storage Losses
49	**Alvarez, Joel** Mentor: Kenneth Nash	Engineering and Physical Sciences	Nuclear Waste Reprocessing through Cyanex-923 and HEH[EHP] Solvent Extraction
13	**Anderson, Jayme** Mentor: Dr. Dana Baker	Social Sciences	Analysis of Organizations Best Practices for Recovering Post 9/11 Veterans and the Implications for Success
25	**Arndt, Andrew** Mentor: Dr. Cliff Berkman	Engineering and Physical Sciences	Synthetic Progress Towards an Inhibitor for Matrix Metalloproteinase-14
30	**Ascaso, Sophie** Mentor: Kwan Hee Kim	Molecular, Cellular, and Chemical Biology	Retinoic Acid Receptor Alpha is Critical in the Differentiation of Male Germ Cells
118	**Badger, Janelle** Mentor: Dr. David Crowder	Organismal, Population, Ecological, and Evolutionary Biology	The Effect of Previous Herbivory and Virus on Aphid Fitness

Poster No.	Presenter/Mentor	Category	Title of Abstract
59	**Bagdon, Powell** Mentor: Ming Xian	Engineering and Physical Sciences	Preparation and analysis of New Hydrogen Sulfide Donors
127	**Baird, Dane, Bettina Ernst, Chris Routen, Austin Carter** Mentor: Howard Davis	Engineering and Physical Sciences	Mobile Foam
57	**Ballsmider, Lindsay** Mentor: Dr. Krzysztof Czaja	Organismal, Population, Ecological, and Evolutionary Biology	Vertical Gastric Sleeve Surgery in Lean Rats Implicates Plastic Changes in Feeding Centers of the Hindbrain while Effects of Fat Accumulation may play a Smaller Role
149	**Behrend, Philip** Mentor: David Crowder	Organismal, Population, Ecological, and Evolutionary Biology	A Meta-Analysis of Factors Contributing to the Dilution Effect in Vector-Borne Disease
116	**Bellinger, Brian and Cuevas, Cecilia** Mentor: Daniel Z. Skinner	Molecular, Cellular, and Chemical Biology	Disruption of Non-Classical Progesterone Signaling in the Uterus Leads to Progression toward Endometrial Cancer
27	**Berg, Brianna** Mentor: Dr. Jonel Saludes	Molecular, Cellular, and Chemical Biology	The Isolated Transmembrane Domain of Prostate Specific Membrane Antigen is Capable of Oligomerization
210	**Bolar, Jasmyn** Mentor: John Kalu Osiri	Social Sciences	Investigating the Optimal Choice Load for Online Stores
138	**Bone, Kendra** Mentor: Kathleen Ryan, Bob Krikac	Arts and Design	Historic Walking Tour in Colfax, Washington: A Link to Eastern Washington's Past
141	**Borges, Anne** Mentor: Kathleen Ryan	Arts and Design	A Library for the Future
130	**Brown, Melissa** Mentor: Drew Betz	Social Sciences	The Impact of Social Media on 4-H in Washington State
207	**Castillo, Diane** Mentor: John K. Osiri	Social Sciences	Relationship Between Global Mindedness and the intentions to Start a Business

Poster No.	Presenter/Mentor	Category	Title of Abstract
107	**Cervenka, Anne** Mentor: Dr. Rebecca Craft	Organismal, Population, Ecological, and Evolutionary Biology	Sex Differences in the Rewarding and Antinociceptive Effects of Morphine Using Conditioned Place Preference Procedure
66	**Chalmers, Colleen** Mentor: Dr. Brittany Rhoades-Cooper	Social Sciences	Learning at Home: Demographic Differences in the Home Learning Environment which Influence Kindergarten Academic Achievement
41	**Chan, Michelle** Mentor: Jim Pru	Molecular, Cellular, and Chemical Biology	The Role of Transcription Factors HEB and E2A in Female Reproductive Tract Development and Postnatal Function
108	**Chandra, Vikram** Mentor: Dr. Murali Chandra	Molecular, Cellular, and Chemical Biology	Cardiomyopathy Mutation, F72L, in Rat Cardiac Troponin T Attenuates both the Ca2+ Sensitivity and the Magnitude of the Length-Mediated Cardiac Muscle Activation
135	**Christiansen, Ky** Mentor: Kathleen Ryan and Phil Gruen	Arts and Design	Design Perspectives of Shared vs. Displayed Culture
54	**Church, Joel** Mentor: Dr. Raymond Quock	Molecular, Cellular, and Chemical Biology	The Involvement of Supra Spinal and Spinal Adrenergic Pathway in Hyperbaric Oxygen (HBO2)-Induced Antinociceptive Effect
53	**Cieslak, Brian** Mentor: Dr. Steven D. Kale	Molecular, Cellular, and Chemical Biology	In the Name of the State: Bonapartism and the Foreign Policy of the Second French Empire
113	**Clark, Nicole** Mentor: James Pru	Molecular, Cellular, and Chemical Biology	I Disruption of Non-Classical Progesterone Signaling in the Uterus Leads to Progression toward Endometrial Cancer
116	**Cuevas, Cecilia and Bellinger, Brian** Mentor: Daniel Z. Skinner	Molecular, Cellular, and Chemical Biology	Disruption of Non-Classical Progesterone Signaling in the Uterus Leads to Progression toward Endometrial Cancer
11	**Cundy III, D.J.** Mentor: Natalia Moroz	Molecular, Cellular, and Chemical Biology	Hunting for the Tropomodulin Binding Partner

Poster No.	Presenter/Mentor	Category	Title of Abstract
79	**De la Cruz, Gabriel** Mentor: Dr. Shira Broschat	Computer Science, Mathematics, Statistics, and Informational Sciences	I A Rapid Algorithm for Detecting Antibiotic Resistance Gene Sequences from Next-Gen Sequencing Data
34	**Delgado, Vanessa** Mentor: Dr. Linda Heidenreich	Social Sciences	Domestic Violence Resources for Latino/a communities: Resource assessment of domestic violence agencies in Washington State
22	**Delgado, Vanessa** Mentor: Dr. Julie Kmec	Social Sciences	Who Gets the Money? Non-Ethnic vs. Multi-Ethnic Organization Affiliation Influence on Undergraduate Scholarship Recipients
143	**Denny, Adam** Mentor: John F. Barber	Arts and Design	AudioBash
91	**Dittmer, Andrea** Mentor: Dr. Giuliana Noratto	Applied Sciences	Whole Wheat prevent Obesity and Cardiovascular Disease Risk in Obese Diabetic db/db Mice
209	**Donwerth, Haley and Kungu, Kenneth** Mentor: Dr. John Kalu Osiri	Social Sciences	Exploring Gender Differences in Global Mindedness Relative to Entrepreneurial Intentions
208	**Ekberg, Erik** Mentor: John Kalu Osiri	Social Sciences	Relationship between Global Mindedness and Preference for Employment
48	**Ekoue-totou, Kangni and Milewski, Holly** Mentor: Dr. W. James Cooper	Organismal, Population, Ecological, and Evolutionary Biology	Fish skull Biomechanics and Developmental Changes in Form, Function and Ecology.
119	**Elhart, Lindsey and Finkel, David** Mentor: Howard Davis	Engineering and Physical Sciences	Improved Aircraft Safety with an Airfoil Airspeed Sensor
51	**Ellesmere-Jones, Caity** Mentor: Luke Premo	Social Sciences	The Role of Gossip in Human Cooperation on a College Campus

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28	**Ellis, Graham** Mentor: Dr. Michael Pumphrey	Applied Sciences	Screening for Durable Rust Resistance in Global Wheat Accessions
127	**Ernst, Bettina; Routen, Chris; Baird, Dane; Carter, Austin** Mentor: Howard Davis	Engineering and Physical Sciences	Mobile Foam
61	**Falce, Joshua** Mentor: Lydia Gerber	Social Sciences	In Defense of Democracy: Pursuing the Image of a Free and Democratic Taiwan in Politics and Media in the 20th Century
119	**Finkel, David and Elhart, Lindsey** Mentor: Howard Davis	Engineering and Physical Sciences	Improving Aircraft Safety with an Airfoil Airspeed Sensor
85	**Folger, Michelle** Mentor: Dr. Dana Lee Baker	Social Sciences	Enhancing Neurodiversity at WSUV
203	**Freese, Zoe** Mentor: Theresa Jordan	Humanities	The Historical Analysis of Medieval Textiles and Tapestries
64	**Friend, Mitchell** Mentor: Nathalie Wall	Engineering and Physical Sciences	Oxidation of 99-Tc(IV) to Tc(VII) in Presence of Humic Acids
76	**Gavin, Patrick** Mentor: Jacob Leachman	Engineering and Physical Sciences	Passive PEM Fuel Cell-Battery Hybrid Power System for UAS
65	**Gefre, Josh** Mentor: Dr. Kevin Murphy	Organismal, Population, Ecological, and Evolutionary Biology	Breeding Amaranth
139	**Giron, Uris** Mentor: Kathleen Ryan	Arts and Design	The Science of Sustainability: Developing Hands-On Exhibits On Heat Transfer
140	**Giron, Uris** Mentor: Kathleen Ryan	Arts and Design	White Spring Ranch
62	**Grandi, Fiorella** Mentor: Wenfeng An	Arts and Design	Investigating Methylation Marks on Retrotransposed Sequences in Mouse Tissues

Poster No.	Presenter/Mentor	Category	Title of Abstract
106	**Graves, Laurel** Mentor: Shelley Pressley	Engineering and Physical Sciences	Variations in Energy, CO2, and Water Transport and Storage of Burned and Unburned Agricultural Fields in the Pacific Northwest
81	**Gray, Jake** Mentor: Su Ha	Engineering and Physical Sciences	Alteration of the Kinetics of Methane Reformation by Application of an Electrical Field Across a Sintered Nickel Catalyst
137	**Haffner, Keli** Mentor: Kathleen Ryan	Arts and Design	Consolidation of the Unrecognized | From Abyss to Radiance
5	**Hawkinson, Jessica** Mentor: Alla Kostyukova	Molecular, Cellular, and Chemical Biology	The Potential Role of Deamidation of Asparagine 155 within Neural Tropomodulin2
117	**Heinzmann, Meredith** Mentor: Dr. Ryan M. Hare	Humanities	The Wolf Princess: Analyzing Hayao Miyazak's Princess Mononoke
15	**Henderson, Bryce** Mentor: Hector Aguilar	Molecular, Cellular, and Chemical Biology	Elucidating the Fusogenic Efficacy of Nipah Virus Fusion Proteins and Mutant Derivatives
2	**Henson, Zoey** Mentor: M. Grant Norton	Engineering and Physical Sciences	Molybdenum Dioxide as a Novel Material for Fuel Oxidation
24	**Hewitt, Kelly** Mentor: Dr. Rebecca Hewitt	Organismal, Population, Ecological, and Evolutionary Biology	Sex Does Not Influence the Effectiveness of Anti-Inflammatory Drugs at Reducing Pain
92	**Hoff, Gunnar** Mentor: Professor Su Ha	Engineering and Physical Sciences	Fabrication of Unmediated, Compressed Bioanodes to Utilize the Oxidation of Glucose Towards the Creation of an Enzymatic Biofuel Cell
204	**Holbrook, Amy** Mentor: Dennis Reynolds	Social Sciences	What Effect Does Wine Closure Type Have on Perceptions of Wine's Appearance, Bouquet, Taste, and Overall Quality? An Empirical Investigation
38	**Hsu, Chen Jen** Mentor: Jonel Saludes	Applied Sciences	Synthetic Studies of New Ligands for "Click" Chemistry

Poster No.	Presenter/Mentor	Category	Title of Abstract
97	**Hughes, Ellis; Small, Victor; Monda, Steven** Mentor: Anita Vasavada	Engineering and Physical Sciences	Accounting for Subject Size and Posture Affects the Predictions of Biomechanical Models
98	**Hutzenbiler, Brandon** Mentor: Erica Crespi	Organismal, Population, Ecological, and Evolutionary Biology	Developmental Effects of Roadside Proximity in Reproductive Morphology of Juvenile Lithobates Sylvaticus
86	**Hyder, Jack** Mentor: Jonel Saludes	Molecular, Cellular, and Chemical Biology	Exosome Detection Using a Modified Synaptotagmin-1 Derived Peptide
58	**Jackson, Danielle** Mentor: Laura Lavine	Molecular, Cellular, and Chemical Biology	Valid reference gene selection for quantitative real-time PCR analysis in *Tetranychus urticae* Koch (Arachnida: Acari: Tetranychidae)
125	**Johnson, Ashley** Mentor: Dr. Doug Walsh and Dr. Laura Lavine	Organismal, Population, Ecological, and Evolutionary Biology	Identification of Immature and Adult Stages of Leafhoppers in Vineyards with DNA Barcodes
201	**Johnson, Alyssa** Mentor: Theresa Jordan	Humanities	The Arthurian Legend during the Middle Ages
84	**Joner, Benjamin** Mentor: Dr. John Bishop	Organismal, Population, Ecological, and Evolutionary Biology	Plant Response to Herbivory by Malacosoma Californicum Pluviale and Cryptorhynchus Lapathi at Mount St. Helens Volcano
132	**Jones, Mychael; Wouden, Brittany; Palermini, Stephen; Morrelli, Angela** Mentor: John Barber	Arts and Design	Pop Up Gallery: Jobs That Don't Exist Yet: Testing the use of Augmented Reality as a means of Education in a K-12 Environment.
17	**Joyce, Patrick and Klein, Evan** Mentor: Dr. John F. Alderete	Organismal, Population, Ecological, and Evolutionary Biology	Comparative Study of Novel Recombinant Proteins Detected by Human Antibody to Trichomonas vaginalis
205	**Kassebaum, Emily** Mentor: Lydia Gerber	Social Sciences	Americans Adopting from China: Adoption Experience and the Perception of China

Poster No.	Presenter/Mentor	Category	Title of Abstract
23	**Kelly, Shawna** Mentor: Kathleen Ryan	Arts and Sciences	Understanding Rural Communities and Personal Values
121	**Kiamco, Mia Mae** Mentor: Haluk Beyenal	Molecular, Cellular, and Chemical Biology	How Biofilm Inhibitors Affect Biofilm Structure
21	**Kidder, Lance** Mentor: Kristen Johnson and Holly Neibergs	Molecular, Cellular, and Chemical Biology	Gene Set Enrichment Analysis of Residual Feed Intake in Hereford Cattle
67	**Killinger, Bryan** Mentor: Dr. Alla Kostyukova	Molecular, Cellular, and Chemical Biology	Binding Site and Regulation Mechanism of Bacterial Flagellum Polymerization through the Binding of FlgM and FliS
17	**Klein, Evan and Joyce, Patrick** Mentor: Dr. John Alderete	Organismal, Population, Ecological, and Evolutionary Biology	Comparative Study of Novel Recombinant Proteins Detected by Human Antibody to Trichomonas vaginalis
109	**Kuhn, John** Mentor: Dr. Arron Carter	Applied Sciences	Effect of the Gpc-B1 Allele On Grain Protein Concentration in Hard Red Winter Wheat (Triticum aestivum L.) in the Pacific Northwest of the US
93	**Lakey, Kelsi and Nygaard, Marcia** Mentor: Dr. Pat Carter	Organismal, Population, Ecological, and Evolutionary Biology	Effect of Temperature on Trout Body Shape
120	**Lape, Katelin** Mentor: Patrick Ellsworth	Applied Sciences	A Look into Setaria and its Water Use Efficiency Under Stress.
94	**Lawhead, Joseph** Mentor: Kwan Hee Kim	Molecular, Cellular, and Chemical Biology	Exposure of DEHP to Gestating Mouse Dams affects Mitosis and Meiosis of Male Germ Cells in the F3 Generation Progeny
19	**Leonard, Brandon** Mentor: Dr. Dana Baker	Social Sciences	What is the Age of Majority?
37	**Mand, Alison and Rausch, Sarah** Mentor: Pamela Lee	Humanities	Deliberate Destruction of Art and Culture: Iconoclasm in Afghanistan

Poster No.	Presenter/Mentor	Category	Title of Abstract
133	**Martensen, Brianna** Mentor: Kathleen Ryan	Arts and Design	Design and Proto-typing for this generation
26	**Martin, Joelle and Nusbaum, Amy** Mentor: Paul Whitney and John Hinson	Social Sciences	The Role of Outcome Expectancies in a Reversal Learning Task
70	**Mattson, Alexander** Mentor: Konstantin Matveev	Engineering and Physical Sciences	Design and Testing of a Remotely Controlled Air-Cavity Boat
114	**McCrory, Miranda** Mentor: Kathleen Ryan	Arts and Design	Views through a Void: Light and Connection to Place
69	**Mejia, Celia** Mentor: Dr. Cramen R. Lugo-Lugo	Social Sciences	Influence of Parents in Higher Education Attainment: The Case of Latino Students from the Wenatchee and Yakima Valleys
6	**Mejia, Juan** Mentor: Dr. Robert Olsen	Engineering and Physical Sciences	The Impact of Orthopedic Implants on Electromagnetic Field Exposure Safety Standards
48	**Milewski, Holly** Mentor: Dr. W. James Cooper	Organismal, Population, Ecological, and Evolutionary Biology	Fish Skull Biomechanics and Developmental Changes in Form, Function and Ecology.
206	**Miller, Kari** Mentor: Julie Kmec	Social Sciences	Exposure, Interactions, and Open-Mindedness: the Road to Acceptance and Understanding through International Experiences
36	**Mobley, Daniel** Mentor: Dr. Douglas Call	Molecular, Cellular, and Chemical Biology	Bacteria Conjugation Efficiency in the Presence of sub-Minimal Inhibitory Concentration Levels of Ceftiofur or Florfenicol in a Soil-Water Environment
97	**Monda, Steven; Hughes, Ellis; Small, Victor** Mentor: Anita Vasavada	Engineering and Physical Sciences	Accounting for Subject Size and Posture affects the Predictions of Biomechanical Models

Poster No.	Presenter/Mentor	Category	Title of Abstract
83	**Monda, Steven** Mentor: Anita Vasavada	Engineering and Physical Sciences	A Mathematical Model to Identify Mechanisms of HSV-2 Containment in Mice
132	**Morrelli, Angela; Wouden, Brittany; Palermini, Stephen; Jones, Mychael** Mentor: John Barber	Arts and Design	Pop Up Gallery: Jobs That Don't Exist Yet: Testing the use of Augmented Reality as a means of Education in a K-12 Environment.
52	**Moss, Kelsey** Mentor: Holly Neibergs	Molecular, Cellular, and Chemical Biology	Polymelia in Holstein Cattle
105	**Ndambiri, Wanjiru** Mentor: Kathleen Ryan	Arts and Design	Fabricating a Community
142	**Nelson, Alicia** Mentor: Kathleen Ryan	Arts and Design	Behind the Framework
73	**Nelson, Natalie** Mentor: Dr. James Pru	Molecular, Cellular, and Chemical Biology	Stromal Derived Factor-1 Gene and its Role in Early Mammalian Pregnancy
148	**Nguyen, Thanh-Thuy (Dinah)** Mentor: susan Finley	Humanities	Underserved Asian American and Pacific Islander Student Success Strategies: Case Study on At Home At School Program
126	**Nicoara, Daniel** Mentor: Dr. Raymond Quock	Molecular, Cellular, and Chemical Biology	Hyperbaric Oxygen (HBO2) Treatment Suppresses the Withdrawal Symptoms in Opioid Dependent Mice.
71	**Nilson, Ashley** Mentor: Joseph Harding	Organismal, Population, Ecological, and Evolutionary Biology	Motor and Dopamine Neuron Recovery in a 6-OHDA Parkinson's Disease Model using Oral Treatments of a Small Molecule Hepatocyte Growth Factor Agonist
88	**Nishomura, K. O.** Mentor: Kathleen Ryan	Arts and Design	Visualization
7	**Novik, Yelena; Pedersen, Samantha; Tello, Nemer; Schweiter, Hannah** Mentor: Andy Cavagnetto	Social Sciences	The Correlation Between Teaching Style and Student Comprehension

Poster No.	Presenter/Mentor	Category	Title of Abstract
26	**Nusbaum, Amy and Martin, Joelle** Mentor: Dr. Paul Whitney	Social Sciences	The Role of Outcome Expectancies in Reversal Learning Performance
93	**Nygaard, Marcia and Lakey, Kelsi** Mentor: Pat Carter	Organismal, Population, Ecological, and Evolutionary Biology	Effect of Temperature on Trout Body Shape
55	**Olsen, Joseph** Mentor: Wen-Ji Dong	Engineering and Physical Sciences	Increasing the Power Output of the Cdte Solar Cell via a Novel Luminescent Down-Shifting Molecule: Synthesis, Photophysical Studies and Application
33	**O'Malley, Delaney** Mentor: William B. Davis	Molecular, Cellular, and Chemical Biology	The Isolation and Characterization of Nineteen Novel Mycobacteriophages at WSU
39	**Pack, Jarrod** Mentor: Dr. Naidu Rayapati	Organismal, Population, Ecological, and Evolutionary Biology	Studies on Grapevine Red Blotch Disease in Washington Vineyards
132	**Palermini, Stephen; Wouden, Brittany; Morelli, Angela; Jones, Mychael** Mentor: John Barber	Arts and Design	Pop Up Gallery: Jobs That Don't Exist Yet: Testing the use of Augmented Reality as a means of Education in a K-12 Environment.
32	**Parks, Audrey** Mentor: Erica Crespi	Organismal, Population, Ecological, and Evolutionary Biology	The Importance of Nutrition on Regeneration Before and After Injury
7	**Pedersen, Samantha; Tello, Nemer; Schweiter, Hannah; Novik, Yelena** Mentor: Andy Cavagnetto	Social Sciences	The Correlation between Teaching Style and Student Comprehension

Poster No.	Presenter/Mentor	Category	Title of Abstract
77	**Perales, Annette** Mentor: Dr. Matthew Bumpus	Social Sciences	Mother - Student Communication and College Adjustment
40	**Perales, Jeanette** Mentor: Olusola Adesope	Social Sciences	Foster Youth in College and Associative Factors of College Success
12	**Perez, Eli** Mentor: R. Charles Weller	Humanities	Conflict, Conversion, or Co-Existence? Islamic and Western Relations
131	**Perry, Nicholaus** Mentor: Dr. Jacob Leachman	Engineering and Physical Sciences	Variable Pitch Propeller for Small Scale Unnamed Arial Vehicles.
47	**Prager, Lindsay** Mentor: Dr. Dana Lee Baker	Social Sciences	Enhancing Neurodiversity at WSUV
150	**Pruett, Matthew** Mentor: Mike Jackson	Engineering and Physical Sciences	The Discovery of Far-Infrared Laser Emissions from Optically Pumped CH318OH
87	**Raine, Hanna** Mentor: Dr. Jacob Leachman	Engineering and Physical Sciences	Determining the Mass Flow Rate of Solid Argon
103	**Rath, Justin and Werner, Brandan** Mentor: Liv Haselbach	Engineering and Physical Sciences	Pervious Concrete -- New MFD Design
37	**Rausch, Sarah** Mentor: Pamela Lee	Humanities	Deliberate Destruction of Art and Culture: Iconoclasm in Afghanistan
82	**Reinelt, Michele** Mentor: James Pru	Molecular, Cellular, and Chemical Biology	E2A and HEB are Indispensable Transcriptional Regulators of Pituitary and Uterine Physiology
60	**Rivera, Nicholas** Mentor: Dojin Ryu	Applied Sciences	Occurrence of Mycotoxins in Light Vs. Dark Peanut Kernels
56	**Robinson, Kendall** Mentor: Sandra Brown	Social Sciences	Bookmarks to Encourage a Healthy Breakfast

Poster No.	Presenter/Mentor	Category	Title of Abstract
202	**Rodriguez, Marcela** Mentor: Dr. Victor Villanueva	Humanities	The Marked Narrative: A Rhetorical Analysis of Immigrant Narratives and their Sociopolitical Implications
75	**Rose, Vanessa** Mentor: Steve Bollens and Gretchen Rollwagen-Bollens	and Evolutionary Biology	The Interactive Effects of Phosphorus and Planktonic Grazers on Harmful Algal Blooms in Vancouver Lake, Washington
127	**Routen, Chris; Ernst, Bettina; Baird, Dane; Carter, Austin** Mentor: Howard Davis	Engineering and Physical Sciences	Mobile Foam
101	**Ryckman, Mia** Mentor: Normal Lewis	Molecular, Cellular, and Chemical Biology	Discovering the Genetics of (-)-Pinoresinol in Flax Seeds
90	**Sandberg, Hilary** Mentor: Dr. Lydia Gerber	Humanities	Opium in Protestant Missionary Communications: A Study of Protestant Missionary Communications on the Opium Issue to their Western Audiences, 1817-1907
9	**Sawyer, Emily** Mentor: Lane Brown	Molecular, Cellular, and Chemical Biology	The Effect of CNO on Rat Happiness
1	**Schneider, Seth** Mentor: William B. Davis	Molecular, Cellular, and Chemical Biology	A Bioinformatic Analysis of the Genome of Mycobacteriophage Sillygoose
104	**Schumacker, Alexander** Mentor: Rebecca Holcomb	Molecular, Cellular, and Chemical Biology	Invasive Phragmites australis
7	**Schweiter, Hannah; Pedersen, Samantha; Tello, Nemer; Novik, Yelena** Mentor: Andy Cavagnetto	Social Sciences	The Correlation between Teaching Style and Student Comprehension
18	**Sexton, Thomas** Mentor: Asaph Cousins	Molecular, Cellular, and Chemical Biology	The in vivo Temperature Response of Rubisco Kinetics in Oryza sativa.

Poster No.	Presenter/Mentor	Category	Title of Abstract
102	**Shimono, Misa** Mentor: Dee Posey	Social Sciences	The Benefits of a Growth Mindset on Statistics Anxiety and Statistics Self-Efficacy
124	**Shoemake, Elijah** Mentor: Dr. Jacob Leachman	Engineering and Physical Sciences	Design and Testing of an Orientation - Independent Superconducting Fuel Level Gauge
100	**Silva, Karina** Mentor: Dr. Thomas Power	Social Sciences	Latina Mothers Influences on their Children's Self-Regulation of Energy Intake
45	**Slocumb, Winston** Mentor: Dr. Paul Benny	Engineering and Physical Sciences	Versatile Bifunctional Chelates for Generating Targeted [99mtc(CO)3]+ Radiopharmaceuticals
97	**Small, Victor; Hughes, Ellis** Mentor: Dr. Anita Vasavada	Engineering and Physical Sciences	Accounting for Subject Size and Posture Affects the Predictions of Biomechanical Models
20	**Smith, Abigail** Mentor: Bernard Vanwie	Engineering and Physical Sciences	Mechanical Analysis of Cartilage Tissue Grown with Biochemical and Mechanical Stimuli in a Continuous Centrifugal Bioreactor
122	**Soto, Francisco** Mentor: Dr. Bin Yang	Engineering and Physical Sciences	Optimization of Bioconversion of Lignin with Oleaginous Rhodococus DSM1069 and PD630
123	**Stumpo, Gordon** Mentor: Patricia Fischer	Arts and Design	Fashion as Identity: How Clothing Reflects Life Events
44	**Sybouts, Kelsey** Mentor: Kathleen Ryan	Arts and Design	Interdisciplinary and Collaborative Work: How to Work more Efficiently for Better Project Outcomes
111	**Taylor, Michelle** Mentor: Dr. Courtney L. Meehan	Social Sciences	Multiple Attachments amongst the Ngandu of the CAR

Poster No.	Presenter/Mentor	Category	Title of Abstract
7	**Tello, Nemer; Novik, Yelena; Pedersen, Samantha; Schweiter, Hannah** Mentor: Andy Cavagnetto, PhD	Social Sciences	The Correlation Between Teaching Style and Student Comprehension
50	**Thomas, Edward** Mentor: Dr. Timothy C. Paulitz	Organismal, Population, Ecological, and Evolutionary Biology	Root rot of pea caused by Rhizoctonia solani anastomosis group (AG)-8: Yield loss and screening for resistance
4	**Thomson, Amanda** Mentor: Dr. Julie Kmec	Social Sciences	The Effect of Perceived Sexual Orientation on Workplace Evaluation
99	**Tran, Vi** Mentor: Dr. Haluk Beyenal	Engineering and Physical Sciences	Electron Transfer Mediator Increases Production Of 1,3-Propanediol in Bioelectrochemical Reactors
128	**Traverso, Joseph** Mentor: Dr. Nikolaos Voulgarakis	Computer Science, Mathematics, Statistics, and Information Sciences	The Effect of External Radiation on DNA-Enzyme Complexes
63	**Upton, Tamara** Mentor: Kathleen Ryan	Arts and Design	Bringing the One-Room Valley Schoolhouse Back to Life
72	**Vacca, Amalia** Mentor: Dr. Dene Grigar	Arts and Design	Interface Design and Usability Testing for iSci: Interactive Technologies for Science Immersion
129	**Van Cleave, Katie** Mentor: Sue Ritter	Molecular, Cellular, and Chemical Biology	Interaction of G protein Coupled Receptor 40 (GPR40) and Î²-Mercaptoacetate reveals a Mechanism for Control of Appetite by Dietary Fatty Acids.
134	**Vannice, Lucas** Mentor: Dr. Rick Knowles, Caroline Pearson-Mims	Arts and Design	Cultivating a Grass Garden through Texture, Color, and Form

Poster No.	Presenter/Mentor	Category	Title of Abstract
8	**Viloria, Kelsie** Mentor: Patrick Carter	Organismal, Population, Ecological, and Evolutionary Biology	A Review of Immunocontraception Methods as a means of Elephant Population Control
89	**Volz, James** Mentor: Dr. Douglas Call	Molecular, Cellular, and Chemical Biology	Analysis of Non-Randomly Distributed SNPs in floR
29	**Wakeling, Molly** Mentor: Dr. Jason T. Burke (Lawrence Livermore National Laboratory), Dr. Steven Tomsovic (WSU)	Engineering and Physical Sciences	Charge States of Th-229m: Path to Finding the Half-Life
80	**Warto, Lillian** Mentor: David Crowder	Organismal, Population, Ecological, and Evolutionary Biology	Agricultural Intensification
110	**Washburn, Stephanie** Mentor: Dr. Steve Martinez	Organismal, Population, Ecological, and Evolutionary Biology	Characterization of a Noninvasive Lameness Model in Dogs
43	**Wedam, Kristem** Mentor: Dr. Jeb P. Owen	Organismal, Population, Ecological, and Evolutionary Biology	Testing Biotic Factors Effects on Northern House Mosquito Fitness
103	**Werner, Brandan and Rath, Justin** Mentor: Liv Haselbach	Engineering and Physical Sciences	Pervious Concrete -- New MFD Design
3	**Wilen, Adrienne** Mentor: Kirstin Malm	Applied Sciences	Inhibition of Propionibacterium acnes by Essential Oils
211	**Wimberly, Shanee** Mentor: Dr. John Kalu Osiri	Social Sciences	Relationship between Leadership and Resiliency and the Moderating Effect of Proactive Personality: Implications on Disadvantaged Populations

Poster No.	Presenter/Mentor	Category	Title of Abstract
132	**Wouden, Brittany; Morelli, Angela; Palermin, Stephen** Mentor: John Barber	Arts and Sciences	Pop Up Gallery: Jobs That Don't Exist Yet: Testing the use of Augmented Reality as a means of Education in a K-12 Environment.
78	**Wulf, Alexander** Mentor: Margaret E. Black	Molecular, Cellular, and Chemical Biology	Exploiting a Yeast Surface Display System for the Identification of Novel Malarial Inhibitors

Presentation Number 1

Abstract Title:	**A Bioinformatic Analysis of the Genome of Mycobacteriophage Sillygoose**		
Presenter:	Seth Schneider		
Mentor:	William B. Davis		**Honors:** No
Co-Authors:	Matthew Aultman, Kirsten Banacky, McKenzie Corpron, Landra Evans, Joseph Bendawald, Nicole Mahan, Thomas Minkiewitz, Delaney O'Malley, Lora Prosser, Juan Ramirez, Jeremy Rice, Jeanette Russell, AJ Schumacher, Breanne Short, Autumn Tendler, Taylor Thibodea		
Presentation Type:	Poster	**College:** College of Veterinary Medicine	**Major:** Genetics and Cell Biology
Category:	Molecular, Cellular, and Chemical Biology		

ABSTRACT:

Antibiotics and other chemicals are the methods usually used to control the growth of bacteria. However, there is a lesser known, and possibly better, method that utilizes the viruses that infect bacteria and kills them through lysis. These viruses, known as bacteriophages, are so prevalent on Earth that the chance of discovering a new one is extremely likely. This is what twenty students, accurately called Phagehunters, did in the laboratory during Fall 2013: they captured, isolated and purified previously undiscovered bacteriophages that infect *Mycobacterium smegmatis*. In Spring 2014, nineteen students, a mixture of last semester's Phagehunters and new ones, are using bioinformatic tools to analyze the genome of a phage called Sillygoose to discover the genes that are located in this phage. Once annotation is complete, the Phagehunters will use comparative genomics to discover the relationship between Sillygoose and the over 600 previously discovered mycobacteriophages from across the world. This work is expected to contribute to our overall understanding of bacteriophage dynamics: how they infect bacteria, which species of bacteria they can infect, how they lyse their host bacteria, and whether or not they rupture the bacteria immediately after infection (lytic phage) or forcibly insert their DNA into the bacteria's DNA in order to survive in a dormant state (lysogenic phage). The answers to these questions and more are made possible by WSU Phagehunters research and may lead to the development of therapies that use phages to infect bacteria that cause harmful diseases such as tuberculosis and leprosy and may also lead to the use of newly discovered, beneficial genes from phage DNA in the medical and biological fields.

Abstract Title:	**Molybdenum Dioxide as a Novel Material for Fuel Oxidation**		
Presenter:	Zoey Henson		
Mentor:	M. Grant Norton		**Honors:** Yes
Co-Authors:	Christian Martin Cuba Torres, M. Grant Norton, Su Ha		
Presentation Type:	Poster	**College:** College of Engineering and Architecture	**Major:** Chemical Engineering
Category:	Engineering and Physical Sciences		

ABSTRACT:

Fuel cells are an up-and-coming alternative energy device that is currently being heavily researched for implementation in automobiles, aircraft, tanks, power generators, and many other applications due to their quiet and efficient operation with a broad spectra of fuels such as hydrogen, complex fuels such as diesel and gasoline, and even biofuels like methanol and biodiesel. Solid oxide fuel cells (SOFCs) are a particular type of fuel cell that operates at high temperatures and have the longest operating life of any fuel cell. They operate via oxygen ion transport in the electrolyte while the fuel is oxidized at the same time in the anode, releasing electrons that can be harnessed in an external circuit to produce electrical power.

Nevertheless, there are still research obstacles to overcome—one of the primary difficulties is finding a good anode material that is electrically conductive, has good ion conductivity, and catalyzes the fuel oxidation. Current anode materials utilize noble metals such as platinum, rhodium or nickel, yet platinum and rhodium are expensive and nickel catalyzes the formation of coke in a side reaction. However, recently it has been shown that molybdenum dioxide (MoO_2) shows little to no coke formation and a stable performance over an extended period of time with a variety of logistic fuels. Although this research proved that MoO_2 is highly active, the conditions were not similar as in SOFC; a continuous flow of molecular oxygen was employed rather than oxygen anions that are present in SOFC. In order to further test the versatility of MoO_2 as a SOFC anode material, the oxidation ability must be tested in the absence of molecular oxygen.

The present research project models the fuel oxidation in a SOFC anode by using an oxygen deficient environment—relying only on oxygen from the MoO_2 itself to oxidize the fuel. Pulses of methane, are sent to the dioxide and the products from the reaction are measured as a function of oxygen stoichiometry. A subsequent purge of argon gas will allow time for the lattice oxygen to diffuse to the surface of the particle.

Presentation Number 3

Abstract Title:	**Inhibition of Propionibacterium Acnes by Essential Oils**		
Presenter:	Adrienne Wilen		
Mentor:	Kirstin Malm		**Honors:** No
Co-Authors:			
Presentation Type:	Poster	**College:** College of Veterinary Medicine	**Major:** Biochemistry
Category:	Applied Sciences		

ABSTRACT:

Propionibacterium acnes are a known contributor to acne. In this experiment, five essential oils were tested as potential inhibitors of *Propionibacterium acnes.* Three pus samples were taken from inflamed skin and were incubated in thioglycolate broth. Each sample was streaked for isolation of *Propionibacterium acnes* on blood agar. Samples of *Propionibacterium acnes* were subjected to different dilutions of tea tree, lemon, rosemary, garlic, and onion essential oils and incubated. The plates were observed throughout incubation for growth inhibition. The 10% dilutions of the essential oils showed little inhibition. Undiluted tea tree oil, onion oil, and rosemary oil showed significant inhibition of the growth of *Propionibacterium acnes.* None of these oils are safe to use on the skin undiluted, so future inhibition studies should be done to test lesser concentrations of tea tree oil, onion oil, and rosemary oil under conditions more similar to those of the skin.

Presentation Number 4

Abstract Title:	**The Effect of Perceived Sexual Orientation on Workplace Evaluation**		
Presenter:	Amanda Thomson		
Mentor:	Dr. Julie Kmec		**Honors:** No
Co-Authors:			
Presentation Type:	Poster	**College:** College of Arts and Sciences	**Major:** Sociology
Category:	Social Sciences		

ABSTRACT:

The primary goal of this study is to identify whether people acting in the capacity as an employer have underlying negative bias against individuals they perceive to be gay or lesbian. Studying the influence of sexual orientation in the work place is important because negative prejudice toward someone based on his or her sexual orientation could lead to discrimination in the workplace—discrimination that has negative economic consequences. Participants complete one of four versions of an online survey. The versions each contained a photo of an office space with a computer that had a screensaver. Each version had a different screensaver; one version depicted a screensaver with a photo of two women kissing their partner (to indicate the owner of the desk was lesbian), another depicted two men kissing in a similar pose (to indicate that the owner of the desk was gay). Another photo depicted a man and woman kissing (to indicate that the owner of the desk was heterosexual) and the last photo was of a waterfall (to indicate that the owner of the desk had a sexual orientation that was unknown). The survey following the photo asked respondents to evaluate the person's desk they were viewing in the photo. Significant differences were found in how people rated those perceived to be gay versus lesbian. In addition, those perceived to be heterosexual, across the board, were rated higher in desirable traits. This indicates that negative prejudice toward non-mainstream sexual orientations is present in the workplace

Presentation Number 5

Abstract Title:	**The Potential Role of Deamidation of Asparagine 155 within Neural Tropomodulin2**		
Presenter:	Jessica Hawkinson		
Mentor:	Alla Kostyukova		**Honors:** Yes
Co-Authors:	Kevin Gray, Alla Kostyukova		
Presentation Type:	Poster	**College:** College of Veterinary Medicine	**Major:** Genetics and Cell Biology
Category:	Molecular, Cellular, and Chemical Biology		

ABSTRACT:

Actin is a protein that can form filaments and the formation of those filaments is important for cell shape. There are many proteins that bind to actin filaments and change their dynamics by regulating polymerization and depolymerization. Tropomodulin (Tmod) is one of these proteins that binds to the pointed end of actin filaments. There are three isoforms of Tmod found in brain cells; Tmod1, Tmod2, and Tmod3. Tmod 2 is a neural specific isoform. In Tmod2 there is an NGxG motif that spontaneously undergoes deamidation of asparagine changing it to aspartic acid. When the asparagine loses the amine it then changes from a positively charged to a negatively charged residue. The exact role of this motif is not well understood. It is thought to act as a molecular clock that cues degradation of the Tmod2 protein and may also change the binding partners of the protein. The local environment of the asparagine influences the rate of deamidation, with non-bulky amino acids increasing the rate and bulky amino acids slowing the rate. Since the NGxG motif is found in neural Tmod, we hypothesized that the NGxG motif acts as a molecular clock to regulate accumulation of Tmod2. To test this hypothesis two mutations were created. One mutation was Tmod2[N155D] where the Tmod2 asparagine is deamidated from the start. Tmod2[N155D] already has an aspartic acid so no asparagine is present. The second mutation chosen was Tmod2[G156A] since alanine is similar to glycine yet has a big enough side chain to slow the rate of the deamidation with minimal disturbance to the surrounding environment. We wanted to test both of these mutations for known functions as well as neurite outgrowth. These mutations were incorporated into Tmod2 mammalian overexpression vectors with a cherry fluorescent protein tag as well as Tmod2 E. Coli expression vectors with a poly-histidine tag. We have currently obtained mammalian overexpressed vectors comprising of each mutation and plan to express them in PC12 cells to look for changes in neurite outgrowth. We will also purify the mutated tropomodulins expressed in E. Coli and test them for binding by native gel electrophoresis.

Presentation Number 6

Abstract Title:	**The Impact of Orthopedic Implants on Electromagnetic Field Exposure Safety Standards**		
Presenter:	Juan Mejia		
Mentor:	Robert Olsen		**Honors:** No
Co-Authors:	Bob Olsen		
Presentation Type:	Poster	**College:** College of Engineering and Architecture	**Major:** Mechanical Engineering
Category:	Engineering and Physical Sciences		

ABSTRACT:

Human exposure to electromagnetic fields is regulated by a number of standards developed by agencies such as the International Radiation Protection Commission. These standards are developed by calculating the electromagnetic fields within the body for a given exposure to an externally generated electromagnetic field or EMF. The amplitude of the external field is determined by increasing it until the fields inside the body are below a threshold that is determined by the threshold for known biological effects (the "basic restriction"). There is, however, a problem with this methodology because it is assumed that the human body is free of any implanted devices. This is not the case for a person with one or more medical orthopedic implants. In these cases, the implant can cause the electromagnetic field in the body at an otherwise acceptable amplitude to exceed the "basic restriction." In this case, the standards for protection of the public may not be adequate to protect individuals from exposure to electromagnetic fields. More specifically, the electric fields at the tips of rods implanted in the body can significantly exceed the electric fields that would exist in the absence of the rod. In this research, the adequacy of existing standards for electromagnetic field exposure of humans with orthopedic implants has been investigated. It has been found that there are situations for which existing standards may not be adequate for these people.

Presentation Number 7

Abstract Title:	**The Correlation between Teaching Style and Student Comprehension**		
Presenter:	Yelena Novik, Hannah Schweiter, Samantha Pedersen		
Mentor:	Andy Cavagnetto		**Honors:** No
Co-Authors:	Nemer Tello, Hannah Schweiter, James Marr, Andy Cavagnetto		
Presentation Type:	Poster	**College:** College of Veterinary Medicine, College of Education,	**Major:** Biochemistry, Elementary Education
Category:	Social Sciences		

ABSTRACT:

The purpose of this study is to analyze videos in an early education setting with a primary focus on the teacher talk. By analyzing the teacher talk we hope to find a correlation between the amount and type of talk with the results of both content and motivation based test scores. The first phase of the project involves tracking multiple test scores throughout a period of 3 years. During this phase our research involves analyzing the videos by coding different categories of when the teacher talks, what their talk is related to, what level of control the teacher holds with their talk, and how the talk influences student learning. The final phase involves comparing the data through statistical analysis. This will allow for a better understanding on what the best approach teachers can take in order to increase student comprehension. This may direct future research of an inquiry-based approach to student learning.

Presentation Number 8

Abstract Title:	**A Review of Immunocontraception Methods as a means of Elephant Population Control**		
Presenter:	Kelsie Viloria		
Mentor:	Patrick Carter		**Honors:** No
Co-Authors:			
Presentation Type:	Poster	**College:** College of Arts and Sciences	**Major:** Zoology
Category:	Organismal, Population, Ecological, and Evolutionary Biology		

ABSTRACT:

Populations of the African elephant are growing rapidly in Southern Africa, resulting in an overpopulation of elephants in several areas and causing severe environmental damages. In closed systems with limited food, space and water, the manipulation of the population's growth rate is of critical importance to the future survival of that population. In 2013 I was involved in collecting data on elephant population control in South Africa; here I review the literature on immunocontraceptive methods as a means of elephant population control vs. the two most common methods – culling and translocation.

The goals of immunocontraceptive programs are to provide contraception for elephants so that relocation or immobilization of the same individual year after year is not required. This non-hormonal form of contraception is based on the same principles of disease prevention through vaccination. It stimulates the production of antibodies against the proteins in the immunocontraception vaccine, allowing the antibodies to attach themselves to the sperm receptors on the zona pellucid covering the egg, thereby preventing pregnancy. The implementation of such a program in the Greater Makalali Private Game Reserve in the Limpopo Province of South Africa has produced phenomenal results – a 95% efficacy rate. The project population size for the Makalali population without immunocontraception was estimated to be 108 animals by 2010. However, with immunocontraceptive reproductive control initiated, there was a significant reduction in the population growth from 2003 to 2010 such that the estimated population size in 2010 was only 72. This is an estimated reduction of 33% in the population size in the 10 years of the program. This method of population control has also proven to be successful in other animals as well, such as wild horses, lions, and wild bison, and my soon become a preferred method of wildlife population control.

Presentation Number 9

Abstract Title:	**The Effect of CNO on Rat Happiness**		
Presenter:	Emily Sawyer		
Mentor:	Lane Brown		**Honors:** No
Co-Authors:			
Presentation Type:	Poster	**College:** College of Arts and Sciences	**Major:** Psychology
Category:	Molecular, Cellular, and Chemical Biology		

ABSTRACT:

In examining how the drug clozapine-N-oxide, from here on referred to as CNO, effects rat happiness, baseline data was collected to determine usual frequency of rat chirps. These high frequency ultrasonic chirps that are not audible to the bear human ear, can be recorded and are shown to indicate rat laughter. The number of these chirps was used as observable behavior to measure happiness. This study hypothesized and tested whether injection of CNO prior to recording rat chirps would increase the frequency of these chirps when compared to the baseline data. Closely following the injection of CNO into the bloodstream, the rats were observed to have a higher frequency of chirps, showing a positive correlation between the two.

Presentation Number 11

Abstract Title:	**Hunting for the Tropomodulin Binding Partner**		
Presenter:	DJ Cundy III		
Mentor:	Natalia Moroz		**Honors:** No
Co-Authors:	Natalia Moroz, Mert Colpan, Alla Kostyukova		
Presentation Type:	Poster	**College:** College of Engineering and Architecture	**Major:** Bio-Engineering
Category:	Molecular, Cellular, and Chemical Biology		

ABSTRACT:

Actin filaments are an essential component of muscle cells. Tropomodulins are a family of proteins that regulate the length of actin filaments by capping the slow growing pointed end. There are two domains in Tmod1: the disordered N-terminal domain that contains tropomyosin- and actin-binding sites and the folded C-terminal (LRR) domain. Prior research has indicated the presence of regulators that control the targeting of Tmod1 to the pointed ends in sarcomeres of muscle cells. Most likely, Tmod's LRR domain is involved in this interaction. Prior possible binding sites were localized. Earlier, a template Tmod1 mutant without cysteines, Tmod1(-3C), was created. Several non-conserved amino acid residues nearby the possible binding site were then mutated to cysteine. In this work, mutants Tmod1(-3C), Tmod1(K228C) and Tmod1(M255C) were purified using affinity and ion-exchange chromatography and additively modified at their only SH-group with two different bi-functional photo-activated cross-linkers, each linker being of different length and had various functional groups. Lysate of C2C12 cells and extract from actin acetone powder were used as a source of Tmod's unknown shuttle protein. Each modified Tmod sample was mixed with C2C12 lysate and actin extract in the dark, exposed to UV and then purified by immune-precipitation assay using Tmod1 antibody. All samples were analyzed by SDS-PAGE and Western Blot. For Tmod1(-3C) only the expected single Tmod1 band was detected. However, for Tmod1(K228C) and Tmod1(M255C) we observed additional thin bands within 75-250 kDa molecular weight region. We suggest that the high molecular-weight bands correspond to the Tmod1 covalently bound with other proteins and an unknown binding partner could be among them. These results support our hypothesis. Further experiments could attempt to identify the shuttle protein via mass spectrometry, or any other equivalent approach.

Presentation Number 12

Abstract Title:	**Conflict, Conversion, or Co-Existence? Islamic and Western Relations**		
Presenter:	Eli Perez		
Mentor:	Professor R. Charles Weller		**Honors:** No
Co-Authors:			
Presentation Type:	Poster	**College:** College of Engineering and Architecture	**Major:** Bioengineering
Category:	Humanities		

ABSTRACT:

One of the most prevalent issues plaguing today is the relationship between the Western and Islamic worlds. Fighting between these two civilizations has occurred for centuries; which has led many to wonder if the conflict will ever end. Conflict has only escalated in our modern world; especially nowadays where people in the Islamic world claim the only solution to the conflict is the destruction of America and its western ideals. With no end of conflict in sight are these worlds destined to be forever in a state of conflict, to convert the other to their ways of belief, or will they someday co-exist peacefully with one another? This project helps provide an answer to this question based on several hundred years of historical context. The conclusion drawn was that there is no reason that both worlds cannot co-exist peacefully; with the only thing standing between them being a history of animosity where no side has attempted to make amends.

Presentation Number 13

Abstract Title:	**Analysis of Organizations Best Practices for Recovering Post 9/11 Veterans and the Implications for Success**		
Presenter:	Jayme Anderson		
Mentor:	Dr. Dana Baker		**Honors:** No
Co-Authors:	Dr. Dana Baker		
Presentation Type:	Poster	**College:** College of Arts and Sciences	**Major:** Psychology
Category:	Social Sciences		

ABSTRACT:

The need for a veteran's successful recovery from combat related traumas was brought to light with the rise of Posttraumatic Stress Disorder (PTSD) and Traumatic Brain Injury (TBI) diagnosis. This coincided with awareness of aggressive behaviors, suicides, drug and alcohol use, and marital turmoil among returning soldiers. (Heyman, 1999: McCarl, 2013: Riviere, 2012: Seal, 2009: Tateno, 2003) In response to this public challenge, organizations serving veterans have articulated positions on appropriate strategies for addressing combat traumas among Post 9/11 combat veterans. The purpose of this study is to analyze current strategies for providing recovery assistance to combat veterans and their families. In particular this study explores differences between these strategies, to find strengths and weaknesses of these best practices. The goal is to highlight areas that are having great success and areas of need to assist in a more thorough, al-encompassing policy to address proper care of the veteran in regards to establishing a recovery rich home environment by providing education and promoting information sharing among the veteran and his/her family members or care takers.

1. Heyman, R. E., & Neidig, P. H. (1999). A comparison of spousal aggression prevalence rates in U.S. Army and civilian representative samples. Journal Of Consulting & Clinical Psychology, 67(2), 239-242.
2. MCCARL, L. I. (2013). "TO HAVE NO YESTERDAY": THE RISE OF SUICIDE RATES IN THE MILITARY AND AMONG VETERANS. *Creighton Law Review*, *46*(3), 393-432 <
3. Riviere, L. A., Merrill, J. C., Thomas, J. L., Wilk, J. E., & Bliese, P. D. (2012). 2003-2009 Marital Functioning Trends Among U.S. Enlisted Soldiers Following Combat Deployments. Military Medicine, 177(10), 1169-1177.
4. Seal, Karen H., Thomas J. Metzler, Kristian S. Gima, Daniel Bertenthal, Shira Maguen, and Charles R. Marmar. Trends and Risk Factors for Mental Health Diagnoses Among Iraq and Afghanistan Veterans Using Department of Veterans Affairs Health Care, 2002–2008. American Journal of Public Health: September 2009, Vol. 99, No. 9, pp. 1651-1658.
5. ateno, Amane M.D.; Ricardo E. Jorge, M.D.; Robert G. Robinson, M.D. (2003). Clinical Correlates of Aggressive Behavior After Traumatic Brain Injury. The Journal of Neuropsychiatry and Clinical Neurosciences, 15:155-160. doi:10.1176/appi.neuropsych.15.2.155

Presentation Number 14

Abstract Title:	**Quadcopter in Artificial Intelligence Research**		
Presenter:	Maher Abujelala		
Mentor:	Matthew E. Taylor		**Honors:** Yes
Co-Authors:			
Presentation Type:	Poster	**College:** College of Engineering and Architecture	**Major:** Computer Engineering
Category:	Computer Science, Mathematics, Statistics, and Information Sciences		

ABSTRACT:

In this project, a quadcopter (quad-rotor helicopter) is used to showcase how data can be interpreted into a set of algorithms and functions that make a corrected autonomous flight. The quadcopter used in this project is a commercial quadcopter called AR.Drone 2.0. The main goal of this project is to make the quadcopter fly autonomously based on previous experience and choose the shortest/optimum path that will lead to a better experience. To collect the required data to accomplish the experiment, a student will fly the quadcopter and follow a particular map for the first few times. Even though the student is following the same map, he cannot follow the paths precisely on the map because of the difficulties associated with quadcopter control. Therefore, the autonomous system should fly the quadcopter by following the shortest/optimum paths based on the students' experience. The autonomous system does not repeat the best trial, but it rather tries to find the shortest/optimum paths based on the previous trials. Repeating this experiment would most likely result in more optimum flight. The results of this experiment can be used to improve some of the applications where tracking systems, such as GPS, cannot be afforded.

Presentation Number 15

Abstract Title:	**Elucidating the Fusogenic Efficacy of Nipah Virus Fusion Proteins and Mutant Derivatives**		
Presenter:	Bryce Henderson		
Mentor:	Hector Aguilar		**Honors:** Yes
Co-Authors:	Hector Aguilar		
Presentation Type:	Poster	**College:** College of Veterinary Medicine	**Major:** Biochemistry
Category:	Molecular, Cellular, and Chemical Biology		

ABSTRACT:

Nipah virus (NiV) is an enveloped, negative-sense, single-stranded RNA virus. Like other enveloped viruses, NiV expresses specialized fusion proteins which cascade into a merger of viral and cellular membranes. Mechanistically, the viral entry cascade for NiV remains largely unknown. Recent studies have suggested an inside-out signaling mechanism, between fusion proteins, where fusion can be initiated through cytoplasmic tail interactions. It is known that there is some sort communication between F and G, beginning after G binds to an ephrin B2 receptor, and that there are intermediate structures corresponding to stages in fusion. In this study, we hypothesize that if a point mutation affects a stage of fusion, then that point is likely necessary for, or involved in, that specific stage. A widespread polling of point mutations elucidates the regions responsible for each stage of the fusion cascade. This opens the door to future development of inhibitory therapeutics.

Methodologically, fluorescent microscopy was used to measure the spreading of lipid and cytoplasmic dyes when stained cells containing the ephrin B2 receptor were layered on top of unstained cells containing G and F, or G and an F derivative. Once layered, cells were allowed to bind at temperatures that would not permit fusion. Then, the temperature was raised and the cells were allowed to fuse for various, predetermined amounts of time. After the allotted time, fusion was halted and data was gathered. Current data suggests that point mutations in the cytoplasmic tail of F result in overall hypofusogenicity, negatively affecting the level of all stages of fusion. Our data supports the conclusion that the cytoplasmic tail of F is necessary for initiating the fusion cascade. In the future, we hope to evaluate the fusogenicity of other regions in F and to map the regions of F responsible for the stages in fusion. If this mapping is established, antiviral peptides specific for a stage in F's fusion could be created and used as treatment for a NiV infection.

Presentation Number 17

Abstract Title:	**Comparative Study of Novel Recombinant Proteins Detected by Human Antibody to Trichomonas vaginalis**		
Presenter:	Evan Klein and Patrick Joyce		
Mentor:	Dr. John Alderete		**Honors:** Yes
Co-Authors:	Patrick Joyce		
Presentation Type:	Poster	**College:** College of Veterinary Medicine; College of Arts and Sciences	**Major:** Biochemistry - Molecular Biology Option; Anthropology
Category:	Organismal, Population, Ecological, and Evolutionary Biology		

ABSTRACT:

Trichomonas vaginalis (Tv) is the causative agent for the sexually-transmitted infection, trichomonosis. It has been found that sera from men and women exposed to Tv are seropositive to the highly immunogenic trichomonad α-actinin and its amino-terminus truncated protein, called ACT-P2. We performed Tv α-actinin epitope mapping and found that 13 epitopes of the natural protein are recognized by positive control sera from women and 5 of the same epitopes are recognized by positive male sera. Therefore, we hypothesized that a novel protein containing only these 13 epitopes should be detected by antibody to Tv in lower concentrations. Thus, a novel recombinant protein called actinin-string of epitopes (ACT::SOE) was synthesized in *E. coli*. Further, it is known that the proteins aldolase, enolase, and glyceraldehyde 3-phosphate dehydrogenase (GAPDH) are all present on the surface of Tv and immunogenic in humans. Therefore, a second string of six epitopes was synthesized in *E. coli* and called AEG::SOE. The ACT::SOE, ACT-P2, and AEG::SOE recombinant proteins were analyzed via immunoblots to test the proteins' reactivity with male and female sera. The ACT-P2 and AEG::SOE successfully detected the positive sera containing Tv antibody, but the immunoblots containing ACT::SOE were nonreactive. It was determined that the ACT::SOE went to inclusion bodies and therefore was not detectable by Tv antibody. In response, the ACT::SOE was treated with preparations of urea to solubilize the protein and recover its natural conformation. However, the protein was only soluble in urea and therefore could not be used for further immunoassays. Nonetheless, we continued experimentation with ACT-P2 and AEG::SOE, performing enzyme-linked immunosorbent assays (ELISAs). In multiple ELISAs, both ACT-P2 and AEG::SOE were tested against the monoclonal antibody HA423 that detects an epitope sequence in α-actinin. Both recombinant proteins similarly detected Tv antibody in positive female sera, often times binding more antibody than HA423. Therefore, it was determined that the recombinant proteins ACT-P2 and AEG::SOE can detect seropositive female sera to Tv antibody, concluding that both proteins are potential targets for detection of Tv exposure in humans.

Presentation Number 18

Abstract Title:	**The in Vivo Temperature Response of Rubisco Kinetics in Oryza Sativa.**		
Presenter:	Thomas Sexton		
Mentor:	Asaph Cousins		**Honors:** Yes
Co-Authors:	Ryan Boyd, Berkley Walker, and Asaph B. Cousins		
Presentation Type:	Poster	**College:** College of Arts and Sciences	**Major:** Biology With Botany Option
Category:	Molecular, Cellular, and Chemical Biology		

ABSTRACT:

Increases in crop production are needed to feed the growing world population. To help meet this goal, the C_4 Rice Project has set out to increase rice productivity because of its importance as a food source around the world. To increase productivity, the C_4 rice project has proposed to enhance the photosynthetic efficiency of rice. During photosynthesis, carbon dioxide (CO_2) is taken up by the plant and used to make organic compounds for energy and growth. The uptake of CO_2 is catalyzed by the enzyme Rubisco, and is often the rate-limiting step of photosynthesis. Rubisco is a slow and non-specific enzyme that binds both CO_2 and oxygen (O_2). When Rubisco incorporates O_2, the plant undergoes a scavenging process known as photorespiration. This results in a net loss of CO_2 and energy that could have been used for plant growth. A decrease in photorespiration means a more efficient uptake of CO_2 and energy usage, thus increasing grain yields. The C_4 Rice Project is attempting to avoid photorespiration by altering leaf metabolism to elevate the CO_2 concentration inside the leaf where Rubisco is present. This would promote the carboxylation reaction by outcompeting oxygenation reactions. Currently, it has been demonstrated that Rubisco from different species has adapted to different CO_2 concentrations, resulting in different enzymatic kinetic parameters. However, the kinetic parameters, which describe the speed of catalysis and affinity of an enzyme to its substrates, have not been measured for rice Rubisco. This knowledge gap raises the question: *If the CO_2 concentration around rice Rubisco is elevated, will the native enzyme limit rates of photosynthesis under this high CO_2 environment?* The first step to answering this question is to understand the species-specific kinetic parameters in rice, and how they change with temperature. Here, we measured *in vivo* Rubisco kinetic parameters from 10-40 ^oC in rice. We will present rice-specific parameters used to model changes in photosynthesis with temperature and different CO_2 concentrations. These parameters can predict how the native Rubisco in rice will perform in comparison to a Rubisco adapted to a high CO_2 environment.

Abstract Title:	**What is the Age of Majority?**		
Presenter:	Brandon Leonard		
Mentor:	Dr. Dana Baker		**Honors:** No
Co-Authors:			
Presentation Type:	Poster	**College:** College of Arts and Sciences	**Major:** Social Sciences
Category:	Social Sciences		

ABSTRACT:

In *Roper v. Simmons (03-633) 543 U.S. 551 (2005) 112 S. W. 3d 397, and Atkins v. Virginia (00-8452) 536 U.S. 304 (2002),* the Supreme Court of the United States found that portions of the population cannot be subject to certain punitive criminal sentences due to "diminished capacities to understand and process information, to communicate, to abstract from mistakes and learn from experience, to engage in logical reasoning, to control impulses, and to understand others' reactions. Their deficiencies do not warrant an exemption from criminal sanctions, but diminish their personal culpability." Risky behavior, recognition of long term consequences and logical reasoning, due to diminished capacity, has been documented as 50% more likely in early adulthood (ages 18-22) as compared to baseline adults (ages 23-30). The ignorance of this evidence in the implementation of minimum mandatory sentencing could be understood as irresponsible administration of public policy and may be unconstitutional under the 8th Amendment.

This paper will examine the disproportionate representation of crime in early adulthood and the long term consequences created by arresting over 40% of males before their 23rd birthday. The cumulative consequences created by flat rate punishment during this developmental stage could be considered excessive under the 8th Amendment.

Presentation Number 20

Abstract Title:	**Mechanical Analysis of Cartilage Tissue Grown with Biochemical and Mechanical Stimuli in a Continuous Centrifugal Bioreactor**		
Presenter:	Abigail Smith		
Mentor:	Bernard Vanwie		**Honors:** No
Co-Authors:	Chrystal Quisenberry, Arshan Nazempour, Bernard VanWie, Vincent Idone, Nehal Abu-Lail		
Presentation Type:	Poster	**College:** College of Veterinary Medicine	**Major:** Biochemistry
Category:	Engineering and Physical Sciences		

ABSTRACT:

Articular cartilage is a soft, white tissue located on the end of bones that allows for smooth movement of the bones at the joints. Articular cartilage is unable to regenerate due to its lack of blood vessels. This makes damage to cartilage a major problem. Chondrocytes, the cells that make up articular cartilage, are derived from mesenchymal stem cells. Damaged cartilage can result in disability and pain in joints, making it necessary to replace damaged articular cartilage. Cartilage grown in a Centrifugal Bioreactor will be examined. The goal is to test how the conditions of the bioreactor will affect the mechanical properties of the engineered cartilage with respect to native cartilage. Using the atomic force microscope (AFM) we will measure the elastic modulus and friction coefficient of the tissue and correlate its mechanical properties with the conditions it was grown. With continued research, we aim to investigate the mechanism which causes the changes in the mechanical properties and the mechanotransduction pathways that allow for these changes during the development of the tissue. We hypothesize that N-cadherins and β1-integrins, proteins embedded in the surface of the chondrocytes, play a role in the observed mechanical properties of the tissue and researching this correlation will be the next step in our research.

Abstract Title:	**Gene Set Enrichment Analysis of Residual Feed Intake in Hereford Cattle**		
Presenter:	Lance Kidder		
Mentor:	Kristen Johnson and Holly Neibergs		**Honors:** No
Co-Authors:	A.J. Wojtowicz, J.F. Taylor, C.M. Seabury, K.A. Johnson, H.L. Neibergs		
Presentation Type:	Poster	**College:** College of Agricultural, Human, and Natural Resources	**Major:** Animal Science
Category:	Molecular, Cellular, and Chemical Biology		

ABSTRACT:

Feed comprises 66% and 77% of the total cost of calf and yearling finishing systems, respectively. Heritabilities for feed efficiency (FE, estimated as residual feed intake, RFI) have ranged from 0.08 to 0.46 in previous studies, highlighting the potential for selection to improve FE within the beef industry. The objective of this study was to identify gene pathways for FE as measured by RFI through the use of gene set enrichment analysis (GSEA) using single nucleotide polymorphisms (SNPs) as proxies for bovine genes. A population of 847 Hereford cattle (181 purebreds and 666 Hereford crossbred animals consisting of 23 females and 824 males ranging in age from 210 to 496 days) from a single ranch were evaluated for a period ranging from 70 to 140 days on feed (DOF). Only 31 animals were fed over 72 days. Average daily gain (ADG), dry matter intake (DMI), initial weight (IW), mid-test metabolic weight (MMWT), and DOF were recorded for each individual. Covariates for the genome wide association study (GWAS) consisted of age, sex, ADG, DOF and % Hereford. GWAS was followed by GSEA of SNP data with *Bos taurus* gene sets from GO, KEGG, Panther, Reactome, and Metacyc. Gene sets containing ≤10 or ≥200 SNPs were excluded. A total of 19,598 bovine genes were mapped within gene sets, and proxy SNPs were mapped to genes located within 20 kb. The null distribution of the GSEA test statistic was approximated using 10,000 random permutations. Genotypes were obtained from the Illumina BovineSNP50 (N = 361) and BovineHD (N = 486) BeadChips and imputed to 778,000 SNPs using Beagle. The GO pathway GO:0044706 multi-multicellular organism process with 90 genes was significant for RFI with an false discovery rate of 0.061 and a normalized enrichment score of 3.978. There were a total of 51 leading edge genes in GO:0044706. The top 10 genes were: *PGR, CORIN, STAT5B, TIMP1, PCSK5, THRB, NR2F2, MMP2, FKBP4, and JUNB.* Heritability for RFI was estimated to be 0.49. These results suggest that genetic selection for RFI has potential to dramatically affect the efficiency and, therefore, profitability of beef cattle production.

Presentation Number 22

Abstract Title:	**Who Gets the Money? Non-Ethnic vs. Multi-Ethnic Organization Affiliation Influence on Undergraduate Scholarship Recipients**		
Presenter:	Vanessa Delgado		
Mentor:	Dr. Julie Kmec		**Honors:** No
Co-Authors:			
Presentation Type:	Poster	**College:** College of Arts and Sciences	**Major:** Sociology
Category:	Social Sciences		

ABSTRACT:

This study investigates the affect organizational and race affiliation has on a male student's ability to receive a scholarship. The first focus of this study is to encompass how society values traditional Caucasian organizations over multi-ethnic organizations. The second focus is to understand if race, specifically Caucasian versus Latino, is a determining factor for being a scholarship recipient. Research indicates that students affiliated with multi-ethnic organizations come from underrepresented backgrounds and are less likely to attend higher education. Therefore, it is important to understand how this affiliation with non-multi ethnic versus multi-ethnic organizations can impact the likelihood of becoming a scholarship recipient, a resource that increases one's ability to attend higher education. These findings will investigate whether or not a student's ability to receive a scholarship is determined based on their race and/or organizational affiliation.

Presentation Number 23

Abstract Title:	**Understanding Rural Communities and Personal Values**		
Presenter:	Shawna Kelly		
Mentor:	Kathleen Ryan		**Honors:** No
Co-Authors:			
Presentation Type:	Poster	**College:** College of Agricultural, Human, and Natural Resources	**Major:** Interior Design
Category:	Arts and Design		

ABSTRACT:

The role of participatory design in this design studio was to help students to better understand the role of the community in the design process, and to gain understanding about how the design process works in actual practice.

The purpose of the project was to determine student's understanding the design process when designing with residents of a rural community through a participatory design workshop. Students completed two surveys during the two month long design project. The surveys focused on understanding and communicating with the during the design process.

Interior design students visited an un-incorporated small town in the Pacific Northwest to work with the local historical society to develop their one-room schoolhouse into a history museum. Students facilitated a design workshop with community members. Students asked prompting questions to gather pertinent information to begin their designs. Students then proceeded to work on the design ideas generated at the workshop. A final review was held by video-conference.

Following the workshop, the students reported that they had better connection to the community through the workshop. The students shared a sense of positive contribution to the process of community design, but the results of the first survey showed that not everyone had gained a better understanding of their own personal values in the process. The second survey revealed that the student's had a better understanding of how design problems are approached by others. Students felt actively involved with the community after the workshop. They also gained a better understanding of their own personal values after completing their design work. Students also suggested that additional meetings in person, as well as smaller group discussions, would have benefited the design process.

This study suggests that due to students understanding of how community members work on a problem, students have gained a better understanding of their own personal values throughout the design process. Students completed designs for the community while developing a more clear understanding of their own part in a collaborative process.

Presentation Number 24

Abstract Title:	**Sex Does Not Influence the Effectiveness of Anti-Inflammatory Drugs at Reducing Pain**		
Presenter:	Kelly Hewitt		
Mentor:	Dr. Rebecca Craft		**Honors:** No
Co-Authors:	AE Haas, RM Craft		
Presentation Type:	Poster	**College:** College of Veterinary Medicine	**Major:** Neuroscience
Category:	Organismal, Population, Ecological, and Evolutionary Biology		

ABSTRACT:

Ibuprofen is a common over-the-counter non-steroidal anti-inflammatory drug used for the treatment of mild acute and chronic pain. Although women are much more likely to experience painful conditions and use over-the-counter treatments such as ibuprofen, few studies have investigated sex differences in ibuprofen's pain-relieving properties. No study to date has examined sex differences in the effectiveness of ibuprofen in rats with chronic pain. The purpose of this experiment was to determine whether there are sex differences in the pain-relieving and anti-inflammatory effects of ibuprofen in rats. It was hypothesized that ibuprofen would prove to be more effective in female than male rats. Baseline measurements were obtained on tests used to quantify thermal sensitivity, mechanical sensitivity, biased weight-bearing placement, and ventral-dorsal paw thickness. Then, complete Freund's adjuvant, an inflammatory reagent, was injected into the right hindpaw of male and female adult rats to induce chronic pain; three days later, a dose of ibuprofen was administered intraperitoneally. Following a thirty-minute period, all tests were repeated. Ibuprofen dose-dependently produced significant pain-relief and anti-inflammation on appropriate tests. Ibuprofen dose-dependently increased thresholds to a mechanical and thermal stimulus and decreased swelling in the inflamed paw. Weight displacement was similar between the two hindpaws. Contrary to the hypothesis, significant sex differences were not observed on any of the measures, suggesting males and females may benefit equally from ibuprofen's pain-relieving effects. Despite women's preference toward over-the-counter treatments, this experiment suggests there is no need to take sex into account when administering ibuprofen.

Presentation Number 25

Abstract Title:	**Synthetic Progress Towards an Inhibitor for Matrix Metalloproteinase-14**		
Presenter:	Andrew Arndt		
Mentor:	Dr. Cliff Berkman		**Honors:** No
Co-Authors:	Dr. Cliff Berkman and Desiree Mendes		
Presentation Type:	Poster	**College:** College of Arts and Sciences	**Major:** Chemistry
Category:	Engineering and Physical Sciences		

ABSTRACT:

The purpose of this study is to synthesize an inhibitor for MMP-14. Matrix Metalloproteinase's (MMPs) are a class of zinc-requiring enzymes that take part in the natural destruction of connective tissues in the body, which make them a key player in the progression of many diseases, including inflammatory, malignant and degenerative conditions. Due to this ability, MMPs play a role in the metastasis of cancerous cells by degrading the surrounding extra cellular matrix and a correlation has been shown between MMP expression and the potential of a tumor to be malignant. This makes MMPs a popular target for inhibition in an attempt to create a possible drug to slow and lower the chance of metastasis in cancer patients. The MMP that is specifically targeted in this research is MMP-14, which is a membrane type MMP, meaning it anchors to the cell membrane, and is overly expressed in malignant cells.

Attempts to inhibit MMPs have mainly been focused on targeting the centerfold zinc atom of these enzymes with a good zinc binding group or chelator. In this study, progress was made towards synthesizing a phosphoramidate with a peptide backbone, as an inhibitor for MMP-14.First, the scaffold was created with an amino acid residue on either side of a phosphoramidate, and many combinations of amino acids were tested using the Maestro Molecular Modeling program to determine possible binding strength. A combination of L-tryptophanol and L-Phenylalanine amide was chosen for this specific study, and attempts to synthesize the protected inhibitor were made. Two routes of synthesis were utilized in this study, the first route started with benzyloxydichlorophosphine, and included a C-18 column for purification after both amino acid residues were attached to the phosphorous center. The second route had a starting material of diphenylphosphine and utilized a silica column after the addition of the L-tryptophanol, leading to a purified phosphine, and then the L-phenylalanine amide was attached to the phosphorous centers. Scheme 1 resulted in the presence of protected product, but too little to successfully purify on this scale. Scheme 2 lead to a yield of about 23%.

Presentation Number 26

Abstract Title:	**The Role of Outcome Expectancies in Reversal Learning Performance**		
Presenter:	Amy Nusbaum and Joelle Martin		
Mentor:	Dr. Paul Whitney		**Honors:** No
Co-Authors:	Joelle Martin, Paul Whitney, John Hinson		
Presentation Type:	Poster	**College:** College of Arts and Sciences	**Major:** Psychology
Category:	Social Sciences		

ABSTRACT:

People often have to use feedback to correct errors or adapt to changing circumstances. Reversal learning experiments are a laboratory analog of how decision makers adapt to these changes. In reversal learning one choice option is rewarded more than another, and after this is learned, contingencies are reversed so that the better choice becomes the worse choice and vice-versa. Evidence from individuals with brain lesions suggests that the frontal cortex is critical to such reversal learning (Fellows, 2007). Studies of reversal learning failure by people with frontal lobe damage indicate that frontal lobe damage interferes with the ability to create expectations for outcomes (Schoenbaum, 2007). People without frontal lobe damage will create expectations for outcomes based on feedback throughout the task, and it is the violation of these expectations post-reversal that stimulates the switch in choice preferences.

Our study will test the hypothesis that individual differences in reversal learning performance in people without brain injury are due to the differences in expectations people develop about choice outcomes. A sample of healthy adults (N=80) will make choices between two decks of cards, with each card revealing hypothetical monetary gains or losses. One deck will average more gains, while the other will average more losses. We expect that after approximately 50 trials that participants will choose almost exclusively from the deck associated with more gains. At 4 different points throughout the task, participants will receive prompts asking them to assess the average outcomes of each deck and resume making choices. Halfway through 100 trials the deck outcomes will reverse. The number of post-reversal choices of the formerly better deck will be the dependent measure of reversal difficulty. If our hypothesis is correct, there will be a strong negative correlation between accuracy in estimating average deck outcomes and difficulty adapting to the reversal. We will also use skin conductance recordings (SCR) throughout the task. We expect this data will reveal when the violation of expectation occurs, as the participants will have a high reaction to the feedback immediately after reversal.

Presentation Number 27

Abstract Title:	**The Isolated Transmembrane Domain of Prostate Specific Membrane Antigen is Capable of Oligomerization**		
Presenter:	Brianna Berg		
Mentor:	Dr. Jonel Saludes		**Honors:** Yes
Co-Authors:	Brandan M. Cook and Jonel P. Saludes		
Presentation Type:	Poster	**College:** College of Veterinary Medicine	**Major:** Biochemistry
Category:	Molecular, Cellular, and Chemical Biology		

ABSTRACT:

Prostate cancer (PCa) is the second leading cause of cancer-related deaths among American males. The overexpression of the integral membrane protein called prostate specific membrane antigen is implicated in PCa invasiveness as well as neovasculature of nonprostatic solid tumors. The exact role of PSMA in PCa progression is relatively unknown albeit it is one of the most validated biomarkers for the diagnosis and detection of PCa. While it is widely recognized that many membrane proteins participate in intracellular signal transduction through the lateral association (oligomerization) of their helical transmembrane domains (TMDs), this has not been directly demonstrated in truncated PSMA TMD. Using a combination of solid phase peptide synthesis and biophysical and biochemical assays, we show that PSMA TMD folds into a helix under membrane mimetic environment and is capable of oligomerization. Our findings may elucidate the role of PSMA TMD in PSMA oligomerization and its potential as a model peptide and molecular probe for transmembrane helices. It may also aid in the rational design and development of peptide probes for protein-protein interactions as well as therapeutics that target cancer- and clinically-relevant membrane proteins.

Presentation Number 28

Abstract Title:	**Screening for Durable Rust Resistance in Global Wheat Accessions**		
Presenter:	Graham Ellis		
Mentor:	Dr. Michael Pumphrey		**Honors:** No
Co-Authors:	Peter Bulli		
Presentation Type:	Poster	**College:** College of Agricultural, Human, and Natural Resources	**Major:** Agricultural Biotechnology
Category:	Applied Sciences		

ABSTRACT:

The genus *Puccinia* is an important fungal pathogen that causes the destructive leaf, stem, and stripe rust diseases of wheat. Due to cost-benefit thresholds and environmental damage of controlling the pathogen with fungicides, farmers and breeders prefer to use genetic resistance in their accessions for combating the rust diseases. Wheat producing countries that widely deploy race-specific resistance genes to control rust diseases are putting strong environmental pressure on the pathogen. This environmental pressure exacerbates the pathogens adaptation, often forcing selection for new virulent races that can overcome the resistance and cause disease epidemics. Although there are many rust resistance genes known, few are durable and in general little is understood about their global distribution. Unlike the race-specific resistance genes, durable resistance genes only slow the growth and development of the pathogen. Thus, durable resistance genes do not exert pressure on the pathogen to re-adapt. In addition, durable resistance genes confer resistance to multiple pathogens causing different diseases in wheat. This is why we screened a germplasm core collection of spring wheat accessions from 89 countries for durable rust resistance genes. Using molecular markers we identified the presence/absence of durable rust resistance genes in the core collection. With the geographic information system software ArcGIS, we mapped the distribution of these resistance genes in the 89 countries that these accessions originated from. Using this data, we inferred which durable resistance genes individual countries are using to combat the rust pathogen. The information generated from this work is expected to help improve the efficiency of rust resistance breeding programs worldwide through the effective use of the germplasm core collection.

Presentation Number 29

Abstract Title:	**Charge States of Th-229m: Path to Finding the Half-Life**		
Presenter:	Molly Wakeling		
Mentor:	Dr. Jason T. Burke (Lawrence Livermore National Laboratory), Dr. Steven Tomsovic (WSU)		**Honors:** Yes
Co-Authors:	Jason T. Burke, Timothy J. Cordeiro, Grant Salk		
Presentation Type:	Poster	**College:** College of Arts and Sciences	**Major:** Physics
Category:	Engineering and Physical Sciences		

ABSTRACT:

In order to measure whether the fine-structure constant, a universal fundamental constant, is actually varying in time, a nuclear clock (analogous to the current atomic clock) must be created. A good candidate element for this nuclear clock is thorium-229m, a nuclear isomer of thorium-229. In order to make use of this isomer, however, its deexcitation half-life must be known. In order to measure the half-life, it must also be known whether the thorium-229 nuclei are positively charged or neutral when they decay from uranium-233. If the nuclei are positively charged, they will emit photons when they decay to the ground state, and if they are neutral, they will emit electrons. A Time of Flight (TOF) experiment was conducted to determine whether the thorium-229 recoil nuclei from uranium-233 decay were positively charged or electrically neutral by measuring the time difference between alpha particle detection by a silicon detector and thorium-229 recoil nuclei detection by a multi-channel plate detector (MCP). The experiment proved that the recoiling thorium-229 nuclei were produced in the 1+ and greater charge states. This implies that the thorium-229m isomer will decay by bound internal conversion, emitting photons that can be detected to measure the half-life of this isomeric state, which is currently unknown.

Presentation Number 30

Abstract Title:	**Retinoic Acid Receptor Alpha is Critical in the Differentiation of Male Germ Cells**		
Presenter:	Sophie Ascaso		
Mentor:	Kwan Hee Kim		**Honors:** Yes
Co-Authors:	Natalie Peer		
Presentation Type:	Poster	**College:** College of Arts and Sciences	**Major:** Zoology (Pre-Vet)
Category:	Molecular, Cellular, and Chemical Biology		

ABSTRACT:

The biologically active form of vitamin A, retinoic acid, is critical in testis function and is known to be critical for spermatogonial differentiation. The removal of dietary vitamin A leads to testicular degeneration and infertility in male mice. Retinoic acid signaling is mediated by retinoic acid receptors. To determine the role of retinoic acid receptor alpha (RARA) protein in testicular germ cells, we generated the *Rara* conditional knockout (cKO) mouse strain, which has a *Rara* gene deletion in germ cells. cKO animals showed testicular abnormalities, diminished number of spermatogonia, meiotic defects, and reduction in epididymal sperm number. cKO animals also showed decreased expression of Reproductive homeobox gene 13 (RHOX13) protein, expressed highly in differentiated spermatogonia, specifically in intermediate (In) and B spermatogonia, and remains somewhat in preleptotene spermatocytes. Using RHOX13, we dissected the role of RARA in the differentiation of gonocytes to A1 in the first wave of spermatogenesis and the differentiation of undifferentiated spermatogonia to differentiated spermatogonia in the second wave of spermatogenesis. In the first wave, gonocytes become A1 differentiated spermatogonia directly whereas, in the second wave, gonocytes become stem cells, undifferentiated germ cells, and then differentiate into A1 spermatogonia, in this order. The number of differentiating spermatogonia in cKO testes was compared to wild type by immunohistochemistry using the antibody against RHOX13 protein. Testes from cKO and wild type mice at postnatal day 6 (P6) and P8 were collected and immunostained to examine the role of RARA in the differentiated germ cells from gonocytes in the first wave of spermatogenesis and from mice at P13 and adult mice to examine the role of RARA in the differentiation of undifferentiated spermatogonia to differentiated spermatogonia in the second wave, and subsequent waves of spermatogenesis, respectively. There were decreased counts of RHOX13-positive germ cells in cKO testes compared to wild type at all ages examined, suggesting that RARA in germ cells is critical in the differentiation of spermatogonia from gonocytes in the first wave and from undifferentiated spermatogonia in the second and subsequent waves of spermatogenesis.

Presentation Number 31

Abstract Title:	**The Effect of Nitrate Concentration Upon Aqueous:Organic Liquid Interfacial Properties**		
Presenter:	Shauna Christensen		
Mentor:	Aurora Clark		**Honors:** No
Co-Authors:			
Presentation Type:	Poster	**College:** College of Arts and Sciences	**Major:** Chemistry
Category:	Engineering and Physical Sciences		

ABSTRACT:

Liquid: liquid interfaces exhibit complex organizational structure and dynamics at the molecular level. Soluble ions in the aqueous phase can influence interfacial properties by their ability to polarize and alter the orientation of water. This work compares the interfacial tension, width and molecular orientations at the aqueous liquid interfaces of, *n*-hexane and water as a function of aqueous nitrate concentration. Particular emphasis has been dedicated toward understanding how the hydrogen bond network of water responds to the concentration of nitrate ions. As the molarity of nitrate solution increases the number of distinct layers of water increase. These data indicate that interfacial nitrate causes water to organize in a distinct fashion relative to pure water. This has important implications for understanding how properties defined by the interfacial organization are related to the underlying solvation reactions that drive formation of the phase boundary.

Presentation Number 32

Abstract Title:	**The Importance of Nutrition on Regeneration before and after Injury**		
Presenter:	Audrey Parks		
Mentor:	Erica Crespi		**Honors:** Yes
Co-Authors:			
Presentation Type:	Poster	**College:** College of Arts and Sciences	**Major:** Zoology, pre-vet
Category:	Organismal, Population, Ecological, and Evolutionary Biology		

ABSTRACT:

Proper nutrition is critical during the early stages of development. However, the importance of nutrition before and after an amputation event and the allocation of resources is unknown. To observe the trade offs and allocation of nutritional resources during regeneration, I separated a cohort of Xenopus laevis tadpoles into different feeding treatment groups varying in nutrition before and after amputation, permitting the groups to develop 18 days beyond amputation to allow for regeneration. The groups' physical response was measured quantitatively in regards to regenerated area and cartilage, as well as comparing the development of the cut limb to the individuals' uncut limb. We observed that nutrition pre-amputation only had an influence on regeneration when food was restricted post amputation; tadpoles fed more pre-amputation showed significantly more cartilage growth in both the regenerated and base area of the amputated limb when their diet was restricted after. Similarly, post-amputation nutrition only mattered when the resources were restricted, increasing the resources did not affect regeneration. The regenerated area of tadpoles fed once a day pre-amputation and put on food restriction post-amputation was less than those whose pre-amputation diet was maintained. Surprisingly, tadpoles given more food after amputation allocated more resources into their uncut limb than regenerating the wounded one. When analyzed by a T test, all of these observations were found to be significant with a p value less than 0.05. These findings validate that nutrition does play a role in an animal's ability to regenerate, but as demonstrated by the Xenopus tadpoles, the pre and post trauma resources are allocated differently. Pre-amputation nutrition is more important for over all growth, but it is the resources available during regeneration that affect the quality of regeneration. However, there is an intermediate optimal amount of resources to regenerate wounded tissue; nutrition above a certain threshold will no longer promote regeneration or the developmental process of the wounded tissue. This illustrates that the difference choices concerning resource and energy allocation made by the animal depend on the amount of resources available during the regeneration period.

Presentation Number 33

Abstract Title:	**The Isolation and Characterization of Nineteen Novel Mycobacteriophages at WSU**		
Presenter:	Delaney O'Malley		
Mentor:	William B. Davis		**Honors:** No
Co-Authors:	Aaron Allen, Matthew Aultman, Connor Carrillo, Hailey Colwell, Valerie Ebbay, Miranda Gibson, Matthew Graham, Joseph Lucero-Bendawald, Nicole Mahan, Thomas Minkiewitz, Margaret Over, Jensine Paoletti, Juan Ramirez, Codie Schaut, Seth Schneider, Brianna To		
Presentation Type:	Poster	**College:** College of Arts and Sciences	**Major:** Uncertified - Pre-Pharmacy
Category:	Molecular, Cellular, and Chemical Biology		

ABSTRACT:

Bacteriophages are viruses that only infect bacteria, and are of interest due to their ability to kill harmful bacteria, a property that could be harnessed for use in the medical field. Also, their genomes' overall novelty is expected to lead to major advances in our understanding of genetic evolution. As part of a national project funded by the Howard Hughes Medical Institute, one section of nineteen students in Biology 107 isolated and characterized nineteen novel mycobacteriophages during Fall 2013. These organisms infect mycobacteria, a family of bacteria that cause tuberculosis, and leprosy. The goals of this study are to learn more about the morphology, ecology, and genomes of these mycobacteriophages. To isolate a virus, each student collected soil samples that were then mixed with *Mycobacterium smegmatis* to capture a phage. Pure populations of the bacteriophages were acquired by repeatedly plating samples from single plaques, or clearings in a bacterial lawn that indicate the presence of a virus. Once each student had a pure bacteriophage population, highly concentrated samples of the viral particles were collected to make a DNA lysate. Eighteen out of the nineteen students were able to successfully analyze their lysates using restriction enzyme digestion and each phage was analyzed using transition electron microscopy to discover the phage morphology. We will report on the results of our class project and describe the range of phage discovered in 2013 at WSU.

Presentation Number 34

Abstract Title:	**Domestic Violence Resources for Latino/a Communities: Resource Assessment of Domestic Violence Agencies in Washington State**		
Presenter:	Vanessa Delgado		
Mentor:	Dr. Linda Heidenreich		**Honors:** No
Co-Authors:			
Presentation Type:	Poster	**College:** College of Arts and Sciences	**Major:** Sociology
Category:	Social Sciences		

ABSTRACT:

This study focuses on five domestic violence agencies' ability to address Latina women's needs. Because of demographic shifts and growth from the Latino community, it is important to address if the services are following the demographic changes. This study assesses the services currently available in the Pacific Northwest, how those services were developed and how Latinas are/are not able to access those services. This study is to determine the relationship that domestic violence has to Latinas and the ability of agencies, in the Northwest, to meet the needs of Latinas. This study is geared towards understanding the availability of services that serve these particular women as well as mapping areas where services can be improved. There will be a close examination of how and if the domestic violence services and agencies adequately serve the Latino community and how the Latina women can create resistance against the violence in their communities.

Presentation Number 35

Abstract Title:	**Nondestructive Rapid Sensing for Reducing Post-Harvest Potato Storage Losses**		
Presenter:	Ashley Almaguer		
Mentor:	Lav R Khot		**Honors:** No
Co-Authors:	Jessica Tufariello, Lav R Khot, Dennis A Johnson, Herbert H. Hill Jr.		
Presentation Type:	Poster	**College:** College of Engineering and Architecture	**Major:** Mechanical Engineering
Category:	Engineering and Physical Sciences		

ABSTRACT:

Soft rot due to bacterial infection of tubers during storage cause considerable (about 6% produce losses annually) economic losses to potato growers. When potatoes are kept in bulk storage, the infected tubers can spread the rot rapidly to surrounding tubers. These and other volatiles rot storage and pose a health hazard. Thus, there is an urgent need to detect the soft rot early on using a nondestructive rapid sensing technique. Therefore, we have successfully evaluated the feasibility of using commercial ion mobility spectrometry to detect volatiles associated with both healthy and soft rotting potatoes kept at controlled temperature and humidity storage conditions. Overall, the technique has shown promising results and further detailed studies are needed to critically evaluate this approach of sensing to reduce potato storage losses.

Presentation Number 36

Abstract Title:	**Bacteria Conjugation Efficiency in the Presence of sub-Minimal Inhibitory Concentration Levels of Ceftiofur or Florfenicol in a Soil-Water Environment**		
Presenter:	Daniel Mobley		
Mentor:	Dr. Douglas Call		**Honors:** No
Co-Authors:	Lisa Orfe, Douglas Call		
Presentation Type:	Poster	**College:** College of Veterinary Medicine	**Major:** Biochemistry with Molecular Biology option
Category:	Molecular, Cellular, and Chemical Biology		

ABSTRACT:

In the U.S. the total mass of antibiotics used in veterinary medicine exceeds the total used in human medicine by 4-fold. Even though the impact on antibiotic resistance is not presently clear, some have argued that even low-doses of antibiotics, which are often used to boost animal growth by including in-feed antibiotics, will have biological effects such as inducing the transfer of resistance genes between strains and different species of bacteria. If true, this might represent an important pathway by which zoonotic pathogens acquire antibiotic resistance. To test the hypothesis that low-dose antibiotic exposure induces increased horizontal transmission of resistance genes, we evaluated the conjugation efficiency (the exchange of genetic material) of a known multi-drug resistant plasmid when exposed to sub-minimal inhibitory concentrations (sub-MIC) of either florfenicol or ceftiofur antibiotics in a soil-water slurry environment.

The plasmid donor strain of *Escherichia coli* (AR060302) is resistant to florfenicol and ceftiofur, while the recipient bacterium, *E. coli* K12, is nalidixic acid-resistant. When bacterial conjugation occurs, the K12 population acquires resistance to florfenicol and ceftiofur. The MIC_{100} for K12 is normally 8 µg/mL and 16 µg/mL for ceftiofur and florfenicol, respectively. Each experiment is conducted in a glass Petri dish where 10.0 g of sand is mixed with 4.0 mL of water with or without 2.0, 1.0, 0.50, or 0.25 µg ceftiofur/g sand or 1.0, 0.50, 0.25, or 0.125 µg florfenicol/g sand. After 24 hr incubation (37°C) the bacteria were recovered by shaking a 5.0 g slurry sample at 200 rpm for 30 min in 2.5 mL of phosphate buffered water. The conjugates were then selected on agar plates containing 30 µg/mL nalidixic acid and either 16 µg/mL florfenicol or 8 µg/mL ceftiofur. Experiments were replicated. The rate of conjugation, which is expressed as a ratio of the number of conjugates to the number of donors, ranged from $1.56*10^{-6}$ to $3.03*10^{-7}$ for ceftiofur and florfenicol, respectively, and there was no evidence of a dose-effect. The results from this experiment show no evidence that the rate of conjugation of a multidrug resistance plasmid changes in the presence of sub-MIC levels of antibiotics.

Presentation Number 37

Abstract Title:	**Deliberate Destruction of Art and Culture: Iconoclasm in Afghanistan**		
Presenter:	Alison Mand, Sarah Rausch		
Mentor:	Pamela Lee		**Honors:** Yes
Co-Authors:	Carly Campbell, Sarah Rausch		
Presentation Type:	Poster	**College:** College of Arts and Sciences, College of Engineering and Architecture	**Major:** English, Electrical Engineering
Category:	Humanities		

ABSTRACT:

The Taliban destroyed two colossal ancient Buddha statues in 2001. These were globally treasured monuments located in the Bamiyan province of Afghanistan. This act of iconoclasm inspired our examination of the rich Afghan art history, how iconoclasm and the Taliban threatened it, and the global effort to restore and protect Afghan heritage.

We will discuss the flow of cultures, religions, and peoples through Afghanistan from ancient times to today, focusing on how this history influenced the art and architecture of the country's inhabitants. The influence of the Greeks and Persians on Buddhist art is especially significant as their contributions led to the construction of the Bamiyan Buddhas. Major religious influences, including Zoroastrianism, Hinduism, and Buddhism will be addressed, leading to a discussion of the emergence of Islam, which spread quickly, introducing a set of beliefs which led to iconoclastic tendencies among some Muslims.

The Taliban of Afghanistan were not the first to inflict damage on the country's rich heritage. Afghanistan's art and archaeological remains have been victims of incomprehensible damage over centuries in the form of religious iconoclasm, looting, and negligence. However, in 2001, the Taliban embarked on a destructive spree that would surpass any level of damage yet inflicted. The paper examines how the Taliban came to be in power, the political context of their regime, their religious ideology, and how these put the Taliban in a position to destroy a huge portion of the country's invaluable art in a matter of days without any formal repercussions.

By 2002, the Taliban regime was subdued. Since then, UNESCO and other internationally collaborative teams have entered Afghanistan on cultural missions. The archaeological excavations developed with the resurgence of local culture and revealed a plethora of new information about the art history of the region. Our analysis of this process incorporates the progression of current events in Afghanistan and the ongoing restoration of cultural heritage. This leads us to a final discussion on the relevance of art in culture, and why art is so highly regarded in historical and personal narratives.

Presentation Number 38

Abstract Title:	**Synthetic Studies of New Ligands for 'Click' Chemistry**		
Presenter:	Chen Jen Hsu		
Mentor:	Jonel Saludes		**Honors:** No
Co-Authors:	Dhananjaya Sahoo; Jonel Saludes		
Presentation Type:	Poster	**College:** College of Arts and Sciences	**Major:** Chemistry
Category:	Applied Sciences		

ABSTRACT:

'Click' chemistry has played significant role as a quick and reliable strategy for bioconjugation. One of the most quintessential example of 'Click' chemistry, Copper-catalyzed azide-alkyne cycloaddition reaction (CuAAC), serves as useful tool for biological setting because it is highly specific and bio-orthogonal, enabling the tagging and visualization of biomolecules like proteins and nucleotides within live mammalian. However, CuAAC has several drawbacks including slow kinetics and cytotoxicity upon lone-term exposure of cells to the reaction mixture. A new generation of water-soluble ligand, called BTTAA, has alleviated some of these problems but its exact mechanism of function is not yet fully understood. To contribute to the understanding of BTTAA function and discover a new generation of CuAAC ligand, we are developing a small library of BTTAA derivatives by modifying its functional groups that are believed to be responsible for its ligand property. This paper shall report on our design and synthesis of BTTAA derivatives.

Presentation Number 39

Abstract Title:	**Studies on Grapevine Red Blotch Disease in Washington Vineyards**		
Presenter:	Jarrod Pack		
Mentor:	Dr. Naidu Rayapati		**Honors:** No
Co-Authors:	Basavaraj Bagewadi and Naidu Rayapati		
Presentation Type:	Poster	**College:** College of Agricultural, Human and Natural Resources	**Major:** Integrated Plants Sciences: Viticulture and Enology
Category:	Organismal, Population, Ecological, and Evolutionary Biology		

ABSTRACT:

Grapevine red blotch (Synonym: Red leaf) is a 'new' disease reported during the past couple of years in several grapevine-growing regions within the US. Grapevine red blotch-associated virus (GRBaV) has been implicated as a causal agent of red blotch symptoms. Because the red blotch has only been known for such a short time, there is much to be learned about its prevalence, spread, affects on grapevine productivity, fruit quality, and genetic diversity of the virus. The main objective of this project is to generate information on the distribution of the disease in vineyards and assess genetic diversity of GRBaV at the genomic level. For this purpose, leaf samples showing red blotch symptoms or suspected for red blotch symptoms were collected from wine grape cultivars in a few grower vineyards. Nucleic acids were extracted from these samples and tested by polymerase chain reaction (PCR) for the presence of GRBaV. Sequences specific to the coat protein and replicase gene were amplified by PCR, gel purified and ligated directly into a plasmid vector. The ligated products were introduced into chemically competent *Escherichia coli* via heat shock treatment and the plasmid DNA isolated from recombinant colonies was used for sequencing. The sequences were edited using bio-edit software and compared with corresponding sequences of GRBaV available in public databases to assess differences at the nucleotide level. The results will be presented for advancing our knowledge of GRBaV and the occurrence of red blotch disease in Washington vineyards.

Presentation Number 40

Abstract Title:	**Foster Youth in College and Associative Factors of College Success**		
Presenter:	Jeanette Perales		
Mentor:	Olusola Adesope		**Honors:** No
Co-Authors:			
Presentation Type:	Poster	**College:** College of Arts and Sciences	**Major:** Psychology
Category:	Social Sciences		

ABSTRACT:

Foster youth face severe adversity in going through the foster care process and losing access to services upon turning 18 years old. This contributes to this population being significantly underrepresented in college. To investigate resilience among foster youth, associative factors to college success were explored among 4 former foster youths attending Washington State University. Using data from semi-structured qualitative interviews, results indicated several factors associated with college success including minimizing placements, supportive role models, internal locus of control (personality), financial stability, academic support, social stability, extracurricular activities, and former foster youth college programs. An implication to this study suggests that although foster youth utilize certain resources to succeed, an internal locus of control and positive intrapsychic processes are most crucial for college success in this population. This is especially important in facilitating college entrance for more underrepresented individuals.

Presentation Number 41

Abstract Title:	**The Role of Transcription Factors HEB and E2A in Female Reproductive Tract Development and Postnatal Function**		
Presenter:	Michelle Chan		
Mentor:	Jim Pru		**Honors:** Yes
Co-Authors:	Cindy A. Pru, Jon M. Oatley, James K. Pru		
Presentation Type:	Poster	**College:** College of Agricultural, Human, and Natural Resources	**Major:** Animal Science
Category:	Molecular, Cellular, and Chemical Biology		

ABSTRACT:

Nearly 6.7 million women in the United States experience difficulty conceiving. Although infertility may stem from a variety of factors, congenital birth defects remain a major cause. By evaluating the molecular mechanisms involved in the development of the reproductive tract, we can better understand and counter the possible causes of infertility in adult women in the context of congenital defects. It is hypothesized that transcription factors encoded by the genes *E2a* and *Heb*, which are involved in cellular differentiation and tissue development in other systems, are functionally required for development of the female reproductive tract and postnatal uterine and ovarian function. E47, the protein product of the *E2a* gene, was dynamically and abundantly regulated in the uterus and ovary in response to steroid and gonadotropin hormones, respectively. At the time of embryo implantation, E47 transitions from a diffuse expression pattern in subluminal stromal cells to a robust nuclear pattern. Given the function of *E2a* and *Heb* protein products in differentiation, we suspect that these transcription factors are necessary for uterine decidualization, a postnatal developmental process required for successful pregnancy in invasively implanting species such as rodents and humans. E47 expression in the ovary is predominant in granulosa cells of the follicle, particularly near ovulation, a time when estrogen-producing granulosa cells differentiate into progesterone-producing luteal cells. The functional requirement of *E2a* and *Heb* for uterine pre- and postnatal development of the uterus and ovary was next assessed in transgenic mice using *Cre/loxP* technology. Here, each gene was conditionally deleted from the female reproductive tract during embryonic development. Our experimental efforts centered on deletion of *E2a* and *Heb* from the uterus and ovary. These mice were referred to as double conditional knockout (dcKO) mice. Histological analysis of uteri and ovaries from control and dcKO indicated that prenatal uterine and ovarian development is not disrupted by the deletion of *E2a* and *Heb*. However, preliminary data from our 6 month breeding trial suggests that dcKO female mice have reduced fecundity in comparison to control animals. Our research efforts provide an initial clue that *E2a* and *Heb* are necessary for fertility in the female.

Presentation Number 43

Abstract Title:	**Testing Biotic Factors Effects on Northern House Mosquito Fitness**		
Presenter:	Kristem Wedam		
Mentor:	Dr. Jeb P. Owen		**Honors:** Yes
Co-Authors:	Amanda Meadows, Kelsey Withrow, Samantha Whiteside		
Presentation Type:	Poster	**College:** College of Agricultural, Human, and Natural Resources	**Major:** Animal Sciences
Category:	Organismal, Population, Ecological, and Evolutionary Biology		

ABSTRACT:

The northern house mosquito (NHM), *Culex pipens pipiens,* is a widespread blood-feeding insect that transmits a diversity of harmful parasites to people and animals. The parasites include viruses, protozoa and filarial worms. In all cases, transmission increases with longer lived mosquitoes and at higher mosquito densities. The biotic factors that shape NHM longevity and fecundity remain unclear. For other mosquito species, it is known that larger body size increases longevity and host differences affect mosquito fecundity. We tested two hypotheses related to these observations to better understand biotic controls of NHM fitness: (H1) Longevity will increase with larger NHM body size; (H2) Host birds with repeated mosquito exposure will acquire defenses that reduce NHM fecundity. In contrast to studies of other mosquito species, we found that NHM body size did not correlate with survival. We observed that the number of female mosquitoes produced per host was higher when the host was naïve, and this value varied less in the naïve bird group than in the exposed bird group. The average proportion of larvae that pupated was slightly higher for the naïve host group and this value also varied less in the naïve host group than in the exposed host group. Our data indicate that host exposure can affect fitness of NHM, which shapes the risk of parasite transmission by these blood feeding arthropods.

Presentation Number 44

Abstract Title:	**Interdisciplinary and Collaborative Work: How to Work More Efficiently for Better Project Outcomes**		
Presenter:	Kelsey Sybouts		
Mentor:	Kathleen Ryan		**Honors:** No
Co-Authors:			
Presentation Type:	Poster	**College:** College of Agricultural, Human, and Natural Resources	**Major:** Interior Design
Category:	Arts and Design		

ABSTRACT:

It might be elementary to say that in order to build and create effectively we must all work together for the outcome to be great. We lose sight of the basic idea that working together is beneficial for both colleagues and the project outcome.

Establishing habits for working collaboratively between multiple disciplines creates a better work environment and better project outcomes. In this project students from 3 design programs, Architecture, Interior Design and Landscape Architecture, collaborated on the design of a proposed rural community library located in Northern Idaho. The building structure, the interior spaces, and the surrounding landscape needed to blend seamlessly so the overall design of the Library's community center is cohesive, and fits within the community.

Collaborating with different disciplines benefits the project outcomes. An advantage for the rural community library is a better cultivated design supported by multiple ideas through various design fields. The individuals working together also profit from learning about different disciplines, creating professional connections, and a sense of self-worth through contribution.

To work effectively with other disciplines, the idea of exchange needs to be instilled into each colleague's work ethic; when everyone shares their knowledge it creates momentum for the entire project. In the design process, collaboration should be seen as an equal opportunity for each individual to showcase what they specialize best in. Students in this project kept time sheets, and reviewed their own performance in the team, as well as evaluated each other at two points in the project. Results indicated the necessity of personal responsibility to the project.

The challenge with interdisciplinary work in competing disciplines is communication. We learned that without regular meetings and constant communication, tension was created for the team. In order to have good communication, each group member must be active, and willing to meet and discuss the project. During these meetings, members need to be vocal, understanding, and listen to what others have to say. It becomes difficult to create a cohesive design when communication does not exist.

There are many methods to interdisciplinary collaboration. Instilling ideas of collaboration into individuals will produce positive outcome.

Abstract Title:	**Versatile Bifunctional Chelates for Generating Targeted $[^{99m}tc(CO)_3]^+$ Radiopharmaceuticals**		
Presenter:	Winston Slocumb		
Mentor:	Dr. Paul Benny		**Honors:** No
Co-Authors:	Ben Kasten, Tom Hayes		
Presentation Type:	Poster	**College:** College of Veterinary Medicine	**Major:** Biochemistry (biophysics)
Category:	Engineering and Physical Sciences		

ABSTRACT:

^{99m}Tc ($t_{1/2}$ = 6.0 h, γ = 140 keV (89%)) is the most widely used radionuclide in clinical diagnostic imaging applications. Due to its stability, small molecular volume, and versatile coordination chemistry, the $[^{99m}Tc(CO)_3]^+$ core is an attractive moiety in designing targeted radiopharmaceuticals. Bifunctional chelates (BFCs) are molecules which join a chelate for ^{99m}Tc to another molecule (e.g., targeting molecule, drug) to generate the final radiopharmaceutical. While specific chelates and labeling methods can be used to rationally influence the biological behavior (e.g., clearance, uptake at the biological target) of the resulting radiopharmaceuticals, exploration with some biomolecules has been hampered due to the harsh labeling conditions often used with $[^{99m}Tc(CO)_3]^+$. This project involves synthesizing new BFCs for ^{99m}Tc and exploring novel strategies to connect the chelates/complexes to biomolecules. Our *hypothesis* is that BFCs containing isothiocyanate groups and 2,2′-dipicolylamine moieties will readily react with free amines in a variety of biomolecules and will maintain coordination efficiency for $[^{99m}Tc(CO)_3]^+$. Two BFCs were synthesized for this project: 4-isothiocyanato-N,N-bis(pyridin-2-ylmethyl)butan-1-amine (**1**) and 6,6′-(((4-isothiocyanatobutyl)azanediyl) bis(methylene))dinicotinic acid (**2**). Both **1** and **2** utilize a standard tridentate chelate system with remarkable labeling efficiency and stability following complexation with $[^{99m}Tc(CO)_3]^+$. Substitution of carboxylic acids *meta* to the pyridinal nitrogens in **2** increases the hydrophilicity of this BFC and metal complex relative to **1**. These 2 BFCs are envisioned to allow researchers to "tune" the hydrophilic properties of $[^{99m}Tc(CO)_3]$-based radiopharmaceuticals as desired for specific applications. Following chelate synthesis and characterization, initial conjugation studies used lysine as a model for biomolecules. Re was used as a surrogate for ^{99m}Tc during characterization. Two strategies were explored: Strategy 1) first couple BFCs to lysine and then coordinate the metal to the chelator, and Strategy 2) first coordinate the metal to BFCs and then couple the resulting complexes to lysine. This work will present the results of the syntheses, metal complexation studies, and lysine coupling reactions using the two BFCs above.

Presentation Number 46

Abstract Title:	**Studies on Multimeric Cell Penetrating Peptides**		
Presenter:	Erin Adams		
Mentor:	Dr. Jonel P. Saludes		**Honors:** No
Co-Authors:	Erin V. Adams, I. Abrrey Monreal, Qian Liu, Hector Aguilar-Carreno, and Jonel P. Saludes.		
Presentation Type:	Poster	**College:** College of Arts and Sciences	**Major:** Chemistry
Category:	Molecular, Cellular, and Chemical Biology		

ABSTRACT:

Delivery of therapeutics across the cell membrane poses a significant challenge, which once overcome, would allow new avenues for improving treatments using existing drugs and potentials for treating intracellular disease targets. Some examples of applications include gene therapy and targeted apoptosis of cancer cells. Anchoring drugs on cell penetrating peptides (CPPs), which are capable of translocating cargoes across cell membranes, can be a powerful intracellular delivery strategy. Current CPPs still face limitations due to low translocation efficiency and target specificity. Various approaches have been investigated to maximize uptake, including linear oligomers and polymer supported designs, that have shown promising results but still possess deficiencies such as linear length efficiency caps, still-limited cell penetration, or high complexity. We hypothesize that increasing the local concentration of CPPs through a multimeric design would increase cell uptake and improve kinetics. To test our hypothesis, we used the transduction domain of HIV-Tat protein (Tat peptide), an established CPP, as our model because the cell permeability properties of multimeric Tat peptide have not been previously investigated. The monomer and dimer of Tat peptide were prepared using microwave-assisted solid phase synthesis followed by conjugation to a fluorophore. The peptides were tested for cell permeability against HeLa cells at varying concentrations and analyzed by fluorescence activated cell sorting. Herein we report the findings of our investigations and demonstrate the viability of a multimeric CPP construct as efficient intracellular carrier.

Presentation Number 47

Abstract Title:	**Enhancing Neurodiversity at WSUV**		
Presenter:	Lindsay Prager		
Mentor:	Dr. Dana Lee Baker		**Honors:** No
Co-Authors:			
Presentation Type:	Poster	**College:** College of Arts and Sciences	**Major:** Social Sciences
Category:	Social Sciences		

ABSTRACT:

Students with neurodiversities experience a number of difficulties regarding inclusion in higher education. Typical students also encounter many of these same problems. This paper explores the notion that facilitating a more inclusive environment for neurologically diverse students will also enhance the learning experiences of students who are not diagnosed with a learning disability. Humans are a heterogeneous species, with learning styles varying greatly from person to person; therefore, no one teaching style is most effective. Incorporating multiple learning styles and teaching techniques will enhance higher education experiences for all students. The data outlined in this article will originate through surveys of a collegiate community and literature review in order explore what practices would be most constructive to the learning environment for all students. This paper demonstrates that the current policies surrounding inclusion of students with neurodiversities in higher education need to be reevaluated in order to provide all students higher quality education and learning experiences.

Presentation Number 48

Abstract Title:	**Fish Skull Biomechanics and Developmental Changes in Form, Function and Ecology.**		
Co-Presenters:	Kangni Ekoue-totou and Holly Milewski		
Mentor:	Dr. W. James Cooper		**Honors:** No
Co-Authors:	Kangni Ekoue-totou, Holly Milewski, Regan Volk, Dr. W. James Cooper		
Presentation Type:	Poster	**College:** College of Arts and Sciences	**Major:** General Biological Sciences
Category:	Organismal, Population, Ecological, and Evolutionary Biology		

ABSTRACT:

The pinfish (Lagodon rhomboides) is a common inhabitant of shallow waters in the Gulf of Mexico and the Southern Atlantic Coast of the United States. Hatchling pinfish drift in the water column and feed on small zooplankton, such as copepods, that they engulf whole. Upon reaching 1.5-2.0 cm in length, young pinfish leave the water column and move down into seagrass meadows where they feed on small, bottom-dwelling invertebrates such as amphipods. They capture these preys by seizing them with their teeth. Adult fish become herbivores that bite pieces out of seagrass leaves. These developmental shifts in feeding ecology are accompanied by changes in skull shape that alter the biomechanics of biting. These developmental changes in shape have important biomechanical consequences. Pinfish of different ages are therefore able to eat different foods and occupy separate ecological niches. Pinfish were collected from trawls in seagrass meadows in the Northern Gulf of Mexico offshore from The Florida State University's Turkey Point marine lab. 140 specimens ranging in size from 1-15 cm were fixed in formalin and preserved in 70% ethanol. Their heads were dissected to expose aspects of anatomy that are of biomechanical importance to feeding. All specimens were then photographed and digital images were examined using shape analyses. The X,Y coordinate locations of functionally important anatomical landmarks were established for each image. These data were then used to determine how the relative positions of the landmarks shift over the course of development.

Presentation Number 49

Abstract Title:	**Nuclear Waste Reprocessing through Cyanex-923 and HEH[EHP] Solvent Extraction**		
Presenter:	Joel Alvarez		
Mentor:	Kenneth Nash		**Honors:** No
Co-Authors:	Aaron Johnson, Kenneth Nash		
Presentation Type:	Poster	**College:** College of Arts and Sciences	**Major:** Chemistry
Category:	Engineering and Physical Sciences		

ABSTRACT:

Long term storage of used nuclear fuel has proven to be difficult due to the varying chemistries involved as well as the long-term radiotoxicity of the fuel. To avoid this dilemma, a simpler, reliable and cost effective reprocessing method needs to be developed for use in the U.S. and around the world. Since Fall 2011, I have aided Aaron Johnson (a graduate student in Professor Kenneth Nash's research group) in researching a nuclear waste recycling system. This system utilizes a combined extractant process and can possibly be used to avoid long term storage of use nuclear fuel. This study focuses on gaining an understanding of the molecular interactions between the mixture of extractants (Cyanex-923 and HEH[EHP]), HNO_3 and water in this system. The results of this experiment calculated an equilibrium constant for the extraction of HNO_3 by Cyanex-923 to be 15.24 ($\pm$0.82). This value is in good literature agreement with similar systems. FT-IR spectroscopy was used in tandem with the equilibrium constant determinations and supports the findings. Karl-Fischer titrations were also used to determine total organic phase water content. Through the data derived in these studies, total molecular speciation in the organic phase could be determined. These results also show that with additional research a plausible use of this system may be for nuclear waste recycling.

Presentation Number 50

Abstract Title:	**Root Rot of Pea Caused by Rhizoctonia Solani Anastomosis Group (AG)-8: Yield Loss and Screening for Resistance**		
Presenter:	Edward Thomas		
Mentor:	Dr. Timothy C Paulitz		**Honors:** No
Co-Authors:			
Presentation Type:	Poster	**College:** College of Agricultural, Human, and Natural Resources	**Major:** Agricultural Biotechnology
Category:	Organismal, Population, Ecological, and Evolutionary Biology		

ABSTRACT:

Stunting of pea caused by *Rhizoctonia* spp. is one of the soil-borne diseases in the Columbia Basin of Oregon and Washington States. The disease is more severe in fields where cereal cover crops are incorporated into the soil prior to planting pea seed. *Rhizoctonia* spp. colonize the cereal roots and infect pea seedlings. A survey was conducted in a field of severely stunted peas near Basin City, WA. Ten patches of stunted peas were flagged in the first week of June. Manual harvest of peas was done inside each flagged patch (1 m^2) a month later. Harvest also was done from an adjacent healthy area next to each patch to estimate yield loss from stunting. Stunted patches in the pea field incurred a 75% yield loss compared to adjacent healthy areas. A set of 32 pea lines/cultivars was inoculated with *R. solani* AG-8 to identify lines/cultivars with tolerance or resistance to the pathogen, using a randomized complete block design under greenhouse conditions. Plant height and root rot severity (1 to 9 scale) were evaluated four weeks after inoculation. The reduction in plant height caused by *R. solani* AG-8 averaged 35±12% and ranged from 4 to 59% compared to non-inoculated control plants of the 32 pea cultivars. The cultivar 'Franklin' had the least reduction (4%) in plant height followed by Bohatyr (16%), Spectes (21%), Carousel (22%), Aragorn and Universal (24%), and Toledo and Marjoret (25%). Root rot severity rating averaged 6±0.88 ranged from 4 to 7. The least severe root rot (4) was observed for Aragorn, Columbian Franklin, and Melrose. These findings show the importance of stunting of pea caused by *R. solani* AG-8, and identify pea lines with potential tolerance or resistance to the pathogen.

Presentation Number 51

Abstract Title:	**The Role of Gossip in Human Cooperation on a College Campus**		
Presenter:	Caity Ellesmere-Jones		
Mentor:	Luke Premo		**Honors:** No
Co-Authors:			
Presentation Type:	Poster	**College:** College of Arts and Sciences	**Major:** Anthropology
Category:	Social Sciences		

ABSTRACT:

Previous research has shown that most conversations are devoted to social topics, known simply as "gossip," and that this use of language may facilitate the high levels of cooperation that are characteristic of humans. For example, Robin Dunbar categorized public conversation topics into broadly defined categories: social, politics, sports, music and culture, and technical. He found that approximately 2/3 of conversation time was spent discussing social topics rather than technical know-how. Dunbar was surprised that naturally occurring conversations were dominated by social topics. I attempted to replicate his study on the Washington State campus in the Compton Union Building. Using a random sample of university students, I listened to groups' conversation topics in various areas of the CUB and recorded the general topic discussed at 1-minute intervals. I categorized conversation topics as social, technical, or miscellaneous (politics, culture, sports, etc.). I found that people spent the most time talking about social topics. However, I found women tended to gossip more so than men about topics pertaining to romantic relationships, social life, and personal life, and that their conversations more often included information that seemed to be meant to affect the reputation of the subject of the discussion. It seems that women used conversations to "police" behaviors they found deviant from the norm more often than men did. Men spent most of their time talking about social and miscellaneous topics. Where my findings do not match Dunbar's, various reasons may be to blame. Perhaps the "policing" aspect of conversation was under-represented in my sample because people are less comfortable gossiping in a public place today than 20 years ago. Perhaps new forms of communication (texting, social media, etc.) that were not present when Dunbar conducted his original study play a role as well, and this may provide an interesting avenue for future research. While gossip has a bad reputation, it has become an integral part of human conversation, perhaps because it helps facilitate cooperation. My results suggest that there may be substantial differences in the ways that men and women use conversation to this end.

Presentation Number 52

Abstract Title:	**Polymelia in Holstein Cattle**		
Presenter:	Kelsey Moss		
Mentor:	Holly Neibergs		**Honors:** No
Co-Authors:	F. Avila, T. Raudsepp, B.M. Marron, J.E. Beever, M. Neupane, S. Parish, J. Kiser, B. Cantrell, H.L. Neibergs		
Presentation Type:	Poster	**College:** College of Agricultural, Human, and Natural Resources	**Major:** Animal Science
Category:	Molecular, Cellular, and Chemical		

ABSTRACT:

Polymelia is a congenital condition where an animal has more than the normal number of limbs. Previous reports have suggested that polymelia is due to abnormal chromosomal breaks or to a mutation that segregates in Angus cattle. A male Holstein calf presented to the WSU Veterinary hospital with scoliosis, a deviated tail, and two additional front legs originating from each scapula. The objective of this study was to determine if polymelia in this Holstein calf was due to the mutation identified in Angus cattle, a gross chromosomal abnormality or another genetic cause. A 10 ml blood sample was taken to prepare a karyotype of the calf to identify chromosomal abnormalities and for DNA extraction for genotyping. Genotyping of this Holstein calf for the specific mutation present in Angus cattle was performed using a PCR-RFLP technique. Genotypes were also obtained from the Holstein calf using the Illumina bovine HD BeadChip. A genome wide association study (GWAS) was conducted with the polymelia calf compared with 2800 control Holstein calf samples. The statistical approach used for the GWAS was EMMAX (Efficient Mixed-Model Association eXpedited). GWAS data underwent quality control filtering for minor allele frequency (<1%), SNP call rate (<95%), and animal call rate (removal of animals with less than 95% of SNPs called). Population stratification was tested for ($lambda_{GC}$) prior to GWAS analysis. Loci associated with polymelia were found to be associated when $P<1x10^{-50}$. The karyotype results showed no evidence of increased levels of chromosomal breaks in the Holstein calf. The PCR-RFLP genotype of the Holstein calf was consistent with a normal Angus animal. Furthermore, sequencing of the gene mutated in Angus cattle revealed no additional polymorphisms that might cause the polymelia phenotype. No population stratification was identified ($lambda_{GC}=1.04$) in the Holsteins genotyped by the Bovine HD SNP assay. The GWAS association analysis identified three loci associated with polymelia: one locus on BTA13 ($P<1x10^{-281}$), BTA10 ($P<2x10^{-110}$) and BTA20 ($P<2x10^{-52}$). These results suggest that polymelia is due to more than one locus and mutations causing polymelia are not shared across breeds.

Presentation Number 53

Abstract Title:	**In the Name of the State: Bonapartism and the Foreign Policy of the Second French Empire**		
Presenter:	Brian Cieslak		
Mentor:	Dr. Steven D. Kale		**Honors:** No
Co-Authors:	NA		
Presentation Type:	Poster	**College:** College of Arts and Sciences	**Major:** History
Category:	Humanities		

ABSTRACT:

While historians have examined the foreign policy of the Second French Empire from a number of different angels, studies seeking to understand ideology's role in Napoleon III's diplomacy have not been forthcoming. Utilizing a variety of primary and secondary sources, this study examines the relationship between ideology and the politics of the Crimean, Franco-Austrian and Franco-Prussian Wars, in order to find out how political ideologies influenced the diplomacy of Napoleon III, so that we may form a better understanding of the Second French Empire's foreign policy.

Presentation Number 54

Abstract Title:	**The Involvement of Supra Spinal and Spinal Adrenergic Pathway in Hyperbaric Oxygen (HBO2)-Induced Antinociceptive Effect**		
Presenter:	Joel Church		
Mentor:	Dr. Raymond Quock		**Honors:** No
Co-Authors:	Yangmiao Zhang, Donald Y. Shirachi, Raymond M. Quock		
Presentation Type:	Poster	**College:** College of Veterinary Medicine	**Major:** Microbiology
Category:	Molecular, Cellular, and Chemical Biology		

ABSTRACT:

HBO_2 can produce relief to acute pain (Chung et al. *J. Pain* 11:847, 2010). We have previously reported that the antinociceptive effect of HBO_2 was reduced by Intracerebroventricular (i.c.v.) administration of an a_2 adrenergic receptor antagonist Yohimbine in saline solution (Dupic et al. *FASEB*, 2012). However, there were concerns that saline might disturb the balance of the cerebral spinal fluid (CSF) and alter the effect of HBO_2. (Heeman et al. *Brain Res*, 2013). The aim of this study was to ascertain the role of Yohimbine prepared in artificial CSF (aCSF) in the brain and the spinal cord in HBO_2-induced antinociception. Male NIH Swiss mice were pretreated i.c.v. or intrathecally (i.t.) with Yohimbine or aCSF. Twenty-five min later, mice received 0.6% acetic acid injection intraperitoneally. Immediately after the injection, mice were placed in the hyperbaric chamber, which was then compressed to 3.5 atmospheres absolute with 100% oxygen. Exactly 5 min after, the numbers of constrictions from the mice were counted for 6 mins while they were in the chamber. The results showed that despite aCSF producing a certain degree of antinociception itself, both i.c.v. and i.t. administered Yohimbine reduced HBO_2-induced antinociceptive effects in a dose-dependent manner. These results demonstrated that both supraspinal and spinal a_2 adrenergic receptors are involved in HBO_2-induced antinociceptive effect. (This research was supported by NIH Grant AT-007222 and the Allen I. White Distinguished Professorship at Washington State University).

Presentation Number 55

Abstract Title:	**Increasing the Power Output of The Cdte Solar Cell via a Novel Luminescent Down-Shifting Molecule: Synthesis, Photophysical Studies and Application**		
Presenter:	Joseph Olsen		
Mentor:	Wen-Ji Dong		**Honors:** No
Co-Authors:	Yilin Li, Wen-Ji Dong		
Presentation Type:	Poster	**College:** College of Engineering and Architecture	**Major:** Bioengineering
Category:	Engineering and Physical Sciences		

ABSTRACT:

The cadmium telluride (CdTe) solar cell is considered one of the most promising photovoltaic (PV) technologies for a significant portion of the PV market in the future because of its low-cost and easy-manufacturing conpared to the traditional crystalline silicon (c-Si) solar cell. However, the spectral response of the CdTe solar cell exhibits weak response to the short-wavelength region (< 500 nm) in the solar spectrum, where only less than 20 % incident photons can be converted into effective current. Despite numerous researches on solving the weak short-wavelength response on a cell structure level, a more creative approach is to modify the incident light without changing the cell structure. A luminescent down-shifting (LDS) film is placed on the cell front surface, in which the LDS molecules can absorb short-wavelength photons (< 500 nm) and emit long-wavelength photons (> 500 nm) that are more favorable for the CdTe solar cell. In this research, a novel LDS molecule (P-TPE) containing the conjugated structure of perylene and tetraphenylethylene has been synthesized by multi-step synthesis including bromination, condensation, elimination, substitution and Palladium-catalyzed coupling reactions. Its specific photophysical properties have been characterized by spectroscopic measurements such as UV-Vis absorption, fluorescence spectrum and time-resolved lifetime, exhibiting absorption at 448 nm and emission at 520 nm with high quantum yield (near 1.00) in the solid state. Quantum chemical theoretical computation using density functional theory (DFT) and time-dependent DFT (TD-DFT) has been performed. The calculation results were consistent with the experimental results, which provides evidences showing that such specific photophysical properties are related to the molecular configuration and electronic conformation in both ground and exicted states. Furthermore, LDS films has been prepared by doping P-TPE molecules into poly(methylmethacrylate) (PMMA). Primary theoretical examination by using a theoretical LDS process model indicated that the LDS films can increase the output short circuit current density (J_{sc}) of the CdTe solar cell by over 10 %. The increase in J_{sc} was due to the enhanced short-wavelength response by calculating the external quantum efficiency (EQE) of the cell. Further application on using P-TPE to fabricate luminescent solar concentrator (LSC) has also been investigated.

Presentation Number 56

Abstract Title:	**Bookmarks to Encourage a Healthy Breakfast**		
Presenter:	Kendall Robinson		
Mentor:	Sandra Brown		**Honors:** No
Co-Authors:			
Presentation Type:	Poster	**College:** College of Agricultural, Human, and Natural Resources	**Major:** Human Development
Category:	Social Sciences		

ABSTRACT:

The Expanded Food and Nutrition Education Program (EFNEP) has been in schools doing the Food Safety and Nutrition Programs for 44 years. An EFNEP educator goes into schools that 50% or more of its students participate in the free or reduced lunch program. The EFNEP focuses on helping families and youth improve behaviors in the following areas: dietary intake as recommended by MyPlate, food resource management skills and practices, nutrition practices and food safety practices.

"Bookmarks to Encourage a Healthy Breakfast" Program was introduced following the six-week nutrition education series. Week one, lesson one of the bookmark project; the children recalled the previous nutrition lessons through class discussion. They were asked a series of question pertaining to their own personal breakfast habits. Than they were able to create their own breakfast inspired bookmark.

Week two, lesson two; the children were asked the same series of questions which resulted in the collection of data shown. The children were then able to present their bookmarks "loud and proud" to their fellow classmates. The bookmarks were sent home with the students in hopes to help educate the whole family on choosing a healthier, more balanced breakfast. The project clearly shows the benefits of the EFNEP nutrition series through the increase in the number of students that ate breakfast by 30%. The data provided indicated that over 50% of children were eating breakfast outside of the home either at a daycare or the school. This shows we desperately need parent involvement. Providing healthy foods and modeling good breakfast habits is vital if we want to continue on the uphill trek.

Presentation Number 57

Abstract Title:	**Vertical Gastric Sleeve Surgery in Lean Rats Implicates Plastic Changes in Feeding Centers of the Hindbrain while Effects of Fat Accumulation may play a Smaller Role**		
Presenter:	Lindsey Ballsmider		
Mentor:	Krzysztof Czaja		**Honors:** No
Co-Authors:			
Presentation Type:	Poster	**College:** College of Veterinary Medicine	**Major:** Neuroscience
Category:	Organismal, Population, Ecological, and Evolutionary Biology		

ABSTRACT:

Vertical gastric sleeve (VGS) surgery for weight loss is an effective treatment for severe obesity. Multiple studies have revealed decreased total fat mass, body weight and food preferences in obese rats after VGS surgery. However, the mechanisms underlying the effects of VGS on body fat accumulation and weight loss are unclear. Therefore, the goal of our study was to determine if reduced body weight after VGS surgery is due to changes in body fat accumulation, food preference and decreased weight gain. Moreover, we tested the hypothesis that VGS surgery will alter gut-brain communication. Lean male Sprague Dawley rats were used in the study. Six rats underwent VGS surgery while the second cohort of 6 rats was sham-operated. The body weight and caloric intake were measured every other day. A two-bottle test was performed to determine sucrose preference. To assess the preference for low calorie foods, rats were offered low-calorie and high-calorie diet simultaneously and preference scores were calculated. The Dual-energy X-ray Absorptiometry (DEXA) technique was used to measure the body fat mass. A neuronal tracer Fast Blue (FB) was used to address the changes in gut-brain communication. Immunofluorescence against Iba1 was used to reveal inflammatory response in hindbrain centers responsible for food intake. Isolectin-4 was used to reveal hindbrain plasticity after VGS. Results revealed that sham-operated rats regained pre-surgery weight after 2 days while VGS rats needed 18 days to regain pre-surgery weight. During the post recovery period there were no statistically significant differences in the daily % of body weight gain, daily caloric intake and body fat % between the studied groups. There was no difference in sucrose and low calorie preference between VGS and sham-operated rats. VGS surgery did not change the number of neurons innervating the stomach. However it increased the density of vagal afferents in the hindbrain. The difference in body weight in rats after VGS compare to sham-operated controls was mainly due to reduced caloric intake in the first stage of surgical recovery. The observed hindbrain plasticity was an effect of sprouting of injured vagal afferent neurons.

Presentation Number 58

Abstract Title:	Valid reference gene selection for quantitative real-time PCR analysis in *Tetranychus urticae* Koch (Arachnida: Acari: Tetranychidae)		
Presenter:	Danielle Jackson		
Mentor:	Laura Lavine		**Honors:** No
Co-Authors:			
Presentation Type:	Poster	**College:** College of Arts and Sciences	**Major:** Anthropology
Category:	Molecular, Cellular, and Chemical Biology		

ABSTRACT:

The two-spotted spider mite, *Tetranychus urticae* Koch is a world-wide agriculture super pest that can feed on > 1,100 plant species in more than 140 families. In the western USA, some perennial specialty crops, such as hops, peppermint, almonds, and strawberries are plagued by spider mite infestations. Typically growers apply inexpensive disruptive pesticides to suppress spider mite populations. Unfortunately spider mites have been shown to quickly develop tolerance and/or resistance to these chemicals which cause control failure. In order to design the most effective and sustainable spider mite management tactics, the long-term goal in the Lavine lab is to reveal the molecular mechanisms underlying the chemical adaptation of two-spotted spider mites. To achieve this goal, molecular methods have been developed for identifying the presence of resistance genes within specific populations of mites. Quantitative real-time PCR (qRT-PCR) is an extensively used method to analyze transcriptional expression of genes involved in resistance. An appropriate normalization strategy with a reliable reference gene is required for analyzing differential gene expression across different populations under experimental conditions. In my study, I aim to evaluate and identify the best reference gene(s) for qRT-PCR analysis in *T. urticae*. I chose eight commonly used genes as candidate references and two *T. urticae* cytochrome P450 monoxygenases as target genes. The qRT-PCR data for these genes will be from three developmental stages (egg, nymph and female adults) and four populations (susceptible, abamectin-resistant, bifenazate-resistant, and bifenthrin-resistant populations). The stability of the candidate reference genes will be assessed with two Excel-based algorithms, geNorm and NormFinder. My results will serve as the basis for the molecular and functional genomics research in this notorious agricultural pest.

Presentation Number 59

Abstract Title:	**Preparation and Analysis of New Hydrogen Sulfide Donors**		
Presenter:	Powell Bagdon		
Mentor:	Ming Xian		**Honors:** No
Co-Authors:			
Presentation Type:	Poster	**College:** College of Arts and Sciences	**Major:** Chemistry
Category:	Engineering and Physical Sciences		

ABSTRACT:

Hydrogen sulfide (H_2S) is a newly recognized signaling molecule with very potent cytoprotective actions. However, the research on H_2S has been hindered by the lack of controllable H_2S releasing agents, i.e. H_2S donors, which could mimic the slow and continuous H_2S generation process *in vivo*. Since geminal dithiols (*gem*-dithiols) are unstable and C-S bond can be easily broken under certain conditions, we envision that *gem*-dithiol compounds are potential H_2S donors and structural modification could regulate rate/capability of H_2S release from these donors. We have synthesized and evaluated several types of *gem*-dithiol based H_2S donors. In this presentation, our progress in this field will be discussed.

Presentation Number 60

Abstract Title:	**Occurrence of Mycotoxins in Light Vs. Dark Peanut Kernels**		
Presenter:	Nicholas Rivera		
Mentor:	Dojin Ryu		**Honors:** No
Co-Authors:			
Presentation Type:	Poster	**College:** College of Agricultural, Human, and Natural Resources	**Major:** Food Science
Category:	Applied Sciences		

ABSTRACT:

Mycotoxins are toxic secondary metabolites produced by various fungal species, and can be present in a wide range of food and feed. Mycotoxins are considered to be important due to their potential to cause adverse health effects in animals and humans. Contamination of peanuts with mycotoxins, particularly aflatoxins and ochratoxins, is a worldwide problem that affects both food safety and agriculture. The overall purpose of this study was to investigate the relationship between the color of peanut kernels and the occurrence of mycotoxins. Five peanuts samples were collected from various locations and kernels were separated by surface color based on visual perception (light *vs.* dark). The concentrations of mycotoxins were tested using an enzyme linked immunosorbant assay (ELISA), with the ratio of kernels to skins being 49:1. Amongst the kernel samples, aflatoxin B_1 (AFB_1) was not detected in any of light or dark samples. Ochratoxin A (OTA) was detected in two of the five dark kernel samples with concentrations ranging from 0.3 to 1.2 ppb and was not detected in any of the light samples. Both OTA and AFB_1 were detected in all of the light and dark skin samples. AFB_1 contamination levels of skin samples ranged from 54 to 98 ppb. OTA contamination levels of skin samples ranged from 30 to 84 ppb. This study shows that there is no difference in mycotoxin contamination between light and dark kernel samples. Peanuts have high levels of polyphenols particularly in the skin, which are known to exhibit antioxidant properties. It is inferred that the occurrence of OTA and AFB_1 in the peanut skins are in result of structurally similar polyphenolic compounds that emulate these mycotoxins structure, thus rendering a false positive.

Presentation Number 61

Abstract Title:	**In Defense of Democracy: Pursuing the Image of a Free and Democratic Taiwan in Politics and Media in the 20th Century**		
Presenter:	Joshua Falce		
Mentor:	Lydia Gerber		**Honors:** No
Co-Authors:			
Presentation Type:	Poster	**College:** College of Arts and Sciences	**Major:** History
Category:	Social Sciences		

ABSTRACT:

Since 1949 relations between the United States, the People's Republic of China, and the Republic of China on Taiwan have been complex. In 1979 the US changed its position from recognizing Taiwan to recognizing the PRC as the only legitimate government of China; the U.S. public however, did not quite follow suit. This project analyzes articles, editorials, and letters to the editor in three major U.S. newspapers, the *New York Times*, *Chicago Tribune*, and *Los Angeles Times*, during three periods of heightened complexity to examine how American public perceptions of Taiwan's role and identity shifted over time. The first period encompasses the Chinese Nationalists' withdrawal to Taiwan from 1949-55, which was accompanied by violent oppression of local opposition leading to decades of martial law. The second period relates to the U.S. switch from recognizing Taiwan to the PRC in 1979, which was closely followed by the Kaohsiung Incident, a strongly suppressed pro-democracy uprising. The third period centers on the 1995-96 Taiwan Strait Crisis, a period that finally promised the democratic institution that the Cold-War rhetoric of Taiwan as a "democratically against Red China" had implied decades earlier.

This project demonstrates that for almost five decades all three newspapers consistently downplayed or ignored evidence of political oppression on Taiwan, suggesting that support of global policy goals was more important than factual reporting. This project contributes to our understanding of the complex role of media in impacting public perception of international affairs.

Presentation Number 62

Abstract Title:	**Investigating Methylation Marks on Retrotransposed Sequences in Mouse Tissues**		
Presenter:	Fiorella Grandi		
Mentor:	Wenfeng An		**Honors:** Yes
Co-Authors:	James Rosser, Simon Newkirk, Wenfeng An		
Presentation Type:	Poster	**College:** College of Veterinary Medicine	**Major:** Biochemistry
Category:	Molecular, Cellular, and Chemical Biology		

ABSTRACT:

The human genome is composed of a variety of sequences; only 2% of these are protein-coding genes. Mobile elements, sequences that have the ability to move from one location in the genome to another, represent one-third of the human genome. They are a source of genetic variation but also mutagenesis that can result in genetic diseases or cancer. These detrimental effects are often repressed using methylation, a chemical modification on DNA that can be passed from cell to cell. Methylation of a sequence prevents its expression, thereby preventing mobile elements from moving.

Around the time of embryonic implantation, the genome undergoes a dramatic remodeling of the DNA methylation patterns in preparation for animal development, including patterns that will determine mobile element repression. In order to study the factors that influence and regulate the methylation of mobile elements, we use a transgenic LINE-1 (L1) model, the most abundant type of element in the mammalian genome. L1 is able to mobilize itself and other sequences via a "copy and paste" mechanism termed retrotransposition. We generated multiple insertions and tracked DNA methylation dynamics throughout mouse development.

Independent of genomic location, we observed contrasting L1 methylation profiles in somatic tissues and male germ cells (hyper- and hypomethylation, respectively) that persisted across generations. Detailed analysis of a full-length insertion sequence showed testicular hypomethylation was strongly correlated with CpG island length as well as the number of CpGs. Our findings suggest that the density of CpGs is a factor in determining which regions are recognized as CpG islands by the cell when a sequence is retrotransposed, therefore remaining unmethylated in the germline DNA. Such differential methylation may alter the epigenetic status of the flanking locus, eventually changing the epigenetic landscape of the genome. To determine if the observed differential methylation pattern is specific to sequences inserted into the genome through retrotransposition, we are currently collecting data from another type of mobile element, the Sleeping Beauty (SB) transposon that moves via a "cut and paste" mechanism. We hypothesize that sequence and mode of mobilization may play a role in determining the patterns of methylation SB transposed sequences.

Abstract Title:	**Bringing the One-Room Valley Schoolhouse Back to Life**		
Presenter:	Tamara Upton		
Mentor:	Kathleen Ryan		**Honors:** No
Co-Authors:			
Presentation Type:	Poster	**College:** College of Agricultural, Human and Natural Resources	**Major:** Interior Design
Category:	Arts and Design		

ABSTRACT:

The goal of the project was to integrate the Valley community perspective in the use of the co-design process in order to meet the needs of the community members. Collaboration during the design process to encourage different ways of thinking and speaking is a process to reach a design that both parties will agree on.

Interior Design students traveled to the town of Valley, WA to meet and discuss the project with the community members. The community members participated in a workshop to talk about their ideas for a history exhibit for the one-room schoolhouse. The Interior Design students collected ideas and information from the community and created a design to respond to the community ideas. The community also provided feedback to the students at different stages of the project.

Mixed methods were used for this project. Qualitative methods included student reflections on what they thought about travelling up to Valley, WA and speaking directly to the client of the project. Students said that this experience enhanced their understanding of the importance of the one-room schoolhouse and that it helped them connect to this project on a personal level. They also appreciated how realistic the design problem was and how they were able to visit the actual site and meet the people that will use this building in the future.

Sample student response: "Visiting the site and meeting with community members was a great experience because it immersed us in the culture of Valley."

A quantitative method was used for student surveys asking to evaluate their self-awareness, efficacy and their interdisciplinary knowledge. The student responses to the survey questions were mostly positive due to the first time at real life collaboration for the interior design students with the Valley community members. This collaboration brought a new level of understanding of what goes into a project by both parties. It also demonstrated how both parties think very differently which enriched the completeness of the design process during the project. Students realized the importance of communication in a project to ensure collaboration.

Presentation Number 64

Abstract Title:	**Oxidation of 99-Tc(IV) to Tc(VII) in Presence of Humic Acids**		
Presenter:	Mitchell Friend		
Mentor:	Nathalie Wall		**Honors:** No
Co-Authors:			
Presentation Type:	Poster	**College:** College of Arts and Sciences	**Major:** Chemsitry
Category:	Engineering and Physical Sciences		

ABSTRACT:

The goal of this project is to understand technetium behavior under environmentally relevant conditions. Technetium-99 (^{99}Tc), a fission product present in spent nuclear fuel, remains a problem for contaminated site clean-up, because of its high mobility in the environment. Tc(VII) is very soluble under oxic conditions, but Tc(IV), which can be found under mildly reducing conditions, is highly insoluble. Trivalent iron (Fe(III)) minerals, such as hematite (Fe_2O_3), can provide the necessary conditions for the oxidation of Tc(IV) to Tc(VII), but humic acids, ubiquitous in the environment and strong complexant, may hinder the oxidation process. To this extent, the oxidation of Tc(IV) to Tc(VII) upon contact with hematite was investigated in presence and absence of humic acids. Experiments were performed at an ionic strength of 0.1 M using NaCl as the background electrolyte and at pH 3.5 and pH 9, which correspond to points above and below the point of zero charge (pzc) of hematite. Binary systems hematite/humic acids and hematite/Tc, and the ternary system hematite/humic acids/Tc were studied. Total organic carbon (TOC) analyses indicate a maximum sorption of humic acids on hematite of ca. 80% at pH 3.5, corresponding to a hematite/humic acids ratio of 5:1 (in g:g); no measurable humic sorption was detected at pH 9. A solvent extraction using the anion extractant iodonitrotetrazolium chloride (INT)[1] was used to quantify Tc(VII) and Tc(IV), with Tc activities quantified by liquid scintillation counting. Oxidation of Tc(IV) to Tc(VII) was observed for systems at pH 3.5 in absence of humic acids, but the presence of humic acids decreases the amount of oxidation. Negligible Tc(IV) oxidation was observed for binary and ternary systems at pH 9. These results are important to help clean up sites that have been contaminated with Tc, to help achieve appropriate remediation.

(1) Boggs, M. A.; Gribat, L. C.; Boele, C. A.; Wall, N. A. *Journal of Radioanalytical and Nuclear Chemistry* **2012**, *293*, 843-846.

Presentation Number 65

Abstract Title:	**Breeding Amaranth**		
Presenter:	Josh Gefre		
Mentor:	Dr. Kevin Murphy		**Honors:** No
Co-Authors:	Hannah Walters		
Presentation Type:	Poster	**College:** College of Agricultural, Human and Natural Resources	**Major:** Field Crop Management
Category:	Organismal, Population, Ecological, and Evolutionary		

ABSTRACT:

The objective of this project is to identify breeding lines of amaranth with traits that contain agronomic benefits for the production sector of the Pacific Northwest. Once positive traits are identified they can then be at the disposal of amaranth breeders to produce new productive varieties. Some agronomic factors that would benefit farmers include pest/disease resistance, early maturity, and added color to help distinguish amaranth from pig weed.

More recently, amaranth breeding has been picked up in the United States due to its high nutritional content. Amaranth seed and dried greens contain high amounts of protein, between 16 and 18 percent (Putnam). Amaranth is high in the amino acid lysine and fiber. The lysine content in amaranth is three times greater than that of corn and two times higher than that of wheat (Svirkis). Another advantage that amaranth has over wheat is that it is gluten free and is another food option for those suffering with gluten related allergies. For these reasons amaranth has picked up in popularity with the health food industry creating a greater demand and a potentially greater amount of profitability for farmers (University of Kentucky Extension).

Works Cited

Putnam, D. et al. 1989. Alternative Field Crops Manual. Available at: http://www.hort.purdue.edu/newcrop/afcm/amaranth.html (verified 25th July 2013. University of Wisconsin-Extension.

University of Kentucky Extension. 2011. Grain Amaranth. Available at: http://www.uky.edu/Ag/CDBREC/introsheets/amaranth.pdf. University of Kentucky-Extension

Svirkis, A. 2003. Investigation of amaranth cultivation and utilization in Lithuania. Agronomy Research. 1(2):253-264.

Presentation Number 66

Abstract Title:	**Learning at Home: Demographic Differences in the Home Learning Environment which Influence Kindergarten Academic Achievement**		
Presenter:	Colleen Chalmers		
Mentor:	Dr. Brittany Rhoades-Cooper		**Honors:** Yes
Co-Authors:			
Presentation Type:	Poster	**College:** College of Arts and Sciences	**Major:** Psychology
Category:	Social Sciences		

ABSTRACT:

Research shows that the home learning environment is associated with children's academic outcomes; however less research has been conducted about how the relationship between the home learning environment and children's academic achievement differs by various socio-demographic variables including ethnicity, language spoken at home, maternal education, and parent and marital status. The data set I will be using for my research is the FACES (Family and Children's Experiences Study) 2009 cohort study, which includes a sample of 3,400 children and their families from across the country who attended Head Start programs. By using data from Head Start students, I have eliminated the impact of poverty status, as all students in the sample are from a low-income family.

Studies have shown that the mother's level of education is one of the most important predictors of child outcomes, especially for children of poor mothers. There is also evidence mothers with lower levels of education provide less stimulating home environments. Lower education levels typically mean lower paying jobs, making it challenging to provide an academically stimulating home environment. For these reasons, I expect to find that maternal education will be strongly related to children's academic achievement. Research also shows that there are significant differences between European American, Asian American, Hispanic American, and African American households' learning environments. Ethnicity and culture have also been shown to be among the strongest predictors of family involvement in their child's learning. For these reasons, I expect to find that race/ethnicity will be strongly related to children's home learning environment and academic achievement.

In all, I hope to understand through my research which socio-demographic variables are most strongly associated with the home learning environment and children's academic achievement. With this information, Head Start programs can better target their services to those groups who are at highest risk for poor outcomes and thus improve children's success in kindergarten.

Presentation Number 67

Abstract Title:	**Binding Site and Regulation Mechanism of Bacterial Flagellum Polymerization through the Binding of FlgM and FliS**		
Presenter:	Bryan Killinger		
Mentor:	Dr. Alla Kostyukova		**Honors:** No
Co-Authors:	Dr. Natalia Moroz, Dr. Dmitri Tolkatchev, Dr. Alla Kostyukova		
Presentation Type:	Poster	**College:** College of Engineering and Architecture	**Major:** Chemical Engineering
Category:	Molecular, Cellular, and Chemical Biology		

ABSTRACT:

Motile bacteria navigate through their environment by the use of flagellum, a hair-like structure that propels bacteria via a rotary engine using proton motive force. The flagellum structure consists of a basal body, a hook, and a filament. The filament is primarily composed of polymerized FliC protein, which is produced inside the bacteria and exported out through a hollow channel in the center of the flagellum. To prevent premature polymerization of the filament within the bacteria, the flagellar chaperone FliS binds to the C-terminal of newly synthesized FliC. FlgM acts as an anti-sigma factor for the transcription of the sigma factor FliA, which is responsible for FliC transcription. Inhibition of FliA by FlgM prevents the transcription of FliC. New interaction between FliS and FlgM has been discovered recently. This study determines the position of the binding site in FlgM. Due to the disordered nature of FlgM, this protein or its complex with FliS cannot be crystallized. Therefore, NMR spectroscopy was chosen to determine the structure of the FliS-FlgM complex. This complex is approximately 25kDa, a relatively large complex for NMR spectroscopy. Thus, N-terminal truncated mutants of the FlgM fused with expression tag, which includes poly-His for affinity purification, were tested to determine if they are able to bind to FliS similar to the wild type FlgM. After Ni-NTA purification and assays using native gel electrophoresis, it was determined that both truncated FlgM mutants are able to bind to FliS, making NMR studies feasible.

Presentation Number 68

Abstract Title:	**Palouse Millet Variety Trial 2013**		
Presenter:	Victoria Barth		
Mentor:	Kevin Murphy		**Honors:** No
Co-Authors:			
Presentation Type:	Poster	**College:** College of Agricultural, Human and Natural Resources	**Major:** Integrated Plant Science
Category:	Organismal, Population, Ecological, and Evolutionary Biology		

ABSTRACT:

A trial was conducted in the summer of 2013 to test 20 varieties of proso millet from around the world for adaptation and agronomic performance in the Palouse. The trial was planted in Pullman, Washington at the WSU Organic Farm, in a split-block, randomized complete block design. The main plots were millet variety, and the sub-plots were irrigation treatment. Three replicates of each variety were grown in a non-irrigated (dryland) treatment, and three replicates were grown in an irrigated treatment. Several traits were evaluated to determine which varieties were best suited for the Pacific Northwest. Mean plant height across all was 140.05 cm and 41.21 cm in the irrigated and non-irrigated treatments, respectively. Five varieties of the non-irrigated plots did not produce seed. Only varieties 'Komsomolskoe', 'Kazanskoe', 'Veszelopodoljanszkoe' and 'Unikum' produced seed in all three replicates in the non-irrigated treatment, and therefore may be the best suited for dryland grain production in the Palouse. Average grain yield was 204.98 grams/plot in the irrigated treatment, compared to 5.21 grams/plot in the non-irrigated treatment. 'Earlybird' had the highest average irrigated yield at 336.47 grams/plot while 'Unikum' had the highest non-irrigated yield at 14.30 grams/plot. 'Unikum' was the most broadly adapted millet cultivar, performing well in both the irrigated and non-irrigated treatments.

Presentation Number 69

Abstract Title:	**Influence of Parents in Higher Education Attainment: The Case of Latino Students from the Wenatchee and Yakima Valleys**		
Presenter:	Celia Mejia		
Mentor:	Dr. Carmen R. Lugo-Lugo		**Honors:** No
Co-Authors:			
Presentation Type:	Poster	**College:** College of Arts and Sciences	**Major:** Sociology
Category:	Social Sciences		

ABSTRACT:

As the Latina/o community in the United States continues to grow at a rapid pace, more Latina/o high-school students consider attending, and enroll in, college. This study examines parental influence on Latina/o students' pursuit of a higher education. Employing a mixed methods approach, data was collected via online surveys, and structured, in-person interviews. Results found, varied among the following variables; the parents education, language proficiency of the parents, and their socioeconomic standing. Latino parents know the importance of receiving an education and influence their children in positive ways that they are able to. Each Latino parent has an influence in his or her children in attaining higher education. The way that this influence affects each individual child is when we see a different journey of how they attained or are attaining their education.

Presentation Number 70

Abstract Title:	**Design and Testing of a Remotely Controlled Air-Cavity Boat**		
Presenter:	Alexander Mattson		
Mentor:	Konstantin Matveev		**Honors:** No
Co-Authors:			
Presentation Type:	Poster	**College:** College of Engineering and Architecture	**Major:** Mechanical Engineering
Category:	Engineering and Physical Sciences		

ABSTRACT:

Due to the large percentage of global cargo transport performed by shipping, there are always attempts made at creating more efficient ships. Beyond using different propulsion designs, one can work to increase efficiency by altering the hull shape. One promising method aims at creating an air filled recess under the hull, which is called an air cavity. The purpose of this configuration is to reduce direct contact of the hull with the surrounding water, which leads to a reduction of friction drag. The current project involves continuation of designing, building, and testing model-scale self-propelled boats which incorporate the air cavity hull and comparing their performance to conventional hull forms with flat bottoms and no cavity. The test boat models are manufactured out of foam covered with fiberglass, plywood, plexiglass, and metal and plastic connectors. The data is collected by visually monitoring the air cavity via a video camera mounted above the boat, as well as measuring the air pressure in the cavity with a pressure sensor and the force applied by the propulsor on the boat with a force gauge. Previously, a boat has been built and used to prototype and test the instrumentation and testing processes. The new boat is designed with refined instrumentation as well as an augmented size in order to more accurately collect data over wider ranges of air flow into the cavity, as well as boat velocity. By taking these measurements in a configuration with an air cavity as well as with an insert to modify the cavity to a flat bottom hull, we can compare their performances at different thrust values to determine drag reduction. The obtained results can be used for continued design of air-cavity hulls and validation of numerical models.

Presentation Number 71

Abstract Title:	**Motor and Dopamine Neuron Recovery in A 6-OHDA Parkinson's Disease Model using Oral Treatments of a Small Molecule Hepatocyte Growth Factor Agonist**		
Presenter:	Ashley Nilson		
Mentor:	Joseph Harding		**Honors:** No
Co-Authors:	Hamid Quayoum, Jewel LeValley, Zach Warmenhoven, Phillip Harris, Leen Kawas, and Joseph Harding		
Presentation Type:	Poster	**College:** College of Veterinary Medicine	**Major:** Neuroscience
Category:	Organismal, Population, Ecological, and Evolutionary Biology		

ABSTRACT:

Parkinson's disease is the second most common neurodegenerative disease in older adults where motor deficits are the primary symptoms. These symptoms are brought on by selective death of dopamine neurons in the substantia nigra, a portion of the brain responsible for relaying motor information. Current treatments mask the symptoms of the disease, but do not halt or reverse disease progression. We have previously shown that a compound called Dihexa improved motor function when given through intraperitoneal injection. Therefore, the purpose of this study was to confirm the effect of Dihexa on cell survival and renewal as well as determine the efficacy of oral treatments in a rat model of Parkinson's disease. We used behavioral tests to determine and monitor motor function before the injection of the toxin 6-hydroxydopamine (6OHDA), post-6OHDA injection, and during 35 days of treatment with Dihexa. 6OHDA selectively kills dopamine neurons in the substantia nigra. Pre-6OHDA injection data served as a baseline measure for healthy rats, while the post-6OHDA period provided the necessary time for motor function to deteriorate prior to the onset of treatment. The treatment phase was designed to compare motor function in healthy rats to 6OHDA rats with and without treatment. Motor function was assessed by gait analysis, a rope hang strength test, and a grip strength test. Additionally, histological analysis was conducted to determine the number of mature and newly forming dopamine neurons in the substantia nigra. Treated rats not only recovered motor function but displayed better function than the pre-6OHDA period. The histological analysis showed increased dopamine neuron levels with Dihexa treated animals. These results suggest that the compound Dihexa has neuroprotective and regenerative effects on the substantia nigra. Therefore, Dihexa has potential as a therapeutic and preventative treatment for Parkinson's disease. Studies on toxicity and dose range finding are the next steps necessary for developing Dihexa as a therapeutic.

Presentation Number 72

Abstract Title:	**Interface Design and Usability Testing for â€˜iSci: Interactive Technologies for Science Immersionâ€™**		
Presenter:	Amalia Vacca		
Mentor:	Dr. Dene Grigar		**Honors:** No
Co-Authors:			
Presentation Type:	Poster	**College:** College of Arts and Sciences	**Major:** Digital Technology and Culture
Category:	Arts and Design		

ABSTRACT:

An important and often overlooked part in the construction of many new products is usability testing. When implemented at an early stage in project design, developers, designers and programmers can work together with hard data to create a product that will be more fully functional at the time of release for public use requiring only minor modifications and upgrades shortly after.

It is precisely usability testing that is the focus of my project, "Interface Design and Usability Testing for 'iSci: Interactive Technologies for Science Immersion.'" Specifically, I am heading up the testing of the graphic interface that combines multiple technologies used by students in grades six through twelve.

The focus the iSci project is to harness commercially available interactive technologies involving physical computing, augmented reality, and haptic systems in order to bring to life lessons in Science, Technology, Engineering, and Math (STEM) to students from middle school through high school.

Through the use of what we have defined as an AppBook, the iSci team has created an online textbook, accessible through tablets or personal smart devices, which helps to guide the learning process. It is housed on a cloud-based system that allows for interaction between the student, the text, the activities and the teacher. It tracks student's progress and allows teachers to enter feedback directly into the students work. This creates permanent documentation that will follow the student throughout their education as a record of key concepts learned. The AppBook also becomes the controller that houses the SDK of the technologies that are combined into the haptic experience that includes augmented reality, the Kinect System and the Falcon game controller.

My role for this project is to test the usability of the current interface in the AppBook. Based on these results of this testing I will propose a modified design that will be implemented in the next stage of development of the overall iSci Project. The procedures for usability testing of this nature includes establishing parameters that would define a successful usability experience, testing the use of the interface on students in the sixth through twelfth grade and then evaluating their responses to present a modified design that addresses real time user experiences.

Presentation Number 73

Abstract Title:	**Stromal Derived Factor-1 Gene and Its Role in Early Mammalian Pregnancy**		
Presenter:	Natalie Nelson		
Mentor:	Dr. James Pru		**Honors:** Yes
Co-Authors:	Cindy A. Pru, Jon M. Oatley, James K. Pru		
Presentation Type:	Poster	**College:** College of Agricultural, Human, and Natural Resources	**Major:** Animal Sciences
Category:	Molecular, Cellular, and Chemical Biology		

ABSTRACT:

This project centered on the chemoattractant protein stromal derived factor-1 (SDF-1) and its role in establishing early pregnancy. In other tissues, SDF-1 serves to coordinate many diverse functions including cell migration and vascular development. The first series of experiments characterized the temporal and spatial expression of SDF-1 during embryo implantation using immunohistochemistry (IHC). In early pregnancy prior to embryo implantation SDF-1 was weakly expressed in the subluminal stroma. However, by day 8 of pregnancy, SDF-1 became abundantly expressed in the mesometrial region of the implantation site as well as the ectoplacental cone, both highly vascularized tissues. From this information we hypothesized that SDF-1 plays an essential role in early embryo implantation and uterine decidualization. The second set of experiments established the functional requirement of SDF-1 for early pregnancy. Here, Cre/loxP technology was used in mice to conditionally delete the SDF-1 gene from the female reproductive tract. Although the first set of experiments using IHC exhibited positive results in that SDF-1 was present in the female reproductive tract during early pregnancy, our second set of experiments including a breeding trail of the transgenic conditional knockout mice indicate that SDF-1 is dispensable for female fertility. Female mice lacking SDF-1 in the female reproductive tract were still fertile and able to successfully deliver normal numbers of pups/litter. These preliminary results do not support the hypothesis that SDF-1 plays a vital role in establishing early mammalian pregnancy. In conclusion, despite the fact that the *Sdf-1* gene is expressed during early pregnancy, our studies show that it is not essential for the growth and expansion of the embryonic trophectoderm.

Presentation Number 75

Abstract Title:	**The Interactive Effects of Phosphorus and Planktonic Grazers on Harmful Algal Blooms in Vancouver Lake, Washington**		
Presenter:	Vanessa Rose		
Mentor:	Steve Bollens and Gretchen Rollwagen-Bollens		**Honors:** No
Co-Authors:	Steve Bollens, Gretchen Rollwagen-Bollens		
Presentation Type:	Poster	**College:** College of Arts and Sciences	**Major:** Environmental Science
Category:	Organismal, Population, Ecological, and Evolutionary		

ABSTRACT:

Globally, harmful blooms of algae and/or cyanobacteria are occurring at increased frequencies in aquatic systems, posing serious health risks to humans and animals. Algal/cyanobacterial blooms are considered harmful when they produce toxins, alter food webs, or deplete oxygen levels. Algal/cyanobacterial growth is moderated by grazing (top down control) or nutrient availability (bottom up control). The goal of this study was to examine the interactive effects of phosphorus and grazing on growth of algae/cyanobacteria in Vancouver Lake, Washington, where harmful cyanobacteria blooms are an increasing problem. Field data were collected weekly from May through October 2013 to monitor nutrient levels, chlorophyll *a*, and other conditions. Experiments were conducted using lake water, containing natural plankton assemblages, incubated with an amendment of phosphate, mesozooplankton (copepod) grazers, or both. Incubation experiments were conducted every two weeks over the course of the bloom cycle and analyzed for significant differences in net growth of algae/cyanobacteria among treatments. Field monitoring revealed that a bloom formed in late July and persisted until early September. In the two pre-bloom experiments, net growth was positive in controls and negative in grazer treatments. Net algal/cyanobacterial growth was also positive in phosphate and mixed treatments during the experiment ~4 weeks before the bloom, but negative in the experiment conducted just before the bloom began. Peak bloom experiments during August revealed net growth in the control and phosphate amended treatments were highest, while growth was lower but still positive in grazer and mixed treatments. Post bloom, the control and phosphate treatments showed positive growth, while grazer and mixed treatments showed negative growth. These results suggest that grazing has a greater influence on algal/cyanobacterial growth before and after a bloom, even with added phosphate, but does not limit growth during a bloom; phosphate addition may increase algae/cyanobacterial growth during a bloom, with less effect before and after. Our findings reveal how control of bloom formation and decline in temperate lakes may alternate between top down and bottom up factors, which has important implications for determining the best approach to managing these systems.

Presentation Number 76

Abstract Title:	**Passive PEM Fuel Cell-Battery Hybrid Power System for UAS**		
Presenter:	Patrick Gavin		
Mentor:	Jacob Leachman		**Honors:** Yes
Co-Authors:			
Presentation Type:	Poster	**College:** College of Engineering and Architecture	**Major:** Electrical Engineering
Category:	Engineering and Physical Sciences		

ABSTRACT:

A passive fuel cell-battery hybrid power system has been developed for Genii, Washington State University's UAS demonstrator. In addition to augmenting the fuel cell power for takeoff, the batteries provide a power source during fuel cell humidification transients and reserve power in the event of a fuel cell failure. Although this system has been designed with specific characteristics of proton exchange membrane (PEM) fuel cells in mind, it would also be compatible with many other experimental power systems and provide the security of a battery reserve. Bench testing has demonstrated this system to effectively combine the power from a 1kW PEM fuel cell and lithium polymer batteries to allow for long duration flights.

Presentation Number 77

Abstract Title:	**Mother - Student Communication and College Adjustment**		
Presenter:	Annette Perales		
Mentor:	Dr. Matthew Bumpus		**Honors:** No
Co-Authors:			
Presentation Type:	Poster	**College:** College of Arts and Sciences	**Major:** Psychology
Category:	Social Sciences		

ABSTRACT:

This quantitative study explores communication between mother and student as the student moves away for college. This can be a difficult time for students and their families. Identifying factors that can impact student transitioning can help students more readily adapt to their new environment in a healthy way. The sample consists of 234 freshmen at Washington State University, 18-19 years old. Participants completed a questionnaire measuring communication frequency along the variables of closeness with mother, alcohol-consumption, and self-esteem. A significant finding revealed that on average, participants increased alcohol-consumption from pre-college to three months into their first semester. The relationship between communication frequency and alcohol-consumption showed that students with a high level of communication with their mothers had the greatest increase in alcohol-consumption. Future studies can focus on individual personality traits in relation to these factors and obtain a larger sample size to contribute to generalizability and more significant findings.

Presentation Number 78

Abstract Title:	**Exploiting a Yeast Surface Display System for the Identification of Novel Malarial Inhibitors**		
Presenter:	Alexander Wulf		
Mentor:	Margaret E. Black		**Honors:** No
Co-Authors:	Cindy J. Choy, Stacy E. Hathcox Cliff E. Berkman, and Margaret E. Black		
Presentation Type:	Poster	**College:** College of Veterinary Medicine	**Major:** Biochemistry
Category:	Molecular, Cellular, and Chemical Biology		

ABSTRACT:

Malaria is caused by the mosquito-borne parasite, *Plasmodium falciparum*. Some of the most crucial proteins for plasmodial growth and development are cyclin-dependent kinases (CDKs), which are involved in regulating cell division. Because of their importance in cellular growth, CDKs are potentially excellent targets for the development of anti-malarial drugs. In order to screen for novel drugs, these plasmodial kinases must be expressed in their native conformation. However, difficulties with expression and maintenance of proper protein conformation of plasmodial proteins have hindered the identification of novel drugs. Therefore, we seek to develop a model yeast surface display system to remedy the problems associated with the expression of *Plasmodium* proteins. In this system, the model protein *P. falciparum* MO15-related protein kinase (*Pfmrk*) is expressed as a fusion protein with yeast protein Aga2p from the yeast surface display vector pETCON. Aga2p interacts and forms a complex with Aga1p, a protein found in the outer membrane, thus allowing *Pfmrk* to be displayed on the surface of the yeast cell. Two *Pfmrk* gene constructs (the native sequence and a codon optimized version for bacterial expression) were PCR amplified and cloned into the shuttle vector pCR2.1TOPO. These genes will be subcloned into pETCON and used to transform the *S. cerevisiae* yeast strain EBY100 (encodes Aga1p). The addition of galactose to the growth medium will allow for Aga2p-*Pfmrk* fusion protein expression and display of *Pfmrk* on the yeast surface. Future experiments with these yeast surface displayed *Pfmrk* strains include verification of *Pfmrk* activity and binding of a panel of known *Pfmrk* inhibitors. Once the yeast surface display model has been validated, future studies will include the development of a high-throughput screening assay to identify novel anti-malarial drugs that specifically target *Pfmrk,* and to expand this yeast display platform to other plasmodial kinases.

Presentation Number 79

Abstract Title:	**A Rapid Algorithm for Detecting Antibiotic Resistance Gene Sequences from Next-Gen Sequencing Data**		
Presenter:	Gabriel de la Cruz		
Mentor:	Dr. Shira Broschat		**Honors:** No
Co-Authors:	Gokcen Cilingir, Shira L. Broschat, Douglas R. Call, Margaret A. Davis, Lisa H. Orfe		
Presentation Type:	Poster	**College:** College of Engineering and Architecture	**Major:** Computer Science
Category:	Computer Science, Mathematics, Statistics, and Information Sciences		

ABSTRACT:

Next-generation sequencing is being used increasingly to characterize genome sequences for bacterial pathogens. This type of analysis can be useful as a tool for identifying antibiotic resistance genes and for providing detailed data at the level of sequence variation that can be used for studies of molecular epidemiology. The challenge, however, is to rapidly sift through large sets of data to find all potential resistance gene sequences. We used a multiplex sequencing strategy with an Illumina MiSeq to generate genome sequences for 50 isolates of *E. coli* and *Salmonella*. To analyze these data we developed a computer algorithm based on an align-assembly approach. Sequence data were first prescreened against reference genome sequences (GenBank NC_007779.1 and NC_003197.1) using Sequence Alignment/Map (SAM) Tools and PySAM. Unmapped sequences were assumed to include antibiotic resistance genes, and these sequences were aligned against a local antibiotic resistance database using the Basic Local Alignment Search Tool (BLAST). The results of the alignment process were manipulated using BioPython to retrieve high-scoring sequences; these were assembled against corresponding antibiotic resistance gene sequences using the CLC Genomics Workbench. Data from this analysis can be used to compare resistance genes for the sequenced isolates and to develop a catalog of single-nucleotide polymorphisms (SNPs) that can then be used to develop high throughput assays to study the molecular epidemiology of antibiotic resistance.

Presentation Number 80

Abstract Title:	**Agricultural Intensification**		
Presenter:	Lillian Warto		
Mentor:	David Crowder		**Honors:** No
Co-Authors:	David Crowder, Sergey Lapin		
Presentation Type:	Poster	**College:** College of Arts and Sciences	**Major:** Mathematics
Category:	Organismal, Population, Ecological, and Evolutionary Biology		

ABSTRACT:

This project was focused on the impacts of agricultural intensification on pest outbreaks and yield losses in cropping systems. In many parts of the world, farmers have intensified their agricultural practices by planting more crops per unit area and/or more crops per year to keep food production at a level that meets demand. However, while planting more crops per unit area or per unit time would intuitively yield more crops, this has not always been the case. The research on agricultural intensification, pest outbreaks, and yields has received little theoretical attention in the literature. Using three different models, we were able to explore whether agricultural intensification could lead to situations where pest populations grow to such a massive extent that they will destroy any yield that a farmer might otherwise receive by extra plantings. The three models developed are a series of consumer resource models that demonstrate the relationship between crop, prey, and predator populations. We chose these model structures because it has been successfully used in previous ecology scenarios. We are reapplying it to an agricultural system to model predator-prey relationships as well as herbivore-plant relationships, both of which are critical for pest densities and crop production. After running well chosen theoretical data through the model we found results that we assumed to be relatively standard. As time went on, we saw an initial rapid growth in the herbivore population which triggered a rapid growth in the predator population close after. As the predators grew and continued to consume herbivores, the Plant population leveled out. As time goes on we continue to see oscillation in the herbivore and predator populations.

Presentation Number 81

Abstract Title:	**Alteration of the Kinetics of Methane Reformation by Application of an Electrical Field Across a Sintered Nickel Catalyst**		
Presenter:	Jake Gray		
Mentor:	Su Ha		**Honors:** No
Co-Authors:			
Presentation Type:	Poster	**College:** College of Engineering and Architecture	**Major:** Chemical Engineering
Category:	Engineering and Physical Sciences		

ABSTRACT:

Traditional techniques for altering reaction speeds, such as adding a non-reactive catalyst or by modifying the temperature of the reactor, are limited. After these factors have been considered, there is very little else one can do to further affect the speed of a reaction. As a result, many industrial chemical reactions are slow and expensive processes, or require large amounts of energy to perform. The focus of my research is to investigate methods for improving the kinetics of a reaction without increasing reactor temperatures and using inexpensive catalytic materials. In particular I am looking at the effects of applying an electric field to a nickel catalyst during the reformation of methane, an important process which produces ~95% of the world's hydrogen. Replacing traditional energy-expensive heating processes with a low-power electrical field supplied by renewable sources will remove additional hurdles facing the sustainability of hydrogen fuel cells. Nickel powder was sintered to form a thin cylindrical pellet. This pellet was then adhered to quartz tubing using a ceramic paste and silver wires were attached to the pellet to supply the electrical potential energy. This assembly constituted a simple reactor in which methane gas and air were supplied in stoichiometric quantities at 600°C. This reaction should convert the methane gas to carbon monoxide and hydrogen gas. This will be confirmed using gas chromatography, and a simple K-type thermocouple will be used to monitor the temperature of the nickel pellet. Electrical potential will then be applied across the pellet. It is hypothesized that the application of this field will increase the reaction rate and the total amount of hydrogen produced while maintaining a constant reaction temperature, as confirmed by the gas chromatogram and temperature measurements.

Presentation Number 82

Abstract Title:	**E2A and HEB are Indispensable Transcriptional Regulators of Pituitary and Uterine Physiology**		
Presenter:	Michele Reinelt		
Mentor:	James Pru		**Honors:** Yes
Co-Authors:	Nicole C. Clark, Cindy A. Pru, Maria K. Herndon, John P. Lydon, Yuan Zhuang, Francesco J. DeMayo, Jon M. Oatley, John H. Nilson, James K. Pru.		
Presentation Type:	Poster	**College:** College of Agricultural, Human and Natural Resources	**Major:** Animal Science
Category:	Molecular, Cellular, and Chemical Biology		

ABSTRACT:

Infertility affects approximately 15% of women. Members of the E-protein helix-loop-helix family of transcription factors regulate developmental processes in vertebrates such as myogenesis, neurogenesis, pancreatic development and lymphopoiesis. E-proteins function by binding specific DNA sequences called E-box elements. E-protein products encoded by *E2a* and *Heb* form homodimers, as well as heterodimers with other E-proteins. E47/E12 and HEB are encoded by *E2a* and *Heb*, respectively. The objectives of this study were to: 1) evaluate expression of E47 in female reproductive tissues by immunohistochemistry (IHC); and 2) determine if E2A and its partner HEB are required for female reproduction. IHC revealed that E47 was abundantly expressed in ovarian follicles and corpora lutea (CL). To study the function of *E2a* and *Heb* in female fertility, double conditional knockout (dcKO) mice were generated upon crosses with *Pgr-cre* mice. Control females gave birth to expected numbers of pups; however, dcKO females failed to deliver any pups over a 5 month period when housed with males of proven breeding capacity. Unlike control mice that responded expectedly to artificial decidualization, a diminution of decidualization in dcKO mice was observed in which the uterus failed to completely differentiate. When we looked at the ovary histological analysis showed an absence of CL in 6-8 week old dcKO females, suggesting that ovarian physiology may also be dependent upon *E2a*/*Heb* function. However, control and dcKO mice responded normally to superovulation. E2A/HEB were then conditionally deleted from granulosa cells by crossing with *Amh-cre mice*. *Amh-cre* dcKO mice were fertile, displayed normal ovarian histology, responded normally to superovulation and gave birth to expected numbers of pups. These findings suggest that *E2a* and *Heb* are not needed for ovarian function. Because *Pgr-cre* mice also have the capacity to delete floxed genes in the pituitary, and because dcKO failed to generate CL, the expression of select genes was assessed in the pituitary by real time RT-PCR. *Lhb* and *Cga* were found to be significantly reduced in dcKO mice which in turn accounts for the lack of CL. This extends our understanding of the genes required for fertility and when dysfunctional contributes to infertility.

Presentation Number 83

Abstract Title:	**A Mathematical Model to Identify Mechanisms of HSV-2 Containment in Mice**		
Presenter:	Steven Monda		
Mentor:	Anita Vasavada		**Honors:** No
Co-Authors:	Laura Matrajt, Sarah Roepke, Kristin E. Weakly, Martin Prlic, Joshua T. Schiffer		
Presentation Type:	Poster	**College:** College of Engineering and Architecture	**Major:** Bioengineering
Category:	Molecular, Cellular, and Chemical Biology		

ABSTRACT:

There is an increasing focus on eliciting a robust tissue resident CD8+ T-cell response to Herpes Simplex Virus-2 (HSV- 2) with a vaccine, as both human and murine studies have demonstrated these cells to be critical in controlling HSV-2 genital reactivations. We performed mathematical modeling of viral load data from mice that were vaginally infected with HSV-2. Mice with varying degrees of immune function, including mice transplanted with HSV specific CD8+ T-cells, poorly controlled HSV-2 replication. Our differential equation based model closely fit the data from each mouse. Further model simulations predict different viral load trajectories for antibody and cell-mediated viral control, suggesting that the model will be a valuable tool for identifying mechanisms of immune containment of virus. Future work will use data from mice with an increased level of tissue resident HSV-2 specific CD8+ T-cells, at which time the model will be implemented to identify by what mechanism viral containment occurs.

Presentation Number 84

Abstract Title:	**Plant Response to Herbivory by Malacosoma Californicum Pluviale and Cryptorhynchus Lapathi at Mount St. Helens Volcano**		
Presenter:	Benjamin Joner		
Mentor:	Dr. John Bishop		**Honors:** No
Co-Authors:			
Presentation Type:	Poster	**College:** College of Arts and Sciences	**Major:** Environmental science
Category:	Organismal, Population, Ecological, and Evolutionary Biology		

ABSTRACT:

The extent to which herbivores impact primary succession is relatively unstudied. Effects occur by impacting plant growth and by affecting nutrient cycling. Plant functional traits of Sitka alder and Sitka willow were measured on primary successional sites at Mount St. Helens, Washington to assess responses to herbivory by western tent caterpillar (WTC) and the non-native willow weevil borer (WWB). In this study, we attempt to determine which insect herbivore, WTC or WWB has a greater impact on alder and willow. Fifty-six pairs of Sitka willow and Sitka alder (total of 112 plants) were studied with one member of each pair sprayed with pesticide (exclusion treatment), while the other was left alone (control). From 2012 to 2013, removal plants grew faster than controls. Moreover, leaf nitrogen content (leaf %N) was reduced from 2012 to 2013, possibly as an induced response to WTC defoliation. Sitka willow responded to damage by the WWB by increasing new growth (green stems); this suggests Sitka willow may have a greater capacity for recovery against WWB than Sitka alder.

Presentation Number 85

Abstract Title:	**Enhancing Neurodiversity at WSUV**		
Presenter:	Michelle Folger		
Mentor:	Dr. Dana Lee Baker		**Honors:** No
Co-Authors:			
Presentation Type:	Poster	**College:** College of Arts and Sciences	**Major:** Psychology
Category:	Social Sciences		

ABSTRACT:

Higher education students are increasingly representative of diverse backgrounds, and as such their approach towards obtaining a degree and interacting within the college atmosphere varies significantly. The concept of neurodiversity awareness first became pervasive with Autistic individuals' resistance to the medical model, which seeks a cure and implies a lack of normalcy within the Autistic brain. Instead the Autistic person purposefully views their brain, along with other neurodiverse brains, as being wired differently than that of the neurotypical brain. This can be considered standard variation among individuals, which generously lends itself to various forms of diversity and self-expression. This terminology and viewpoint is utilized in an effort to recognize the neurodiverse character as a whole. Since awareness first began, neurodiversity has grown to include such conditions as Attention Deficit Hyperactivity Disorder, Bipolar Disorder, Dyscalculia, Dyspraxia, Dyslexia, and Tourette Syndrome. The purpose of this article is to explore the dynamic nature of neurodiverse inclusion, as well as the factors that contribute to the inherent tension within the atmosphere that inclusivity creates in higher education. By identifying these factors, using data collected via survey and through publicly available records in college and university settings, administrators will be better equipped to create an atmosphere which is conducive to the learning of all campus community members. The information presented here may impact future policy implementation which will likely relieve some of the inevitable discomfort that comes from the change related to neurodiversity.

Presentation Number 86

Abstract Title:	**Exosome Detection Using a Modified Synaptotagmin-1 Derived Peptide**		
Presenter:	Jack Hyder		
Mentor:	Jonel Saludes		**Honors:** No
Co-Authors:			
Presentation Type:	Poster	**College:** College of Veterinary Medicine	**Major:** Biochemistry
Category:	Molecular, Cellular, and Chemical Biology		

ABSTRACT:

Exosomes are extracellular lipid vesicles that are implicated to have major roles in a variety of diseases and disorders, from various types of cancer to schizophrenia. In view of these diseases, it has been discovered that in certain bodily fluids, such as urine or blood plasma, there is an increased concentration of exosomes. While there has been research on qualitative detection of exosomes using surface proteins as biomarkers, there has been very little research on the quantitative detection of exosomes in bodily fluids as a biomarker of these diseases. Towards the goal of developing a peptide-based sensor for exosomes, a prior report has shown that a short loop from the protein Synaptotagmin-I has the ability to detect exosomes and its synthetic equivalent called liposomes, albeit with a weak affinity. Continuing off of this work, herein we report on a modified sequence of this peptide, using two tryptophan mutations with the goal of increasing its lipid vesicle affinity. The peptide was synthesized using a microwave-assisted solid phase synthesizer, cyclized using 'Click' chemistry, and purified by high performance liquid chromatography. Characterization was performed using MALDI-TOF mass spectrometry and IR spectroscopy. Binding assays were done using liposome models to evaluate its lipid vesicle affinity.

Presentation Number 87

Abstract Title:	**Determining The Mass Flow Rate of Solid Argon**		
Presenter:	Hanna Raine		
Mentor:	Dr. Jacob Leachman		**Honors:** No
Co-Authors:	Jacob Fisher		
Presentation Type:	Poster	**College:** College of Engineering and Architecture	**Major:** Mechanical Engineering
Category:	Engineering and Physical Sciences		

ABSTRACT:

Based on current theory, the most efficient way to fuel a fusion reactor is to inject pellets of solid hydrogen into the reaction chamber. A twin-screw extruder that could feed hydrogen into fusion tokamaks has been built in the Hydrogen Properties for Energy Research (HYPER) Lab at Washington State University - Pullman. Measuring the extrusion mass flow rate of the solid hydrogen to is critical to determine volumetric efficiency and demonstrate the potential of this fuel source. My research aims to develop and validate a mass flow rate sensor for solid cryogens. This cryogenic mass flow sensor will be based on the thermal flow meter design used with room temperature fluids. Measuring the change in temperature of a flow of solid argon while heat is applied will produce a system curve that can be extrapolated to measure the flow of solid hydrogen and other cryogenic solids. The results of this research will help develop a fuel source for fusion reactors and be a contribution to cryogenics in general.

Presentation Number 88

Abstract Title:	**Visualization**		
Presenter:	K.O. Nishimura		
Mentor:	Kathleen Ryan		**Honors:** No
Co-Authors:			
Presentation Type:	Poster	**College:** College of Agricultural, Human, and Natural Resources	**Major:** Interior design
Category:	Arts and Design		

ABSTRACT:

Our goal for this research is determine the common learning style and visual reasoning skills for first year design students.

Visualization skill improves through the experience of design. The ability to visualize and to understand spatial organization is an important skill to being a good designer.

Learning style has been linked to visualization ability. As interior designers use visualization to solve problems in design, it is an important measure for success as a designer.

In the first step, 83 first year design students completed the Learning Style Index (LSI). In the second step, a selection of first year and fourth year design students completed a spatial visualization quiz. In the third step, we compared the spatial visualization quiz between first year and fourth year students, with results of the Learning Styles Index. We also looked at design work completed by first and fourth year students.

According to the student's Learning Style Index, The average score for visualization is 6.8 points and verbal is 0.2. Design student are obviously prefer visual thinking. This result indicates that students studying design are mostly visual thinkers. We compared the first year student work showing three-dimensional drawings. By the end of the semester the first year students improved in their ability to show three-dimensional drawings. Especially in composition of the drawing, most students improved by the end of the semester. The spatial visualization test was compared and showed that the average score for first-year students is 34% correct, and fourth year students is 54% correct. Thus, we can conclude that visualization skills improved through learning design.

Presentation Number 89

Abstract Title:	**Analysis of Non-Randomly Distributed SNPs in floR**		
Presenter:	James Volz		
Mentor:	Dr. Douglas Call		**Honors:** Yes
Co-Authors:	Lisa Orfe, Doug Call		
Presentation Type:	Poster	**College:** College of Veterinary Medicine	**Major:** Microbiology
Category:	Molecular, Cellular, and Chemical Biology		

ABSTRACT:

From cancer to cardiovascular disease, arthritis to malaria, a plethora of conditions affect individuals of all ages, incomes, and locations. Antibiotic resistant bacteria clearly contribute to this problem on a worldwide basis, accounting for over 2 million annual cases the United States alone. Although this number is alarming, veterinary medicine may be facing an even stronger impact from these resistant bacteria. In 2011, food producing animals were prescribed four times as many antibiotics as of human, in terms of total product mass. The "Mass Action Hypothesis" predicts that spectrum in which the majority of antibiotics are used will impact the development of resistance the most. Nevertheless, the majority of veterinary antibiotics are used in low concentrations as growth promoters. This usage does not influence selection as strongly as therapeutic dosages, where the concentration is much higher.

The antibiotic florfenicol is commonly used to treat Bovine Respiratory Disease. Resistance to this drug is frequently conveyed by an efflux pump encoded for by *floR.* We have discovered that this gene has a high propensity for mutation, in the form of single nucleotide polymorphisms that are non-randomly distributed through the coding sequence. We hypothesize that this non-random distribution is indicative of active selection for either increasing the magnitude of resistance, increasing the scope of resistance, or it is indicative of selection against the presence of *floR* in the absence of antibiotic. For the latter, constitutive expression of *florR* could make the host bacterium vulnerable to events such as phage predation. I am investigating factors for this sequence diversity, as understanding the mechanism will likely offer new opportunities to limit antibiotic resistance. To date I have found that sequence diversity includes loss of function, suggesting that the first two alternatives are less likely and that the pattern we have observed is due to a fitness-reducing pressure and this may be a mechanism that we can turn against antibiotic resistance in other systems.

Presentation Number 90

Abstract Title:	**Opium in Protestant Missionary Communications: A Study of Protestant Missionary Communications on the Opium Issue to their Western Audiences, 1817-1907**		
Presenter:	Hilary Sandberg		
Mentor:	Dr. Lydia Gerber		**Honors:** No
Co-Authors:			
Presentation Type:	Poster	**College:** Edward R. Murrow College of Communication	**Major:** Strategic Communication Public Relations
Category:	Humanities		

ABSTRACT:

The nineteenth century was a formative period for Chinese-Western relations, characterized by the impact of the illegal western opium trade, culminating in the Opium Wars of 1839-42, the signing of Unequal Treaties, Extraterritoriality and the opening of western-dominated treaty ports along the Chinese coast. Prevailing attitudes of the time still impact sentiments and interactions between China and the West today. This project investigates western Protestant missionary communications about the opium problem in China and how these communications portrayed Chinese people, culture and society to their western audiences within the context of the opium issue.

This project specifically examines selections of widely read literature from prominent Protestant missionaries in China between 1817 and 1907. These include sermons and books by Robert Morrison (1782-1834), a book and journal publication by Charles Gützlaff (1803-1851), comprehensive treatises on China by W. H. Medhurst (1796-1857), S. W. Williams (1812-1884), and W. A.P. Martin (1827-1916); and books, memoirs and publications by J. Hudson Taylor (1832-1905).

This study analyzes how these communications reflect controversy or consensus among the missionary community about the opium problem. The findings suggest that the perception of the opium trade changes over time, from being a secondary problem, in light of the urgent need to spread the gospel, into a central issue, which not only hindered western secular interests in China, but more importantly prevented the spreading of Christianity in China.

While missionary communications represent only one sector of western views on China during the nineteenth and early twentieth centuries, missionaries were among few westerners at the time possessing expertise in the China sphere. Their communications to audiences back home helped lay the foundation for the western perception of Chinese society. What we can learn from their early interpretations and communications about China helps deepen our understanding of the origins of some of the generalizations, sentiments and stereotypes the West holds about China today.

Presentation Number 91

Abstract Title:	**Whole Wheat Prevent Obesity and Cardiovascular Disease Risk in Obese Diabetic Db/Db Mice**		
Presenter:	Andrea Dittmer		
Mentor:	Dr.Giuliana Noratto		**Honors:** No
Co-Authors:	Indira Mohanty and Diana Alcantara		
Presentation Type:	Poster	**College:** College of Agricultural, Human, and Natural Resources	**Major:** Food Science
Category:	Applied Sciences		

ABSTRACT:

Obesity is a risk factor leading to inflammation and chronic diseases. We investigated how whole wheat can prevent metabolic disorders in obese mice. Experimental groups were feed with standard diet containing whole wheat as source of carbohydrates and proteins ad libitum; the placebo and lean mice groups received isocaloric standard diet with dextrose and starch as source of carbohydrates and casein as source of proteins. Body weights were weekly recorded and fat tissue collected after 8 weeks. Results showed that body mass index (BMI) on the whole wheat group was lower ($p<0.05$) than the obese control (84%). Accordingly, weights of fat tissues in obese mice fed with whole wheat diet were lower than the obese control group. Subcutaneous fat, abdominal fat, and heart fat in mice fed with whole wheat diet were 66%, 81% and 66% of obese mice fed with standard diet, respectively. Overall, these results indicate a protective effect of whole wheat against obesity and body fat accumulation. We are currently investigating the molecular mechanisms involved in the cardio protective effects of whole wheat consumption.

Presentation Number 92

Abstract Title:	**Fabrication of Unmediated, Compressed Bioanodes to Utilize the Oxidation of Glucose Towards the Creation of an Enzymatic Biofuel Cell**		
Presenter:	Gunnar Hoff		
Mentor:	Professor Su Ha		**Honors:** No
Co-Authors:			
Presentation Type:	Poster	**College:** College of Engineering and Architecture	**Major:** Chemical Engineering
Category:	Engineering and Physical Sciences		

ABSTRACT:

Enzymatic biofuels cells represent one approach to clean energy production which use chemically modified electrode surfaces that can harness the flow of electrons produced and consumed by redox enzymes. Instead of expensive metal catalysts, biofuel cells use renewable enzymes as the catalysts which have good activity at near-room temperature and neutral pH. The major challenges facing enzymatic biofuel cells that need to be overcome are increasing power density and enzyme stability.

This undergraduate research project involved an enzymatic biofuel cell system that utilizes glucose as the fuel source due to its abundance in nature and glucose oxidase (GOx) to catalyze the oxidation reaction of glucose to gluconolactone. The bioanodes are fabricated by compression of a mixture of carbon nanotubes, water and glucose oxidase to obtain a pellet and a platinum wire was connected to one side using a conductive adhesive. Crosslinked enzyme clusters (CEC) of glucose oxidase where used in the bioanodes which have been shown to retain high enzyme stability. The CECs of glucose oxidase where prepared by precipitating GOx molecules in the presence of ammonium sulfate to form enzyme aggregates and then crosslinking the aggregates using glutaraldehyde. The un-reacted maleic anhydride and aldehyde groups after crosslinking where capped by incubating in Tris buffer (pH 7.2) and then the samples were washed and stored with PBS buffer (pH 7.0). Electrochemical measurements where preformed with the compressed bionade, Ag/AgCl and platinum wire as working electrode, reference electrode and counter electrode respectively at room temperature (20-22^{o} C) in PBS buffer (pH 7.0)

Presentation Number 93

Abstract Title:	**Effect of Temperature on Trout Body Shape**		
Presenter:	Marcia Nygaard and Kelsi Lakey		
Mentor:	Pat Carter		**Honors:** No
Co-Authors:	Kelsi Lakey		
Presentation Type:	Poster	**College:** College of Engineering and Architecture	**Major:** Bioengineering
Category:	Organismal, Population, Ecological, and Evolutionary Biology		

ABSTRACT:

Climate change is expected to have large effects on the fresh water environments of western North America through increases in temperature and changes in precipitation patterns. These changes will almost certainly increase environmental stressors for salmonids, which is likely to negatively impact bith ecosystems and the human economies that rely on them. Thus it is crucial to understand potential responses of salmonids to the challenges posed by the global climate change. An important step in achieving this understanding is measuring the present status of genetic adaptation of salmonids to temperature and the degree of plasticity in their response to temperature changes.

The primary purpose of my project is to measure the effect of temperature variation on body shape in rainbow trout from different thermal habitats. A preliminary study of three populations raised at temperatures of 12°C and 18°C showed that an increased rearing temperature significantly affected trout body shape. The change in shape change was different between the different lines. Our results give evidence that the fish possess a genome due to environmental interaction, since the different lines react to the change in temperature in different ways.

The results of this project indicate that warming waters will cause a change in the body shape of rainbow trout. It is expected that this change in shape may cause changes in locomotion and feeding patterns. Changes such as these would have a direct impact on overall fitness. The differences amongst genotypes suggest that some genotypes will adapt better than others. Varying adaptation levels may lead to a reduction in overall population in the face of increasing temperatures.

Presentation Number 94

Abstract Title:	**Exposure Of DEHP to Gestating Mouse Dams affects Mitosis and Meiosis of Male Germ Cells in the F3 Generation Progeny**		
Presenter:	Joseph Lawhead		
Mentor:	Kwan Hee Kim		**Honors:** No
Co-Authors:	Doyle TJ, Kim KH		
Presentation Type:	Poster	**College:** College of Veterinary Medicine	**Major:** Microbiology
Category:	Molecular, Cellular, and Chemical Biology		

ABSTRACT:

Phthalates are common plasticizers that confer flexibility and transparency to plastics, and readily contaminate the environment and the body. Work in the literature has linked human phthalate exposure to abnormal reproductive and hormonal effects. We have shown previously that exposure to Di-2-(ethylhexyl) phthalate (DEHP) in mouse dams of the F0 generation disrupted testicular germ cell organization and spermatogonial stem cell (SSC) function in the F3 generation progeny. In this study, we have elucidated if the abnormal phenotypes arise from a defect in the spermatogonial differentiation and meiosis during the first wave and the second wave of spermatogenesis. Gonocytes in the first wave of spermatogenesis differentiate directly into A_1-A_4 differentiated spermatogonia, whereas in the second and subsequent waves, gonocytes first become stem cells and then divide to form undifferentiated and differentiated spermatogonial populations. Gestating mouse dams were exposed to corn oil vehicle (CO) or to DEHP from embryonic day 7 to 14 and progeny were mated for two generations to obtain F3 generation offspring. The testes of F3 generation mice from the CO and DEHP exposed groups were characterized at postnatal day 3 (P3) to investigate the spermatogonial differentiation from the first wave of spermatogenesis, at P7 to investigate meiosis from the first wave of spermatogenesis and the second wave of spermatogonial differentiation, and at P14 to investigate the second wave of meiosis. At P3, P7, and P14, an increase in cells positive for PHH3 (a marker for mitosis) in the testis from the DEHP populations was observed, when compared to the testis from the CO group. At P7 and P14, an increase in cells positive for Stra8 and γH2AX (markers for spermatogonial differentiation and meiotic cells, respectively) was observed in the testes from the DEHP group. These results are in agreement with a higher number of cells positive for GCNA1 (general germ cell marker) in the testis of the DEHP group compared to the testis of the CO group. In conclusion, DEHP has a transgenerational effect on male germ cells, increasing mitosis and meiosis in both the first wave and second wave of spermatogenesis.

Presentation Number 96

Abstract Title:	**A New Generation of Fe-enhanced Compost for Soil Remediation**		
Presenter:	Jonathan Abarca		
Mentor:	Zhenqing Shi and James Harsh		**Honors:** No
Co-Authors:	Zhenqing Shi, James Harsh, Jeffrey Boyle		
Presentation Type:	Poster	**College:** College of Agricultural, Human, and Natural Resources	**Major:** Fruit and Vegetable Management
Category:	Engineering and Physical Sciences		

ABSTRACT:

Lead arsenate had been heavily used as an insecticide to control codling moth infestations in apple orchards for decades in Washington State. Although the use of this insecticide has been discontinued, soils where it was applied suffer from high concentrations of Pb and As; both harmful to human health and plant development. The current study evaluated an innovative compost enriched with Fe and its capacity in immobilizing Pb and As in contaminated soil. This approach is taken on the basis that the iron in the compost will adsorb both Pb and As in the contaminated soils reducing their bioavailability for plant uptake or leaching into groundwater. Based on acid/base titration experiments, we quantified the total reactive sites in Fe-compost samples, which are responsible for removing both cation (e.g. Pb) and oxyanion (e.g. As) pollutants from water. To determine the capacity of the enriched Fe compost on adsorbing As and Pb, adsorption isotherms and adsorption edges were conducted on compost samples. Phosphorous, an element with similar properties to As, was used in the experiments instead of As as a non-toxic substitute. Incubation experiments were conducted to determine the reactivity of Fe compost with Pb in contaminated soils at field moisture capacity and room temperature. At selected incubation times, soil samples were extracted with 0.01 M $CaCl_2$, which extracts Pb that is likely to be available to living organisms. Amendment with Fe-compost significantly decreased Pb concentrations in the soil water of the field contaminated soil, compared with that without any Fe-compost amendment.

Presentation Number 97

Abstract Title:	**Accounting for Subject Size and Posture Affects the Predictions of Biomechanical Models**		
Presenter:	Ellis Hughes, Steven Monda, Victor Small		
Mentor:	Anita Vasavada		**Honors:** No
Co-Authors:	David Lin, Anita Vasavada		
Presentation Type:	Poster	**College:** College of Engineering and Architecture	**Major:** Bioengineering
Category:	Engineering and Physical Sciences		

ABSTRACT:

Musculoskeletal models are used to make predictions of the biomechanics of the human body, especially in gait and posture studies. In our lab, we use musculoskeletal models to predict the mechanical demand on the neck during tablet-computer use. Mechanical demand has been defined as the ratio of the strength necessary to support the weight of the head, relative to total strength of the neck muscles. We previously investigated the effect of vertebral posture on mechanical demand (Vasavada et al., 2013). This approach required several simplifications that potentially altered results, and failed to account for differences in sex, head weight, and neck muscle strength. To examine the effects of both subject size and posture, we generated two new musculoskeletal models with photographic and radiographic data collected from 29 subjects (15 male, 14 females) in their neutral posture as well as several tablet-computer usage postures. The first model (photographic model) was made using angles of the torso, neck and head from photographic data. Vertebral angle estimates were made using prior methods (Nevins *et al.*, 2013). Our next model (subject scaled model) was made by scaling the current 50th percentile male model to account for the differences in subject size and vertebral posture. From data collected about subjects' sex, head circumference, neck circumference and radiographs, the models represented individuals' vertebral positions, vertebral angles, head mass and position, and more accurate muscle parameters used to calculate mechanical demand. We found that all of the subject scaled models had mechanical demand predictions that were significantly different from the than the photographic models ($p<<.001$, paired t-test). These results indicate that the size and posture differences have a significant effect on the predictions of the biomechanical models.

Presentation Number 98

Abstract Title:	**Developmental Effects of Roadside Proximity in Reproductive Morphology of Juvenile Lithobates Sylvaticus**		
Presenter:	Brandon Hutzenbiler		
Mentor:	Erica Crespi		**Honors:** No
Co-Authors:			
Presentation Type:	Poster	**College:** College of Arts and Sciences	**Major:** Zoology
Category:	Organismal, Population, Ecological, and Evolutionary Biology		

ABSTRACT:

Environmental and anthropogenic factors associated with global amphibian die-offs have been widely documented, yet uncertain still is the additional influence of disease on the interaction between immunological and reproductive systems. Wood frog (*Lithobates sylvaticus*) juveniles from ephemeral roadside and woodland ponds were captured and exposed to varying doses of an emerging infectious disease, ranavirus, in order to study and evaluate abnormal responses manifesting in reproductive morphology. Inadequate environments have been shown to induce a life-history trade-off between immune function and reproduction. We predict harsh roadside environments will negatively influence reproductive efforts through diminished gonadal development so as to maintain sufficient immune function when challenged with disease. Histological sections of male gonads will be analyzed for size (as proportional to body length) abnormalities and size of spermatic cysts. We will test the effects of distance to road and other conditions of the larval environment on these measures of reproductive effort in relation to infection intensity. Additionally, the presence of an unidentified intestinal nematode demonstrated increased mortality rate and higher ranavirus titers in co-infected individuals. Results from this study will contribute to understanding the dynamic relationships between amphibian populations, environment and disease.

Abstract Title:	**Electron Transfer Mediator increases Production of 1,3-Propanediol in Bioelectrochemical Reactors**		
Presenter:	Vi Tran		
Mentor:	Dr. Haluk Beyenal		**Honors:** No
Co-Authors:	Tim D. Harrington, Dr. Haluk Beyenal		
Presentation Type:	Poster	**College:** College of Engineering and Architecture	**Major:** Bioengineering
Category:	Engineering and Physical Sciences		

ABSTRACT:

Introduction: 1,3-Propanediol (1,3-PDO) is a valuable chemical used in the manufacture of adhesives and polyesters and is traditionally derived from crude oil. A new method of producing 1,3-PDO involves biochemical conversion of glycerol, a cheap byproduct of biodiesel production, through the use of bacterial fermentation. Glycerol fermentation follows a branched metabolic pathway that is controlled by the NADH/NAD+ ratio inside of fermenting cells. Our goal is to increase the production of 1,3-PDO by employing electrical energy and an electron transfer mediator (ETM) to increase the ratio of $NADH/NAD^+$, thereby enhancing carbon flux toward 1,3-PDO at the expense of the other end-products of glycerol fermentation.

Materials and Methods: Bioelectrochemical reactors, the bacteria *Klebsiella pneumoniae*, a soluble ETM, peptone, yeast extract, glycerol (PYG) growth media, cation exchange membranes, UV-Vis spectrophotometer, a potentiostat and a High Performance Liquid Chromatograph (HPLC) were used. One compartment of the reactor was filled with PYG media that included pre-oxidized ETM, was bubbled with nitrogen gas and included a custom designed electrode. The opposing chamber was filled with buffering solution and contained reference and graphite rod counter electrodes. Some of the reactors were polarized overnight to reduce the ETM. Immediately prior to inoculation the polarization was either stopped or left to continuously reduce the ETM.

The reactors were inoculated with *K. pneumonia* and the OD taken after inoculation and hourly thereafter for 12+ hours to track the microbial growth. Then the samples were centrifuged at 10,000 rpm to spin out the bacterial cells, and the supernatant analyzed for 1,3-PDO.

Results and Discussion: The supernatants were analyzed using HPLC to determine the effect of ETM and its oxidation state on 1,3-PDO and glycerol concentrations. The *K. pneumoniae* in the continually reduced ETM reactors produced 10% more 1,3-PDO when compared to the control reactors that had no ETM.

Conclusions: Overall, the addition of ETM enhanced the productivity of the fermentation. The reduced ETM yielded the highest amount of 1,3-PDO. These results are consistent with the hypothesis that increasing the ratio of $NADH/NAD^+$ with an electron mediator is able to shift the carbon flux towards the production of 1,3-PDO.

Presentation Number 100

Abstract Title:	**Latina Mothers' Influences on their Children's Self-Regulation of Energy Intake**		
Presenter:	Karina Silva		
Mentor:	Dr. Thomas Power		**Honors:** No
Co-Authors:	Dr. Thomas Power		
Presentation Type:	Poster	**College:** College of Agricultural, Human and Natural Resources	**Major:** Human Development
Category:	Social Sciences		

ABSTRACT:

This study examines low-income Latina mothers' influences on their preschool aged children's self-regulation of energy intake through their interactions during a buffet meal. Little research addresses the minority population in regards to their children's self-regulation of energy intake. Poor self-regulation is associated with childhood obesity, and low-income minority children are at high risk for obesity. This research attempts to understand the parenting styles of Latina mothers and their relationship with children's self-regulation and eating behaviors. One hundred and eighty-six videos will be coded observing Head Start Latina mothers during a meal with their children in a laboratory setting. Based on the literature on parenting and self-regulation, it is predicted that both high and low levels of restriction and control during eating will be associated with the poorest self-regulation of energy intake in children.

Presentation Number 101

Abstract Title:	**Discovering the Genetics of (-)-pinoresinol in Flax Seeds**		
Presenter:	Mia Ryckman		
Mentor:	Norman Lewis		**Honors:** Yes
Co-Authors:	Kye-Won Kim, Paul Ziegler, Laurence B. Davin and Norman G. Lewis		
Presentation Type:	Poster	**College:** College of Arts and Sciences	**Major:** Biology/pre med
Category:	Molecular, Cellular, and Chemical Biology		

ABSTRACT:

Flax seeds can help protect the onset of certain cancers such as prostate or breast cancer. They have the power to do this due to their ability to produce compounds called oligomeric lignans, more commonly known as phenolic substances, especially (+)-secoisolariciresinol diglucoside (SDG). The biosynthetic pathway of SDG is proposed to have a class of proteins named dirigent proteins that have been found in other plant species such as *Forsythia intermedia*, *Thuja plicata*, and *Schisandra chinensis*. Dirigent protein controls the coupling of monolignols, a source material for lignans. For instance they bind a substrate and orient so that once coupling reactions have occurred only a stereoselective lignan, the (+)-pinoresinol, is formed. However, the lignan found in Arabidopsis thaliana and now in flax seeds, expected the formation of (+)-pinoresinol, has genes that encode similar dirigent proteins that have proven difficult to discover. Instead of using methods that have not provided good results such as protein purification and gene cloning by PCR, this research project will work to solve this mystery, moving to the direction of *in silico* analysis and over-expressing the candidate genes of interest using tomato cell culture system and characterize their activities. With the information regarding the (+)- and (+)-pinoresinol forming dirigent proteins of *Arabidopsis thaliana* and also recent the genomic information of flax, seven putative dirigent proteins have been identified and named LuDP1-LuDP7. Among them three genes were studied and discovered two genes LuDP6 and LuDP7 are involved specifically in the formation of (+) pinoresinol. The investigation into the biochemical properties and gene expression of these two genes is a vital step for illuminating lignan biosynthesis in flax.

Presentation Number 102

Abstract Title:	**The Benefits of a Growth Mindset on Statistics Anxiety and Statistics Self-Efficacy**		
Presenter:	Misa Shimono		
Mentor:	Dee Posey		**Honors:** No
Co-Authors:			
Presentation Type:	Poster	**College:** College of Arts and Sciences	**Major:** Psychology
Category:	Social Sciences		

ABSTRACT:

Previous research has shown that academic performance is affected by the mindset students hold. As Stanford's Carol Dweck has defined it, those with fixed mindsets believe their abilities are innate and unchangeable, and tend to perform poorly in challenging situations that threaten their perceived fixed ability level, while those with growth mindsets believe their abilities are malleable and improvable, and rise to the challenge to grow their ability level. Given that a large majority of undergraduate psychology students experience statistics anxiety, the required statistics class is a challenge with which these students must contend. We asked whether manipulating students' mindset would beneficially affect their statistics anxiety (a strong predictor of statistics performance), their statistics self-efficacy, and their endorsement of a growth mindset. In a multi-part experiment spanning fall semester, students in a psychology statistics class were measured on these variables and then presented with information supporting a growth mindset about either quantitative reasoning skills (QR), which are related to facility with statistics, or about emotional intelligence and helping skills (EQ), which should have no effect on mindset about statistics. As expected, endorsement of a growth mindset significantly increased following the manipulation; however, contrary to expectations, both QR and EQ groups increased their growth mindset about both QR and EQ skills rather than just on the skill about which they'd been presented information. Likewise, the expected increases in statistics self-efficacy and decreases in statistics anxiety were largely the same in both groups. This result could indicate that psychology students' attitudes about their QR and EQ skills are not as independent as we predicted, such that growth mindset information presented on one topic spilled over into their general attitude about their school- or psychology-related abilities rather than staying confined to one ability set. If this were the case, it would challenge the prevailing view that mindsets about different skills are independent and argue that mindsets about some skills do indeed overlap. Determining which ones overlap would help teachers streamline the teaching of a growth mindset to only a highly impactful core set rather than an unsystematic array of potentially overlapping sets.

Presentation Number 103

Abstract Title:	Media Filter Drain: Modified and Existing Design Evaluation		
Presenter:	Justin Rath, Brandon Werner		
Mentor:	Liv Haselbach		**Honors:** No
Co-Authors:	Agathe Thomas, Victor Small, Jacob Inderbitzin, Brandon DeChiara		
Presentation Type:	Poster	**College:** College of Engineering and Architecture	**Major:** Civil Engineering
Category:	Engineering and Physical Sciences		

ABSTRACT:

The research I am working on involves collecting data for the Washington State Department of Transportation. The experiments I perform determine the quality of various pervious concrete samples by applying man made rainwater and storm water to conclude the absorption ability of the concrete. By collecting influent and effluent (water going into and out of the concrete columns), the data provides my faculty mentor and I a good idea of the chemicals that the columns absorb. It is also my responsibility to formulate and make the rainwater and storm water solution. Data is sent to a lab and it is my job to interpret, analyze, and record the data.

Recently, the Washington State Department of Transportation came up with a new formula which they would like their pervious concrete samples to be composed. I am fortunate enough to be the undergraduate responsible for doing research on this newly formulated concrete.

Presentation Number 104

Abstract Title:	**Invasive Phragmites australis**		
Presenter:	Alexander Schumacker		
Mentor:	Rebecca Holcomb		**Honors:** No
Co-Authors:	Rebecca Holcomb; Dr. David Gang		
Presentation Type:	Poster	**College:** College of Arts and Sciences	**Major:** Molecular Plant Biology
Category:	Molecular, Cellular, and Chemical Biology		

ABSTRACT:

Phragmites australis, a species of grass, has varieties native to North America and others native to Europe. A recently introduced European variety, named haplotype M, has been documented to out-compete the less efficient native varieties in North America. Finding out the subtle differences between each variety, or haplotype, will help map out how the invasive *P. australis* patches evolve further. It has been shown that the invasive haplotype can create more efficient rhizome systems, allowing for budding to occur effectively. With such high reproduction rates, mutations can happen often. This allows patches to evolve into more specialized organisms for the environment they reside in. Also one of the many advantages invasive *P. australis* has resides in its efficient metabolism, enabling successful reproduction. After preliminary analysis, it appears that the invasive species has developed a new competitive strategy via allelopathy. Testing the invasive *P. australis* will reveal the compound that affects ecosystems so dramatically. Its proficiency in soil or water can depend not only on the compound it releases, but also how well that chemical spreads in different growing mediums. Using soil grown specimens will create solid growing medium to test for compounds excreted from *P. australis*. A hydroponic setup allows for a system to filter out the compound in water. In addition, using a stir bar sorptive extraction method (SBSE) will enable efficient and cheap extraction of any exuded metabolites from the invasive *P. australis*. This technique, once enhanced, will enable the collection of multiple samples in the field, aiding the comparison of the different chemicals exuded either by native or invasive *P. australis*. Upon collection, chromatography analysis will efficiently separate the metabolite profiles and mass spectrometry will reveal the chemical composition of the different parts of the varieties of *P. australis*. Also, testing of invasive *P. australis's* effect on different stages of native plant development will give insight to the whole story of this invasion. *P. australis's* economic and ecological importance throughout the world, reassure the need to establish government protocol to ensure the native population's survival while allowing for the other native wildlife to thrive.

Presentation Number 105

Abstract Title:	**Fabricating a Community**		
Presenter:	Wanjiru Ndambiri		
Mentor:	Kathleen Ryan		**Honors:** No
Co-Authors:			
Presentation Type:	Poster	**College:** College of Agricultural, Human, and Natural Resources	**Major:** Interior Design
Category:	Arts and Design		

ABSTRACT:

Maker-spaces or Fabrication Labs are quickly becoming a place where people can collaboratively work on complex projects or on crafts. They are community workshops that offer classes and are equipped with laser cutters, 3D printers, woodworking tools, specialized machinery and more vernacular supplies for arts and crafts. The popularity of Fab Labs may be strongly correlated with the Third Place theory. This is the theory that people feel secure and comfortable enough to work or relax in a place other than their home or traditional workplace.

Key factors to the success of fabrication labs are their location and affordability. Some fabrication labs are situated within libraries or similar civic institutions allowing them to work with their membership systems, as well as making them easily accessible to the transportation needs of the community. Fab Labs are places where families can interact but is also appealing to adults or youth. This type of flexibility allows people to form social relationships on a face-to-face basis especially in this technological age.

Discovering the demand and use for fabrication labs was accomplished through a series of case studies, workshops and research on third place theory. The case studies prepared by the Interior Design students were based on Fab Labs around the world. The results further justified the growing need for fabrication labs as an escape from environments that would taint the youth or a release from the mundane routine of life. A strong sense of place and ownership through design was apparent in most cohesive communities and fabrication labs would flourish in such communities.

As a result of these findings our Interior Design studio was able to integrate a Fab Lab into an ongoing rural community library design project. The inclusion of a Fab Lab into this rural project will meet the needs of the community through the opportunities for innovation. Fabrication Labs have a universal appeal as it is one of the few places that are inviting to anybody. Their goal is to fortify the community's sense of belonging and unification through a creative and educative experience.

Presentation Number 106

Abstract Title:	**Variations in Energy, CO2, and Water Transport and Storage of Burned and Unburned Agricultural Fields in the Pacific Northwest**		
Presenter:	Laurel Graves		
Mentor:	Shelley Pressley		**Honors:** No
Co-Authors:	Shelley Pressley, Sarah Waldo, Jinshu Chi, Patrick O'Keeffe, Brian Lamb		
Presentation Type:	Poster	**College:** College of Engineering and Architecture	**Major:** Civil Engineering
Category:	Engineering and Physical Sciences		

ABSTRACT:

The Regional Approaches to Climate Change (REACCH) project has the goal to develop ways to adapt to and mitigate climate change effects in Pacific Northwest Agriculture. One part of this effort is monitoring the greenhouse gas balance of cereal cropping systems. Currently, there are five micrometeorological flux tower sites set up across various fields in the Pacific Northwest where continuous measurements are conducted of meteorological parameters and atmospheric fluxes (i.e. carbon dioxide (CO_2), water, energy). In September of 2012, a fire was started accidentally at a field near Moscow Mountain in Moscow, Idaho at the location of one of these flux towers. While this fire was an accident, agricultural field burns are common practice having a larger and more widespread impact on the field and the region. Thus, having a fire event within the footprint of one of the flux towers presented a unique opportunity to consider how fire might impact carbon, water and energy storage during both the dormant and growing season at sites in the same region, which have varying field characteristics. By observing not only the Moscow Mountain site but all five REACCH locations variations can be quantified to find the capacity to store exchanges of CO_2, water, and energy among burned and unburned fields. Analysis will also include short-term vs. long-term effects of the fire on the ecosystem.

Presentation Number 107

Abstract Title:	**Sex Differences in the Rewarding and Antinociceptive Effects of Morphine Using Conditioned Place Preference Procedure**		
Presenter:	Anne Cervenka		
Mentor:	Dr. Rebecca Craft		**Honors:** No
Co-Authors:			
Presentation Type:	Poster	**College:** College of Veterinary Medicine	**Major:** Neuroscience
Category:	Organismal, Population, Ecological, and Evolutionary Biology		

ABSTRACT:

Women have been shown to be more likely to acquire painful diseases, yet most pain studies using animal models utilize exclusively male animals, despite the fact that males and females react differently to many painkillers. Male and female rats have been found to react differently to morphine, with one important variable being the presence of pain. Tests were conducted on the hypothesis that female rats are more influenced than male rats by the rewarding effect of morphine, but the females will not be more influenced than males by the affective pain relief. The conditioned place preference procedure was used to get rats to associate a stimulus area with morphine for either reward or pain relief. Time spent in the stimulus area during a testing trial was measured to determine the amount of preference the rat showed for the associated morphine induced state. Inflammatory pain was induced by Complete Freud's Adjuvant injected into the right hind paw of the rat. A dose effect curve was visible in the females, but there was no clear dose effect curve in the males. Error was too large in both sexes to determine whether female rats were more sensitive than males to the rewarding effects of morphine. The error may have been a result of too few conditioning trials being conducted to cause a strong association between the drug state and the stimulus area. Further research is being conducted with an increase in conditioning trials from one to three days in an effort to decrease the data spread. The research was conducted in the laboratory of Dr. Rebecca Craft and under the mentorship of Seth Davis.

Presentation Number 108

Abstract Title:	**Cardiomyopathy Mutation, F72L, in Rat Cardiac Troponin T Attenuates both the Ca2+ Sensitivity and the Magnitude of the Length-Mediated Cardiac Muscle Activation**		
Presenter:	Vikram Chandra		
Mentor:	Dr. Murali Chandra		**Honors:** Yes
Co-Authors:			
Presentation Type:	Poster	**College:** College of Engineering and Architecture	**Major:** Bioengineering
Category:	Molecular, Cellular, and Chemical Biology		

ABSTRACT:

Cardiac muscle activation is a result of interactions between many thick and thin filament proteins. The normal interactions between this complex network of proteins are vital for the healthy heart muscle function. However, disease-causing mutations in any protein may alter such protein-protein interactions to modulate the muscle function. Cardiac troponin T (cTnT) is an important thin filament regulatory protein, which strongly interacts with tropomyosin (Tm) to modulate the extent of muscle activation. Studies show that the site for strong interaction of cTnT with Tm is a hotspot for nearly 70% of the cardiomyopathy mutations. However, how disease-causing mutations near or within the Tm-binding region lead to cardiac muscle dysfunction remains poorly understood. Our study focuses on a novel cardiomyopathy-related mutation, F70L, which lies near this region of cTnT. We hypothesized that mutations near the Tm-binding region lead to cardiac dysfunction by modulating the speed and magnitude of crossbridge (XB; actin-myosin) interactions. We generated a recombinant rat cTnT analog ($cTnT_{F72L}$) of the human cardiomyopathy mutation, F70L, using mutagenesis techniques. Recombinant $cTnT_{F72L}$ or wild-type rat cTnT ($cTnT_{WT}$) was reconstituted into detergent-skinned mouse cardiac papillary muscle fibers to measure steady-state functional parameters such as tension, ATPase activity, and myofilament Ca^{2+} sensitivity. Dynamic muscle function of $cTnT_{F72L}$- and $cTnT_{WT}$-reconstituted fibers was assessed by fitting an interpretive model to the force responses of muscle length changes. $cTnT_{F72L}$ significantly attenuated both the myofilament Ca^{2+} sensitivity and the speed of length-mediated XB attachment (b) by ~20%. However, the speed of length-mediated XB detachment (c) was higher by 20% in $cTnT_{F72L}$ fibers. Furthermore, the magnitude of length-mediated muscle activation (E_R) was lower by 47% in $cTnT_{F72L}$ fibers. Our observations suggest that a decrease in b (possibly due to a negative impact of F72L on the cTnT-Tm interactions) paired with an increase in c may be the underlying cause for attenuation in both the myofilament Ca^{2+} sensitivity as well as the length-mediated muscle activation. We envision that unique insights into the underlying pathological mechanisms may aid us in devising cardio-protective strategies to minimize the negative effect of F70L mutation in human cTnT on heart muscle function.

Presentation Number 109

Abstract Title:	**Effect of the Gpc-B1 Allele On Grain Protein Concentration in Hard Red Winter Wheat (Triticum aestivum L.) in the Pacific Northwest of the US**		
Presenter:	John Kuhn		
Mentor:	Dr. Arron Carter		**Honors:** No
Co-Authors:	Dr. Arron H. Carter		
Presentation Type:	Poster	**College:** College of Agricultural, Human and Natural Resources	**Major:** Agricultural Biotechnology
Category:	Applied Sciences		

ABSTRACT:

Grain protein concentration (GPC) influences end-use quality of products made from wheat (*Triticum aestivum* L.); therefore, this trait is commonly a high priority for breeders. However, most variation in GPC is due to variability in the environment, instead of genetics effects. In addition, GPC and grain yield are negatively correlated. Due to the negative correlation between yield and GPC, and the high variation caused by the environment, enhancing genetic expression of this trait will be important to improving grain protein concentration in hard wheat varieties. Previous studies have shown varying results in spring wheat in regards to increasing GPC, with some studies increasing GPC by up to 1.5%. The objective of this study was to evaluate the *Gpc-B1* allele in hard winter wheat cultivars. Near-isogenic lines (NIL) with and without the *Gpc-B1* allele were created in four populations: Farnum by Lassik, WA8061 (an advanced breeding line) by Lassik, Farnum by Hollis, and Farnum by Eddy. Presence of this allele was validated using the diagnostic marker *Xuhw89*. Field trials were planted in Pullman and Lind, Washington under a randomized complete block design which included NIL and check cultivars with and without the *Gpc-B1* allele. These two locations differ by annual rainfall averages and yield potential. Results indicate that the inclusion of the *Gpc-B1* allele for high GPC in hard red winter wheat does increase GPC, although genetic background does play a role. A negative correlation with grain yield and GPC was found, showing inclusion of the *Gpc-B1* allele significantly decreased grain yield potential. Interestingly, the Farnum by Hollis NIL with the *Gpc-B1* allele showed not only high GPC, but also higher grain yield potential than the NIL without this allele. These data demonstrate that inclusion of the *Gpc-B1* allele increases GPC in the tested hard red winter lines, and that the well-known negative correlation between GPC and grain yield can be selected against.

Presentation Number 110

Abstract Title:	**Characterization of a Noninvasive Lameness Model in Dogs**		
Presenter:	Stephanie Washburn		
Mentor:	Dr, Steve Martinez		**Honors:** Yes
Co-Authors:	Dr. Steve Martinez, Kelly Nansen		
Presentation Type:	Poster	**College:** College of Agricultural, Human, and Natural Resource	**Major:** Animal Science
Category:	Organismal, Population, Ecological, and Evolutionary Biology		

ABSTRACT:

Currently there is only one way to evaluate the efficacy of a nutriceutical, drug, or therapy in a lame animal. This is through acquiring animals with naturally occurring lameness or surgically inducing lameness in the animal in order to qualify as a desired subject for a study. This temporary model of canine lameness that is being looked into may prove to be useful for evaluating other treatment and therapies for lameness in the future without the need of recruiting lame animals or the use of surgical procedures. In addition to evaluating this model of lameness, we will also be drawing blood in order to help provide information about the bioavailability of the medication (Tramadol) throughout the study at different time points. The Tramadol will be dosed at 5 milligrams per kilogram and a week later at 10 milligrams per kilogram. Through the use of healthy, client owned dogs we will attempt to simulate lameness in canines and examine the pharmacodynamics of Tramadol.

In order to test this noninvasive model of lameness a jack will be vet-wrapped to either the right or left metatarsal and metacarpal pads, as decided at random, in order to induce a state of lameness in the dogs. At different times there will be a jack in either the metatarsal or metacarpal pad. The dogs will then be walked across a force plate in order to gather data that shows how much force is exerted by each paw during walking and how the force exerted changes when a dog is lame. The visual analogue scale for lameness will also allow a trained veterinarian to determine to what extent the canine is lame. Lastly the pharmacodynamics of Tramadol will help relieve the pain and blood will be collected in order to determine the rate at which it is metabolized throughout the body. Blood and force plate data will be collected at time 0, time 1.25, time 2.5, and time 3.75.

Presentation Number 111

Abstract Title:	**Multiple Attachments amongst the Ngandu of the CAR**		
Presenter:	Michelle Taylor		
Mentor:	Dr. Courtney L. Meehan		**Honors:** No
Co-Authors:	Dr. Courtney L. Meehan		
Presentation Type:	Poster	**College:** College of Arts and Sciences	**Major:** Anthropology
Category:	Social Sciences		

ABSTRACT:

This project focuses on the role and effect of multiple attachments and cooperative caregiving on Ngandu infants and children of the Central African Republic (CAR). While attachment to multiple caregivers has long been recognized, there is a dearth of empirical research on the topic. This project provides much needed data that addresses the questions central to attachment theory, exploring attachment behaviors, such as touching, speaking to, and proffering, and relationships beyond the mother-child dyad. An examination of non-maternal attachment relationships provides an opportunity to explore the implications of forming relationships within a community. We hypothesize that children form attachment relationships with multiple individuals within their communal networks and that these relationships will have a marked impact on early childhood development, emotional regulation, and internal working models. For this project, Ngandu children between the ages of six and forty-eight months have been examined regarding their multiple attachment relationships across kin, non-kin, age, and sex categories. Furthermore, we hypothesize that while there is intra-cultural variation, multiple non-maternal caregivers will be responsive and sensitive to child attachment displays. This exploration of children's attachment relationships and caregivers' responsiveness enables us to evaluate the role of all caregivers in the experiences and socioemotional development of children. This project expands the current attachment research by examining a child's complete social network and has the potential for future research, furthering as aspect of evolutionary anthropology in need of greater academic exploration.

Presentation Number 113

Abstract Title:	**Disruption of Non-Classical Progesterone Signaling in the Uterus Leads to Progression toward Endometrial Cancer**		
Presenter:	Nicole Clark		
Mentor:	James Pru		**Honors:** No
Co-Authors:	Pru CA, McCallum ML, Yee SP, Sanders MM, DeMayo FJ, Lydon JP, Peluso JJ, Pru JK		
Presentation Type:	Poster	**College:** College of Veterinary Medicine	**Major:** Biochemistry
Category:	Molecular, Cellular, and Chemical Biology		

ABSTRACT:

Progesterone (P4) is a sex steroid hormone that is required for female fertility. P4 functions to suppress cell proliferation in the female reproductive tract. Disruption of P4 signaling can lead to women's reproductive diseases like infertility, cancer, and endometriosis. P4 exerts its effects by activating the classical progesterone receptor (PGR). However, studies with *Pgr* null mice indicate that not all of the actions of P4 are mediated by PGR, since *Pgr* null mice still respond to P4. Progesterone receptor membrane components 1 and 2 (PGRMC1 and PGRMC2) are novel P4 signaling molecules that regulate survival and proliferation of uterine, ovarian, and breast cells. Abnormal PGRMC1 expression is associated with premature ovarian failure, polycystic ovarian syndrome, and female reproductive cancers. Transgenic mouse lines were generated in which *Pgrmc1*, *Pgrmc2*, or both genes were deleted from the female mouse reproductive tract through conditional mutagenesis. In addition to a pregnancy defect leading to smaller litters, these mice develop uterine cystic hyperplasia, a pre-cancerous condition, and, in some cases, endometrial cancer. Thus, these *Pgrmc1/2* knockout mice may serve as a model for how abnormal P4 signaling in the uterus progresses toward endometrial cancer. To investigate the potential mechanism for how *Pgrmc1* depletion leads to cancer, we examined the expression of markers for proliferation (Ki67) and autophagic cellular recycling (LC3) in knockout and control uteri. In addition, we established that siRNA knockdown of *Pgrmc1* in endometrial cancer cells prevents the cells from responding to the anti-proliferative effects of P4. Thus, disruption in P4 signaling via PGRMC1/2 may enable the uncontrolled cellular accumulation that leads to hyperplasia and cancer. Understanding the mechanistic roles of PGRMC1/2 in uterine function will enable future development of therapeutic strategies that target these signaling molecules in order to treat women's reproductive diseases.

Presentation Number 114

Abstract Title:	**Views through a Void: Light and Connection to Place**		
Presenter:	Miranda McCrory		
Mentor:	Kathleen Ryan		**Honors:** No
Co-Authors:			
Presentation Type:	Poster	**College:** College of Agricultural, Human, and Natural ResourcesS	**Major:** Interior Design
Category:	Arts and Design		

ABSTRACT:

An atrium within an office building interior now sits enclosed and uninhabitable. The site, located on a research university in the Pacific Northwest, remains untouched two years after a recent football stadium expansion. When a significant remodel to a workplace changes the characteristics of the space, considerations should be made to occupants who remain. The offices adjacent to the former atrium are now portals to an abandoned space with views to other offices across the darkness. Daylight and views may not be required to do work but it can be argued that daylight and views contribute to worker satisfaction.

The space can no longer provide views to nature or daylight, but it can return to a space for people to gather and retreat. The feeling of openness and light can be recreated through light design strategies. Students interviewed the workers to understand the change in the workplace for those in the affected offices. Workers described how they used the area prior to the construction, and how workplace satisfaction and use of the atrium had changed since the atrium was closed off to daylight. While atriums have traditionally provided views to nature and daylight into interiors of buildings, the physical configuration of the enclosed space can no longer offer daylight and the views are considered "unsatisfactory" through site observations of current conditions and occupant response to interview questions.

Interior Design students used the physics of light and case studies of atrium spaces to devise design solutions. Students used the remnants of the atrium's central location, adjacency to the lobby, and large windows to develop new designs to respond to the atrium characteristics of daylight and openness. The design solutions responded to occupant's decreased use and satisfaction, to propose effective design solutions. The 'atrium' was re-imagined by Third Place Theory of personal connection, location, entrance and path to regain characteristics of an atrium space. Aspects of the former atrium were incorporated within a new design: to create a central focal point, light and spatial design for gathering. The resulting designs promote human interaction, retreat, user experience and satisfaction within the workplace.

Presentation Number 115

Abstract Title:	**Effect of Playful Handling on Laboratory Rats in Reducing Stress Associated with Blood Collection**		
Presenter:	Chelsea Martin		
Mentor:	Sylvie Cloutier		**Honors:** No
Co-Authors:			
Presentation Type:	Poster	**College:** College of Veterinary Medicine	**Major:** Biochemistry
Category:	Organismal, Population, Ecological, and Evolutionary Biology		

ABSTRACT:

Collection of blood from laboratory animals is frequently necessary for a variety of experimental uses including determination of pharmacokinetics, antibody production, clinical pathology evaluation and monitoring of hematotoxicity. Laboratory animals, such as rats, can be stressed by the blood collecting process. In addition to the pain caused by the needle used to puncture the blood vessel, the rat also experiences stress from being restrained in order to obtain the sample. Experiencing these stressors can have long term effects on the rat's mental health and alter an experiment's outcomes. Playful handling, or "tickling", which mimics rat's social play, puts the rats in a positive state of mental health and reduces fear of humans. The hypothesis tested was that experiencing tickling prior to blood sampling reduces stress levels and negative effects on the rat's mental health. To investigate the effects of tickling on the response of laboratory rats to blood sampling, female and male Long-Evans rats over 30 days of age (N=192) were habituated to tickling, or not handled, for two minutes daily for three days prior to sampling. They were assigned to one of two blood collection treatments administered once in each of two consecutive weeks: (1) Tickling immediately followed by blood collection; (2) no handling followed by blood collection. Rat responses on collection days were investigated by measuring production of 50- and 22-kHz ultrasonic vocalizations (USVs) (associated with positive and negative emotional states, respectively), and audible vocalizations (associated with aversive situations) during the procedure. What was discovered was that rats tickled immediately before sampling produced more 50-kHz USVs compared to those not tickled. Habituation to tickling had no effect. Over the two sampling days, audible calls were reduced in tickled rats in comparison to those not handled. Production of 22-kHz USVs was not affected by treatment. In conclusion, tickling immediately before blood sampling induces a positive affective state in laboratory rats during the procedure. Thus, tickling could be used to refine blood sampling procedure and improve rat welfare.

Presentation Number 116

Abstract Title:	**Electrolyte Leakage and Lipid Peroxidation as Indicators of Freezing Tolerance of Wheat Plants**		
Presenter:	Cecilia Cuevas		
Mentor:	Daniel Z. Skinner		**Honors:** No
Co-Authors:	Brian Bellinger, Daniel Z. Skinner		
Presentation Type:	Poster	**College:** College of Education	**Major:** Elementary Education
Category:	Molecular, Cellular, and Chemical Biology		

ABSTRACT:

Winter wheat is planted in the fall and harvested the following summer, and therefore must survive the winter as frozen plants. There are many factors that contribute to the ability of plants to develop freezing tolerance. In order to develop plants that can better survive the winter, it is necessary to develop methods of evaluating their ability to tolerate subfreezing temperatures. In this study, we exposed wheat plants to a series of subfreezing temperatures, and then evaluated two measures of cellular damage as indications of freezing tolerance. Electrolyte leakage indicates how much the cellular membranes have been damaged; lipid peroxidation measures damage to the lipids in the membranes. More freezing tolerant plants can withstand lower temperatures for longer times with less electrolyte leakage and less lipid peroxidation. Among six wheat varieties tested, we found that the subzero temperature the plants were exposed to more significantly influenced survival than the amount of time at that temperature. The ability of the plants to survive and grow after freezing was related to the electrolyte leakage and lipid peroxidation measurements. There were differences found among the wheat varieties in their ability to tolerate time and temperature combinations. Using this information it will be possible to select plant lines with greater freezing tolerance for plant breeding efforts to improve winter hardiness.

Presentation Number 117

Abstract Title:	**The Wolf Princess: Analyzing Hayao Miyazaki's Princess Mononoke**		
Presenter:	Meredith Heinzmann		
Mentor:	Dr. Ryan M Hare		**Honors:** Yes
Co-Authors:	NA		
Presentation Type:	Poster	**College:** College of Education	**Major:** Music Education
Category:	Humanities		

ABSTRACT:

Japanese film director Hayao Miyazaki has created a number of striking animated films that have speeded the acceptance of Japanese animated film and television (*animé*) in the West. Animated works have traditionally been viewed as a medium exclusive to films/television intended for children, but *animé* is distinctly different, both in terms of the topics explored and the ways in which the stories are presented. Miyazaki's 1997 film, *Princess Mononoke* provides an excellent example of the complexity and depth that can be present in *animé*. The film is examined with four components in mind; this examination is intended to help viewers gain a deeper understanding of the film and unearth the complicated issues at the core of the narrative. The most notable of these issues are the changing role of women and the conflict between nature and technology, both in the context of the fourteenth through sixteenth centuries and today. These components (film composition, musical score, cultural influence, and story construction) inform the viewing of the film in distinct ways and illuminate subtleties that could be lost on the *animé* novice.

Presentation Number 118

Abstract Title:	**The Effect of Previous Herbivory and Virus on Aphid Fitness**		
Presenter:	Janelle Badger		
Mentor:	Dr. David Crowder		**Honors:** No
Co-Authors:	David Crowder, Paul Chisholm		
Presentation Type:	Poster	**College:** College of Agricultural, Human and Natural Resources	**Major:** Wildlife Ecology
Category:	Organismal, Population, Ecological, and Evolutionary Biology		

ABSTRACT:

Pea aphids (*Acyrthosiphon pisum*) are a phytophagous insect that are an important vector for the virus pea enation mosaic virus (PEMV), a virus responsible for the decline of productivity in the wheat/pea rotation in agricultural systems. The virus has been shown to increase the fitness of the pea aphid, but little has been done to show the relationship between previous herbivory and the virus on aphid fitness. 100 buckets each with a single pea plant were subjected to both lygus (*Lygus hesperus*) and pea weevils (*Bruchus pisorum*) in differing concentrations. We then eliminated those individuals and added 15-20 pea aphids onto each plant either infected with the PEMV virus or uninfected. We then measured their population growth every day for ten days. We found that buckets with individuals uninfected with the PEMV virus had a greater population change percentage on plants that hadn't be herbivorized, whereas the buckets with individuals infected with PEMV had greater population change percentage on plants that had been herbivorized.

Presentation Number 119

Abstract Title:	**Improving Aircraft Safety with an Airfoil Airspeed Sensor**		
Presenter:	David Finkel, Lindsey Elhart		
Mentor:	Howard Davis		**Honors:** Yes
Co-Authors:			
Presentation Type:	Poster	**College:** College of Engineering and Architecture, College of Business	**Major:** Chemical Engineering, Finance
Category:	Engineering and Physical Sciences		

ABSTRACT:

Aircraft use a myriad of sensors in order to safely and efficiently bring people and cargo to their destinations; and while air travel is one of the safest modes of transportation in the world, one of the leading causes of in flight complications is an incorrect airspeed indication by faulty equipment. Pitot tubes are the ubiquitous technology used to currently provide airspeed indications to pilots, but their design is inherently vulnerable to non-ideal weather and debris, resulting in the need of routine maintenance. The grounding of aircraft to have this additional maintenance, results in significant costs to airlines.

As part of an interdisciplinary senior design project, our group has been approached by The Boeing Company to develop an alternative means of providing this critical measurement. Our group has tackled this problem using a novel application of a well-established technology: airfoils. Our designed airfoil airspeed measurement system relies on the same principle that brings lift to an aircraft's wings. By measuring the pressure profile across the airfoil shape as the plane moves through the air, the aircraft's speed is determined, and unlike pitot tubes, this application is a closed-system, therefore, weather ailments will not compromise readings.

We have developed a proof of concept prototype and testing is currently underway by affixing the device to an automobile as a form of simulation. The goal of our testing process is to prove that our device provides results similar to pitot tubes while differentiating itself with increased reliability under adverse conditions.

Presentation Number 120

Abstract Title:	**A Look into Setaria and it's Water use Efficiency under Stress**		
Presenter:	Katelin Lape		
Mentor:	Patrick Ellsworth		**Honors:** No
Co-Authors:			
Presentation Type:	Poster	**College:** College of Arts and Sciences	**Major:** Botany
Category:	Applied Sciences		

ABSTRACT:

To meet the increasing demand for food and fuel, food and biofuel crops must be able to increase yields while increasingly being cultivated on marginal lands such as those that have low water availability. In other words, crops must increase yield produced per volume of water the plant transpires, which is called water use efficiency (WUE). To screen for high WUE, transpiration integrated over the life of the crop plant must be measured. The isotope ratio oxygen and carbon of bulk leaf tissue ($\Delta^{18}O_{leaf}$ and $\delta^{13}C_{leaf}$) may be used because they record differences in transpiration rate and stomatal conductance, respectively. In this project, 200 recombinant inbred lines (RILs) produced by crossing *Setaria viridis*, a model species of the C_4 photosynthetic pathway, with *S. italica* were planted in field plots under two treatment regimes: high and low density and high and low water availability. $\Delta^{18}O_{leaf}$ was significantly higher in low density treatment, while $\delta^{13}C_{leaf}$ was significantly lower in the same treatment. Contrary to what we expected, these results indicate that the low density plots had lower transpiration rates than the high density plots. This could be because other limitations such as root competition for soil resources reduced plant size in the high density plots, so that water availability was not limited and transpiration rate per leaf area could remain relatively high. In the water availability treatment, we found that transpiration rate was indeed lower in the low water availability treatment as we expected. The next step in our research is to identify RILs that had highest and lowest transpiration rates in all treatments relative to other parameters such as plant height, aboveground biomass, seed yield, and plant chemical composition (ionomics). These RILs will be used in future studies as comparisons to determine the mechanisms that increase WUE under stress.

Presentation Number 121

Abstract Title:	**How Biofilm Inhibitors affect Biofilm Structure**		
Presenter:	Mia Mae Kiamco		
Mentor:	Haluk Beyenal		**Honors:** No
Co-Authors:	Mohiuddin Md. Taimur Khan, Haluk Beyenal, Nehal Abu-Lail, Douglas Call		
Presentation Type:	Poster	**College:** College of Engineering and Architecture	**Major:** Chemical Engineering
Category:	Molecular, Cellular, and Chemical Biology		

ABSTRACT:

Biofilms are thin layers of microorganisms growing on surfaces and biofilm-related wound infections are a significant medical challenge. *Staphylococcus aureus* is a particularly challenging biofilm-producing agent that can cause wound infections, pneumonia and septic shock. Public concern towards this bacterium has arisen due to its resistance to many antibiotics, especially when found in a biofilm community. The goal of this work was to test the hypothesis that osmotic agents change biofilm structure thereby allowing more antibiotic penetration into *S. aureus* biofilms. If supported, this work suggests new directions in combinatorial therapies to address wound biofilms. A green fluorescent protein (*gfp*) expressing strain of *S. aureus* was used in this study. An overnight culture of *S. aureus* was prepared in presence of chloramphenicol. A Stovall flow cell was inoculated with overnight *S. aureus* culture and was kept static period for 4 hours followed by a flow (24 mL/h) of 10% tryptic soy broth supplemented with chloramphenicol. A Nikon C2, confocal laser scanning microscopy (CLSM) was used to image *S. aureus* biofilms after approximately 40 hours of development. Three time-lapsed images were obtained: initial biofilm, biofilm treated with osmotic agent, and biofilm treated with antibiotic. The CSLM images were used to quantify biofilm structure numerically. We used previously developed image analysis software by our research group, ISA, to analyze biofilm images. Biofilm thickness was reduced from 42μm to 9μm after the osmotic agent treatment and was reduced further to 0.7μm when it was treated with antibiotic. In a parallel study, we did not see any significant change of biofilm thickness due to the exposure of antibiotic alone. Exposure to antibiotics affected cell viability, judged indirectly by reduced fluorescent signal intensity from the GFP marker. Porosity of biofilm increased from 66% to 99% indicating that cells disaggregated and became inactive. Exposure to osmotic agent led to reduced biofilm thickness and improved porosity. The addition of antibiotic caused further reduction of biofilm thickness and both osmotic agent and antibiotic exposure increased biofilm porosity. These results are consistent with the hypothesis that exposure to hyperosmotic agents alters biofilm structure and enhances effectiveness of antibiotic treatment.

Presentation Number 122

Abstract Title:	**Optimization of Bioconversion of Lignin with Oleaginous Rhodococus DSM1069 and PD630**		
Presenter:	Francisco Soto		
Mentor:	Dr. Bin Yang		**Honors:** No
Co-Authors:			
Presentation Type:	Poster	**College:** College of Arts and Sciences	**Major:** General Biological Sciences
Category:	Engineering and Physical Sciences		

ABSTRACT:

Lignin is the most abundant aromatic carbon source found on earth that composes 20-35% (dry weight) of plant lignocellulose. Lignin comprises phenylpropanoid aryl-C3 units that form the polymer. A variety of ether and carbon-carbon bonds link phenylpropanoid aryl-C3 units tightly making the lignin polymer resistant to microbial degradation. White-rot and brown-rot fungi degrade lignin using extracellular mechanism. The literature has characterized fungal mechanisms extensively, but has over looked the potential for bacterial degradation of lignin. Bacteria offer advantages over fungi for biotechnological applications, such as efficient large-scale growth, more convenient molecular genetics

Rhodococcus is a genus of aerobic, nosporulating, nonmotile, Gram –positive bacteria that is closely related to Mycobacteri and Corynebacteria. *Rhodococcus* can catabolize a wide range of compounds and produce bioactive steroids, acrylamide, and acrylic acid. *Rhodococcus* grow at high rates and develop in a simple cycle. The scientific community, however, has failed to characterize *Rhodococcus* as a potential organism for lignin degradation.

Presentation Number 123

Abstract Title:	**Fashion as Identity: How Clothing Reflects Life Events**		
Presenter:	Gordon Stumpo		
Mentor:	Patricia Fischer		**Honors:** Yes
Co-Authors:			
Presentation Type:	Poster	**College:** College of Agricultural, Human, and Natural Resources	**Major:** Apparel Design
Category:	Arts and Design		

ABSTRACT:

The wardrobes of highly documented public figures provide a wealth of knowledge surrounding their role as a member of a social class, the clothing style of the time in which they lived, and how their personal lives are represented through their clothing styles. As one of the most highly photographed women in history, a large volume of photographs of Princess Diana currently exists, allowing for numerous types of visual analysis of these images. Princess Diana serves as an important figure in fashion history and a perfect case study in social change pertaining to the self and appearance.

A visual analysis of the wardrobe of Lady Diana Spencer, Princess of Wales was conducted, focusing on her time in the public eye from 1981 to 1997 in order to determine the changes in her clothing over time. The personal and social context of these clothing changes is further explored, resulting in identification of five distinct life segments of Princess Diana, each of which has a specific clothing style associated with it.

Through this process, a connection between clothing style in each life segment and events that occurred during the respective life segment were discovered. Early on, Princess Diana did not have many clothing options since those around her heavily influenced her in the palace. As she grew as a woman and a royal, her clothing changed with her, exploring bolder colors and fabrics. After divorce from husband Prince Charles, a dramatic change occurred when Princess Diana was able to wear shorter dresses, expose her arms, and wear high heels, things she was unable to do while under direct royal influence over her appearance.

The same rings true for other prominent social figures, such as celebrities, politicians, musicians, artists, and other persons of interest. These diverse groups share a common thread of nonverbal communication through their clothing choices.

Presentation Number 124

Abstract Title:	**Design and Testing of an Orientation - Independent Superconducting Fuel Level Gauge**		
Presenter:	Elijah Shoemake		
Mentor:	Dr. Jacob Leachman		**Honors:** Yes
Co-Authors:			
Presentation Type:	Poster	**College:** College of Engineering and Architecture	**Major:** Mechanical Engineering
Category:	Engineering and Physical Sciences		

ABSTRACT:

The Genii Unmanned Aerial System (UAS) has the ambitious goal to be the first liquid hydrogen fueled UAS developed by a university team. Genii is hindered by an inability to measure the quantity of liquid hydrogen in the fuel tank. While there are current designs for hydrogen level gauges based off of optical and capacitance measurements, these sensors are prone to error from small changes in dielectric constant. A new form of level gauge, using MgB_2 superconducting wire, is being developed to improve hydrogen level sensing technology. This technology has been proven in applications utilizing a single vertical strand of MgB_2 in static liquid hydrogen storage dewars, however no extension to dynamic storage dewars where orientation or slosh is significant has been made. To solve this problem, we are designing a fuel level gauge that consists of multiple lengths of MgB_2 wire to accurately measure hydrogen level in any orientation. Initial design calculations for this type of sensor have already been performed. The goal of the current research is to validate these design calculations by running a series of tests on the transient response of superconducting wire and comparing this response to the expected response from the design calculations. First, we test the wire by moving it in and out of a tank partially filled with a cryogen, and then we will move on to integrate it in a cryogen tank and observe the results as the cryogen is removed from the tank.

Presentation Number 125

Abstract Title:	**Identification of Immature and Adult Stages of Leafhoppers in Vineyards with DNA Barcodes**		
Presenter:	Ashley Johnson		
Mentor:	Dr. Doug Walsh and Dr. Laura Lavine		**Honors:** No
Co-Authors:			
Presentation Type:	Poster	**College:** College of Education	**Major:** Viticulture and Enology
Category:	Organismal, Population, Ecological, and Evolutionary Biology		

ABSTRACT:

Leafhoppers are an important species of interest to viticulturists and the wine grape industry not only because they cause economic damage to plants but because they have the potential to vector grape diseases. An important tenet of any Integrated Pest Management (IPM) program is monitoring and identification of pest species. Leafhoppers common to vineyards in Washington state are difficult, but not impossible, to identify as adults. However, these same species of immature leafhoppers have no distinguishing characteristics for separation of species thus making monitoring programs particularly problematic. This study was conducted to identify DNA barcodes from the most commonly collected leafhoppers in vineyards in Washington State in order to develop a rapid and economical method to monitor leafhopper species populations and densities within a growing season. Results to date include insect collection and morphological identification of adults, identification of the insect barcode (mtCOI-5P region) from our leafhopper species, and sequencing of this region from leafhopper adults and immatures. Future work will include a genetic analysis and the construction of robust and statistically supported phylogenetic trees and phenetic clustering diagrams using software programming.

Presentation Number 126

Abstract Title:	**Hyperbaric Oxygen (HBO2) Treatment Suppresses the Withdrawal Symptoms in Opioid Dependent Mice**		
Presenter:	Daniel Nicoara		
Mentor:	Dr. Raymond Quock		**Honors:** No
Co-Authors:	Yangmiao Zhang, Jordan T. Nelson, Abigail L. Brewer, Donald Y. Shirachi and Raymond M. Quock		
Presentation Type:	Poster	**College:** College of Veterinary Medicine	**Major:** Biochemistry
Category:	Molecular, Cellular, and Chemical Biology		

ABSTRACT:

Hyperbaric oxygen (HBO_2) therapy has been approved by the Food and Drug Administration (FDA) for 14 clinical conditions (Gesell, 2008). There have been indications that HBO_2 treatment might be able to reduce opioid withdrawal symptoms in human subjects (Epifanova *et al.*, 1988; Epifanova, 1995). However, no following study has been found to further investigate the effect of HBO_2 on opioid withdrawal symptoms. The purpose of this research was to determine whether HBO_2 treatment could suppress the withdrawal symptoms in mice dependent on opioid. Male NIH Swiss mice received repeated subcutaneous injections of morphine sulfate or saline twice a day for 4 days. The daily dose of morphine sulfate was increased progressively from 50 mg/kg on day 1 to 125 mg/kg on day 4. On day 5, opioid withdrawal symptoms were precipitated in morphine-treated mice by intraperitoneal injection of 5 mg/kg naloxone. Withdrawal symptoms in mice, including jumping, fore paw tremor and wet dog shake, were recorded for 30 min and scored. Sixty min prior to the naloxone injection, subgroups of mice received a 30-min or 60-min HBO_2 treatment. The results demonstrated that HBO_2 treatment was able to reduce the jumping, fore paw tremor, wet dog shake and some other withdrawal symptoms in opioid dependent mice. It was also indicated that 60-min HBO_2 treatment was more effective at suppressing withdrawal symptoms than 30-min HBO_2 treatment.
(This research was supported by NIH Grant AT-007222 and the Allen I. White Distinguished Professorship.)

Presentation Number 127

Abstract Title:	**Mobile Foam**		
Presenter:	Chris Routen, Bettina Ernst, Dane Baird, Austin Carter		
Mentor:	Howard Davis		**Honors:** No
Co-Authors:	Bettina Ernst, Dane Baird, Austin Carter, Chris Routen		
Presentation Type:	Poster	**College:** College of Engineering and Architecture, College of Business	**Major:** Mechanical Engineering, Marketing
Category:	Engineering and Physical Sciences		

ABSTRACT:

Mobile Foam is a startup company that strives to solve the global deficiency of affordable housing. Over 1.6 billion people live in substandard housing, and over 100 million people are homeless. The majority of these people live in developing countries, where homeless shelters and other forms of help are even fewer than in the United States.

A construction technique called Insulated Concrete Forms (ICF) is changing the international construction market. ICF construction uses foam blocks for the structural integrity of walls instead of traditional materials such as wood panels and cinder blocks. The building method for ICF is to lay a cement foundation with rebar protruding from the ground, and then stack modular foam blocks of uniform size next to, and on top of one another, much like Legos, to construct foam walls. Concrete is then mixed and poured into holes in the foam blocks to secure them in place.

Homes built using ICF are cost-effective and completely earthquake proof. They are also easy to build; a group of untrained volunteers can build a house in less than a week. Several non-profits are currently building homes in developing countries using ICF technology and are experiencing a large inefficiency with the process. Right now, there is no way to produce the foam blocks on site, or even in the countries that they are building in. The foam blocks are being built in the United States and then shipped to the site of construction. This is a huge inefficiency, more than a third of a cost of each home is due to shipping costs. The large shipping costs have been the limiting factor in how many homes these companies have been able to build.

Mobile Foam is a company that strives to make the manufacturing process of polyurethane foam blocks more efficient. Mobile Foam is a turn-key solution for organizations seeking to do construction internationally, by designing molds that allow for production of foam blocks on-site.

Presentation Number 128

Abstract Title:	**The Effect of External Radiation on DNA-Enzyme Complexes**		
Presenter:	Joseph Traverso		
Mentor:	Dr. Nikolaos Voulgarakis		**Honors:** No
Co-Authors:	Dr. Nikolaos Voulgarakis		
Presentation Type:	Poster	**College:** College of Engineering and Architecture	**Major:** Mechanical Engineering
Category:	Computer Science, Mathematics, Statistics, and Information Sciences		

ABSTRACT:

In two of the most fundamental processes of life, transcription and replication, appropriate proteins have to successfully translocate along the DNA molecule. In this project we used a simple mathematical model to study how external radiation and proteins aggregation affect the mechanical and dynamical properties of DNA. The dynamics of DNA base pairs are described by the Peyrard-Bishop-Dauxois model, and a simple Gaussian potential profile is used to model DNA-proteins interaction. The entire project was conducted using molecular dynamics simulations on the WSU high performance Linux cluster. Results show that the dynamics of the protein-DNA complex was not affected by external terahertz radiation. However, our simulations indicate that protein-protein interactions significantly modify the elasticity of the DNA molecule by locally melting the double strand. This result provides an understanding of the mechanism used by the mitochondrial transcription factor A (TFAM) to compact DNA.

Presentation Number 129

Abstract Title:	**Interaction Of β-Mercaptoacetate (MA) and G-Protein Coupled Fatty Acid Receptors For Control Of Appetite By Dietary Fatty Acids**		
Presenter:	Katie Van Cleave		
Mentor:	Sue Ritter		**Honors:** No
Co-Authors:	Thu Dinh, Sue Ritter		
Presentation Type:	Poster	**College:** College of Arts and Sciences	**Major:** Biology
Category:	Molecular, Cellular, and Chemical Biology		

ABSTRACT:

The broad goal of this project is to determine how and where the essential metabolic fuels – glucose and fatty acids – are monitored and how fluctuations in the availability of these fuels alter food intake. The specific goal is to examine the relationship between the compound β-mercaptoacetate (MA) and the G-protein coupled receptor 40 (GPR40), a newly discovered membrane fatty acid receptor that controls release of gastrointestinal hormones that control appetite. Mercaptoacetate produces potent increases in appetite, but its mechanism of action is unknown. Our lab has produced strong *in vitro* evidence that MA antagonizes the effect of fatty acids at GPR40 receptors. In the present project, I am testing the effect of MA *in vivo* on secretion of a gastrointestinal hormone called ghrelin that stimulates feeding and is known to be released by fatty acid-induced inhibition of GPR40 receptors. Under normal conditions, ghrelin is secreted during food deprivation and increases appetite. When food is present, secretion of ghrelin is inhibited by GPR40 receptors, reducing the drive to eat. My hypothesis is that MA will attenuate the fall in ghrelin secretion induced by ingestion of fat, thereby enhancing hunger and reducing the normal satiating effect of fat. To test this hypothesis, rats are implanted with catheters for blood sampling. After recovery, they are food deprived overnight. The next morning, blood is sampled in separate groups under 3 conditions (1) before and after injection of MA without food; (2) before and after MA in combination with a fatty meal; and (3) before and after a control injection in the absence of food. Intake of food, if present, is measured. Blood levels of ghrelin will be measured by ELISA assay. Next, I will study the effect of these treatments on transgenic mice that do not express the gene for the GPR40 receptor to verify the dependence of MA's effect on this receptor. If our hypothesis is supported, results will represent a big step forward in delineating a pathway through which fatty diet alters feeding behavior and may suggest MA as a drug prototype for control of obesity and management of diabetes.

Presentation Number 130

Abstract Title:	**The Impact of Social Media on 4-H in Washington State**		
Presenter:	Melissa Brown		
Mentor:	Drew Betz		**Honors:** No
Co-Authors:			
Presentation Type:	Poster	**College:** College of Agricultural, Human, and Natural Resources	**Major:** Human Development
Category:	Social Sciences		

ABSTRACT:

Traditionally, 4-H leaders and county staff have used email, phone calls, and personal communication styles to encourage community members and current 4-H families to participate or reflect upon events happening within the 4-H program. However, with today's youth and families using more social media sites, 4-H has the potential to make communication with the community more broad and effective. Making 4-H accessible to a diverse population of families can help target recruitment to families interested in non-traditional projects in addition to the traditional projects 4-H offers. For more urban communities it can help break down the stigma of 4-H just being "cows and cooking" and can help families in these communities understand that they can be involved in 4-H; even if they are not interested in one of the traditional livestock projects.

In the research we have looked at how current 4-H staff, leaders, and teens in Washington State use different social media sites, and what barriers they have encountered in getting started or reaching families through this platform. Social media could be an outlet used to increase recruitment as well as retention rates in the 4-H program throughout Washington State. Social media sites that were specifically targeted in this research include Facebook, Twitter, and Pinterest. Based on the results of the research each social media site helped in a different area of recruitment or retention and together they impacted the success of 4-H events in a positive way. Learning from other peoples experiences using these social media sites and having the ability to target specific social media outlets that have been the most successful thus far is crucial to continued expansion in this space. Using this research we can see what parts of social media are currently being used and ways to break down the barriers to encourage further connections to continue to develop the 4-H program in communities across Washington.

Presentation Number 131

Abstract Title:	**Variable Pitch Propeller for Small Scale Unnamed Arial Vehicles.**		
Presenter:	Nicholaus Perry		
Mentor:	Dr. Jacob Leachman		**Honors:** No
Co-Authors:			
Presentation Type:	Poster	**College:** College of Engineering and Architecture	**Major:** Mechanical Engineering
Category:	Engineering and Physical Sciences		

ABSTRACT:

Small Scale Unmanned Areal Vehicles are becoming prevalent and will only grow more numerous as the FAA legalizes their use. The options for propelling UAVs in this size are mostly constrained to motors and propellers intended for hobby purposes. This has left a gap in the market for items needed for serious applications that are not viable in the many of the new smaller UAVs are built in. The Variable Pitch Propeller system I have designed and prototyped fills such a gap.

The GENII UAV designed by a student group at WSU falls into this category. Because of its size GENII is limited to using an electric motor and a propeller designed for Hobby airplanes. But because of the power to weight ratio of the hydrogen fuel cell GENII will eventually use for power matching a commercially available motor and fixed pitch propeller is less than ideal. This is because GENII cannot vary its revolutions per minute from takeoff to cruising, thus the power drawn by the motor is not always equal to the maximum power available. The electrical system of GENII is designed to run the motor at a speed of 5000 rpms and running it any slower could cause damage and failure to the electrical system. The variable Pitch Propeller system that I have designed allows for the pitch of the propeller to be changed to allow the motor to pull the maximum power available from takeoff to cruising. This results in a faster rate of climb, a higher cursing and top speed and an increase in the maximum payload of the aircraft. The biggest benefit to GENII is the increased payload. The hydrogen fuel cell in heavy for the power it produces and without the VPP GENII could not carry a payload beyond the essentials it needs to fly. To our knowledge the VPP system I have designed is the only active VPP system in this scale, all others being for airplanes piloted by humans or for the smaller RC controlled airplanes.

Presentation Number 132

Abstract Title:	**Pop Up Gallery: Jobs That Don't Exist Yet: Testing the use of Augmented Reality as a means of Education in a K-12 Environment.**		
Presenter:	Brittany Wouden, Angela Morelli, Stephen Palermini, Mychael Jones		
Mentor:	John Barber		**Honors:** No
Co-Authors:	Stephen Palermini, Angela Morelli, Mychael Jones, Amalia Vacca, Francis Dunn		
Presentation Type:	Poster	**College:** College of Arts and Sciences	**Major:** Digital Technology and Culture
Category:	Arts and Design		

ABSTRACT:

The Pop Up Gallery: Jobs That Don't Exist Yet is a mobile gallery presented through augmented reality technology. The theme of the project, generated from participation in the National Collegiate Innovators and Inventors Association Innovation Fellowship, emphasizes the need for entrepreneurship and innovation among students and stresses the importance of a college education through a kinesthetic and engaging activity. It asks the question, is augmented reality an effective means of education for students, particularly in a K-12 environment? The Pop Up Gallery Team developed a gallery show focused on entrepreneurship and innovation in order to understand and answer this question.

The gallery pieces were then augmented with Aurasma, a free augmented reality application available to the public, and through a combination of the Unity game creation platform and Vuforia, an augmented reality platform capable of handling more detailed 3D models. Augmented reality allows for the gallery show to be both cost-effective and mobile and allows for more students to participate. In a partnership between University of California, Davis College Options and the Pop Up Gallery Team, the presentation was taken to multiple schools in Shasta County, California, for first generation, low-income K-12 students to experience. Over a four day period more than 800 students and faculty participated in the gallery, learning about future jobs, entrepreneurship, innovation and the college paths available. Students displayed understanding of material and interest in the subject through the kinesthetic nature of augmented reality.

Our findings show that augmented reality proves to be an effective method of education as the students and schools began implementing augmented reality into school curriculum. The schools have begun supplementing traditional topics of education with augmented reality. The spirit of innovation has also been accepted by the community with participating students using the augmented reality in conjunction with the community art council. Success with the Pop Up Gallery has allowed for ongoing research and development of future augmented reality presentations covering a variety of topics and created for multiple age groups and has resulted in our invitation to return to Shasta County for National Kindergarten Day to demonstrate augmented reality to over 1500 children.

Presentation Number 133

Abstract Title:	**Design and Proto-Typing for this Generation**		
Presenter:	Brianna Martensen		
Mentor:	Kathleen Ryan		**Honors:** No
Co-Authors:	Diane Wilford		
Presentation Type:	Poster	**College:** College of Agricultural, Human, and Natural Resources	**Major:** Interior Design
Category:	Arts and Design		

ABSTRACT:

The practice of design in informal learning environments is best received by users when multiple disciplines work together. The intent of this project was to improve user interaction within a space through the use of cross-disciplinary collaboration and engagement through workshops involving undergraduate students in interior design, and graduate students in geology and physics. The workshops addressed the redesign of an existing geology, environmental sciences and physics exhibits in an academic setting on a university campus. The redesign was driven by an observed lack of visitor interaction although the exhibits are in a well-traveled area. Informal learning allows people to interact and learn in an independent environment.

Participating student teams developed different strategies for interpretation based on understanding that "telling a story" is an engaging format that promotes visitor interaction. Each group individually collected data of the space by observing daily traffic patterns, number of students interacting with the exhibits, tracking the time that people spent in the space, and reviewing physical aspects of the space such as electric and daylighting. The science disciplines contributed the context for the 'story' that the disciplines would like to portray and provided critical reference points for the future exhibit designs. From all of the research and information gathered, each design team worked together to create a redesign for the geology and physics exhibit space.

The importance of this redesign is to improve the user interaction within this informal learning space but also be able to provide the user with useful information as to what is going on within the walls of the building, and be engaged in the science content.

The design students produced proto-type interpretive graphics and hands-on exhibits, and installed them in the space. These proto-type exhibits will allow for observation of user interaction after the change. This phase of the project is essential to evaluate how effective the new interpretive exhibits are, in order to proceed to the next phase of the exhibit/entry hall. The implementations of new designs that respond to informal learning strategies allow individuals to view through the lens of an expert in another discipline.

Presentation Number 134

Abstract Title:	**Cultivating a Grass Garden through Texture, Color, and Form**		
Presenter:	Lucas Vannice		
Mentor:	Dr. Rick Knowles, Caroline Pearson-Mims		**Honors:** No
Co-Authors:			
Presentation Type:	Poster	**College:** College of Engineering and Architecture	**Major:** Landscape Architecture
Category:	Arts and Design		

ABSTRACT:

In summer 2013, I participated in an internship to design, develop, and implement a Grass Garden within the existing Horticulture and Landscape Architecture Display Garden on the WSU Pullman campus. I was challenged with following the Garden's original conceptual plan and with developing a plan for future expansion of the Garden.

Plans for the Display Garden began in 2007, when old teaching greenhouses were demolished and replaced by new facilities elsewhere on campus. In 2008, Landscape Architecture students began designing and installing the first structures and plantings. Since then, the Display Garden has continued to expand, with students developing and implementing their concepts, which emphasize sustainability of place and resources.

Design began with a site inventory and analysis to document pedestrian circulation, environmental factors, and existing plantings. I worked closely with my mentors to research appropriate plants and explore potential designs, many by Piet Oudolf. Plant texture, color, form, and growth requirements also were considered. It was essential that the plants be aesthetically appealing in all seasons.

Installation was completed in August. The result is an eye-catching design developed from a limited plant palette with contrasting textures and colors, which add to the dynamic appearance of the space throughout the year. Small shade trees vertically define the space and provide cooling, spring flowers, and brilliant fall color.

Reaction to the Grass Garden has been overwhelmingly positive. During construction, people stopped by to inquire about the activity and show their support. On nice days, people can be seen enjoying the space. The unattractive concrete foundations have been transformed into an inviting space overflowing with plants where people can enjoy some afternoon shade.

My future vision for the Grass Garden is to develop the adjacent area into a space for gathering, while keeping in mind a larger ecological framework. By focusing on the two distinct on-site microclimates, a diverse palette of native plants could be utilized. Limiting the design to native plants ensures minimal maintenance, water use, and increased habitat for local fauna. With additional funding and support, a future intern could have the opportunity to implement this plan.

Presentation Number 135

Abstract Title:	**Design Perspectives of Shared vs. Displayed Culture**		
Presenter:	Ky Christiansen		
Mentor:	primary - Kathleen Ryan; secondary - Phil Gruen		**Honors:** No
Co-Authors:			
Presentation Type:	Poster	**College:** College of Agricultural, Human, and Natural Resources	**Major:** Interior Design
Category:	Arts and Design		

ABSTRACT:

Throughout the colonization and occupation of North America, artifacts from Native American and First Nations people, have been collected and displayed in academic museums for non-Indigenous people to see and explore. The fervor to collect and display artifacts inevitably disjointed Native American cultural identity and didn't correctly communicate the Native Americans perspective. Western perspective interpretations have perpetuated a rift in cultural awareness and understanding.

We must understand the intent behind why one collects artifacts outside of one's cultural identity and design spaces to facilitate their display. Interpretation strategies must incorporate Native peoples' perspective on how artifacts are to be 'shared' rather than 'displayed'. A designed space must be representative of the intended nature of culture rather than an outsider's interpretation of culture. This semantic differential between shared vs displayed is key to developing new strategies for exhibit design.

This project began with the development of case studies of successful relationships between curators and tribal nations. These examples yielded culturally adaptive museums and exhibits that portray Native peoples as living, dynamic groups of people rather than a culture from the past. Case studies also identified traditionally western influenced museum design as a comparative study to navigate the pitfalls of cultural misrepresentation. Through participatory co-design workshops and prototyping with key stakeholders of the Native American community collaborative meanings of design and artifact are developed together. The process is hoped to be transferrable to other situations of interpreting past culture considering the Native perspective.

This exploration through participatory design begins to identify the meaning of design elements and materials to Native Americans, First Nations, and general Americans in order to create designed spaces that speak to all groups. Recognizing the meaning of design components such as relevant natural resources and materials and their spiritual and social context to the varying cultures creates a design language that can bridge the gap of cultural misunderstandings and start the healing process through the creation of an intermediary space. The resulting design project is intended to demonstrate the importance of transferrable collaborative models of co-designed informal learning environments, such as academic museums, and responsible cultural interpretation.

Abstract Title:	**Sea Clearly Diving Mask**		
Presenter:	Kevin Wandro		
Mentor:	Dr. Howard Davis		**Honors:** No
Co-Authors:	Victor Small, Jacob Inderbitzin, Brandon DeChiara		
Presentation Type:	Poster	**College:** College of Engineering and Architecture	**Major:** Bioengineering
Category:	Engineering and Physical Sciences		

ABSTRACT:

There are 1.5 million scuba divers and snorkelers in the United States. They participate in the sport of diving to view beautiful underwater scenery. One of the most common problems divers face is mask fogging due to condensation. This invalidates the entire objective of the diving experience. In addition to this inconvenience, it can be dangerous. This is where Sea Clearly™ comes in.

By developing a mask that doesn't fog, we can give the diver the chance to experience the ocean and all that it has to offer. A Sea Clearly™ diving mask utilizes passive technology, meaning no parts to break or wear out ensuring a long-lasting reliable fog-free diving experience.

Mask fogging in measurable terms is represented by 100% relative humidity on the inside of the lens. The ideal situation would be to de-humidify the mask and keep the relative humidity low enough that it would not condense. Sea Clearly™ is working under the hypothesis that the condensation can be targeted to points in the mask that are outside of the diver's field of view.

In order to develop the Sea Clearly™ mask, virtual modeling was used to validate design assumptions. From these assumptions, a physical testing protocol was created using a mask analog for proof of concept and to fine-tune design development by establishing design specifications for a full prototype. The prototype will be tested to ensure compliance with performance specifications.

Presentation Number 137

Abstract Title:	**Consolidation of the Unrecognized | From Abyss to Radiance**		
Presenter:	Keli Haffner		
Mentor:	Kathleen Ryan		**Honors:** No
Co-Authors:			
Presentation Type:	Poster	**College:** College of Agricultural, Human, and Natural Resources	**Major:** Interior Design
Category:	Arts and Design		

ABSTRACT:

"Instead of cursing the darkness, light a candle," -Benjamin Franklin. It is captivating that an individual form of light can define the darkness of a space but it can also challenge the space in becoming functionally exceptional.

Interior design students began a project in a former-atrium space. Students participated in a workshop pertaining to different forms of light and optics in a new way of learning by actually working with light through light exhibits, and physically grasping ways light can move. This format made for greater understanding through expression in contrast with a traditional classroom format. The experiential learning impacted and advanced student understanding of light and the ability to apply that understanding to a design problem.

Students visited the de-composing, empty site to interview building occupants and investigate the site. Developing case studies on the workplace assisted students in understanding how light can have a major impact on workplace design.

Students presented preliminary design ideas to the building occupants to gather further information in determining what could be done to eradicate the black abyss. The proposed design for the atrium space utilizes color mixing, the clustering together of LED lights with the three primary colors to blend and produce variations of color, mainly being the production of a soft white light. In addition, the design makes use of light reflection through the laws of reflection, that is the angle at which a wave of light projecting onto a surface is equal to the angle that is reflected back. Light is an essential tool in recognizing the world and being able to communicate within it.

The end result features a series of lighting units that reflect to a specific location depending on the function. Both formal and informal spaces are designed to generate a variety of environments for occupants to work in and feel as if they are being inspired by something new. The incorporation of a reflective ceiling makes for the borrowing of light to influence the space in inventive ways. Eradicating the darkness in this black abyss is indispensable in generating radiance for the building occupants.

Presentation Number 138

Abstract Title:	**Historic Walking Tour in Colfax, Washington: A Link to Eastern Washington's Past**		
Presenter:	Kendra Bone		
Mentor:	Kathleen Ryan, Bob Krikac		**Honors:** No
Co-Authors:			
Presentation Type:	Poster	**College:** College of Agricultural, Human, and Natural Resources	**Major:** Interior Design
Category:	Arts and Design		

ABSTRACT:

As an undergraduate in the Interior Design program I have been given the opportunity to engage in rural community development through design, as it has become a prominent and important part of our curriculum. We have been introduced to the idea of civic-engagement and the important role we as designers play in rural community development – this serves as the inspiration behind my interest in The Colfax WA Historic Walking Tour.

Qualitative methodology included site analysis utilizing resources found in the Whitman County Archives –newspapers, photographs, and other documents. I have been able to implement my communication skills developed through previous rural community work. Investigation within the community through consideration of artifacts and events of cultural and historical importance are being transformed through this new and exciting form of rural community service and development. I have, and will continue to meet with prominent community members affiliated with the development of Palouse towns and communities, to discuss Colfax's history both culturally and architecturally. Their knowledge and input will greatly weigh the site and landmark choices – eventually developing into a printed walking tour guide and the design of a web-based guide.

The implementation of a Historic Walking Tour in the town of Colfax will encourage those who usually only pass by to engage themselves in the town through its cultural and architectural history. This will not only ignite interest among visitors, but also provide the town of Colfax with recognition for their work in keeping the culture and history of the town relevant in the present day. The town will also potentially benefit economically due to an increased number of tourists, as well as have an emotional impact on the community – where they feel an increased connection to the history of their town. I am excited to engage in a project that will challenge me as a researcher and learner in my field of study, while also allowing me hands on participation in the service and development of a rural community. Colfax has the opportunity to highlight landmarks in their community, and link to eastern Washington's past.

Presentation Number 139

Abstract Title:	**The Science of Sustainability: Developing Hands-On Exhibits on Heat Transfer**		
Presenter:	Uris Giron		
Mentor:	Kathleen Ryan		**Honors:** No
Co-Authors:	None		
Presentation Type:	Poster	**College:** College of Agricultural, Human, and Natural Resources	**Major:** Interior Design
Category:	Arts and Design		

ABSTRACT:

To the outsider life in our rural communities is a pastoral ideal and resistant to social, cultural, or economic distress, however, the reality is that rural families and communities currently face more severe hardships than their urban counterparts.
Rural dwellings are particularly at risk for less durable building materials and construction methods. In particular dwellings are not built to perform in their region's climate. There are many challenges in building affordable and efficient homes, and an approach that considers focusing on a population that is eager to learn provides insight into promoting change in building practices.

Project S.O.S The Science of Sustainability has developed and tested hands-on exhibit prototypes demonstrating the concepts of **Conduction**, **Convection**, and **Radiation.** S.O.S. exhibits focus on how these three basic concepts of heat movement affect the heating and cooling of homes. These three basic concepts of physics are essential in understanding the mechanisms of heat loss and heat gain. Rural youth between the ages of 11 and 13 are the focus audience. Youth participated in collaborative exercises that develop both understanding of the concepts of heat transfer with understanding how to actively support each other's learning.

This project assesses how youth learn from engaging with hands-on exhibits, and how they translate that learning with a set of tools to their own homes.

Presentation Number 140

Abstract Title:	**White Spring Ranch**		
Presenter:	Uris Giron		
Mentor:	Kathleen Ryan		**Honors:** No
Co-Authors:	None		
Presentation Type:	Poster	**College:** College of Agricultural, Human, and Natural Resources	**Major:** Interior Design
Category:	Arts and Design		

ABSTRACT:

Every place we travel to, has its own rich history, if learned, this history can give us a chance to further our understanding of people, places, and cultures in a much deeper level. How can we better expose historical knowledge to the public? One way is through designing archival museums next to historical sites.

In the outskirts of Moscow, Idaho a group of design students worked together with the owners of White Spring Ranch to design an archival museum next to the site of the current house museum, and natural history exhibit. The museum is meant to compliment and share the historical values of the site and region.

Our design team of interior designers and landscape architecture students worked together to design a building that will house archival materials in a safe, climate-controlled environment. Our team visited the historical site of White Spring Ranch to learn of the rich history and traveled to a regional archival museum to understand how to design spaces that will make historical materials last lifetimes. It was important for our team to understand the history of the site and how to protect it.

White Spring Ranch houses hundreds of magazines, newspaper, and daily living objects like kitchen tools, clothing, furniture and other objects. These items currently overwhelm all of the rooms within the house museum, making it hard to walk around and truly experience the evidence of early life on the Palouse. This problem of having too many historical materials can be found in many rural museums. To help resolve this problem our team designed a building that includes a reception area, map room, office, archival storage, exhibit displays for fabrics, chairs and a large climate control system.

The archival museum can successfully house all of the excess materials in the White Spring Ranch house museum, and allow them to create vignettes of historical life. This solution can be done on similar historical sites, further enhancing the experience of visitors interested in understanding the history of rural life.

Presentation Number 141

Abstract Title:	**A Library for the Future**		
Presenter:	Anne Borges		
Mentor:	Kathleen Ryan		**Honors:** No
Co-Authors:			
Presentation Type:	Poster	**College:** College of Agricultural, Human, and Natural Resources	**Major:** Interior Design
Category:	Arts and Design		

ABSTRACT:

Goal: The role of the public library in a rural community is changing to accommodate for the shift towards a more digital based society. This project investigated the role of a library in a small town, the perception of the community and how design of the built environment could accommodate new roles and community ideas.

Background: The role of the new library is to supply resources in a variety of forms to members of the community that they may not be able to get elsewhere. This is especially important in rural areas where resources are limited. There are opportunities for exploring new technologies, learning new life skills such as cooking and gardening, and the capability to accommodate for all other creative and educational outlets. In the fall of 2013 students in interior design, landscape architecture, architecture and construction management began working on a project with a rural community in the Pacific Northwest (population 2,600) to facilitate and collaborate on the preliminary phases of designing a new library to better fit their needs and to grow with them into the future.

Methods: The students facilitated a participatory design workshop with the community to uncover the new understanding of a library for their rural town. Students were able to interact with community members. This interaction made it easier to acquire an understanding of the community needs. Interviews were also conducted with community members to determine what features they would like to see in the new building. Students observed and documented the downtown and surrounding areas.

Further research was done to support the findings from the community visit. Case studies were developed on how other libraries around the world are evolving in other communities, and demonstrated that libraries are accommodating for growing technology as well as becoming centers for community activity. In this rural community it means a space that can accommodate their current needs, as well as their needs as they change into the future. It should be the center for community activity, as well as a place for new educational and creative explorations for all ages.

Presentation Number 142

Abstract Title:	**Behind the Framework**		
Presenter:	Alicia Nelson		
Mentor:	Kathleen Ryan		**Honors:** No
Co-Authors:			
Presentation Type:	Poster	**College:** College of Agricultural, Human, and Natural Resources	**Major:** Interior Design
Category:	Arts and Design		

ABSTRACT:

Civic engagement through interior design courses has served as the spark for my passion for the design process. Working with Habitat for Humanity during interior design courses since September has helped me understand that through design and building I can make a significant contribution.

During the fall semester second year Interior Design students were required to volunteer at the Palouse Habitat for Humanity (PHFH) site. During these 6 hours I shoveled gravel, assembled a roof, but most importantly helped create a materials conscious home for a PHFH partner family. Fast forward to January; using our design resources such as sketch notes and perspective drawing assignments created during the fall studio, students were assigned a group design challenge that consisted of designing an ADA two story family home for PHFH.

The project started out following the design process. We first gathered information on designing for family interactions, then met with PHFH project directors to talk about their philosophy and requirements. Following that meeting we developed floor plans for the home, and began to choose materials. The selection of sustainable materials and design strategies were directly related to the information we had learned the first week of our Materials class.

Student-based research in Interior Design has allowed for assignments to become reality. This has heightened my learning because my schoolwork is currently applicable in the "real world". Thanks to the face-to-face interactions I have had with practicing designers and "clients" I know have a better understanding of how design can impact the world; not only through our design processes, but through sustainability and the conscious choice of materiality. Through civic engagement I have realized that student based research is extremely important in order to prepare ourselves for post graduate work and for the reality of a practical built future.

Presentation Number 143

Abstract Title:	**AudioBash**		
Presenter:	Adam Denny		
Mentor:	John F. Barber		**Honors:** No
Co-Authors:			
Presentation Type:	Poster	**College:** College of Arts and Sciences	**Major:** Digital Technology and Culture
Category:	Arts and Design		

ABSTRACT:

AudioBash is an internet radio social network that allows audio content creators to collaborate in real-time in their browser window and provides innovative search tools that allow users to search for new artists visually. AudioBash was created to explore new pathways for collaborative creation and participation on the worldwide web as well as improve users' abilities to search for and discover music in online space via internet radio. The secondary aim of the project is to achieve these goals without relying on expensive technologies or web browser plug-ins with the aim of providing an experience available to the widest user base—specifically for users with computers of average performance.

Relying on jQuery UI, HTML5, PHP and MySQL, AudioBash allows users to participate in track mixing in real-time with their friends in any browser window and invite their friends to participate in audio creation with them. AudioBash also aims to allow any user to use this tool to become a broadcaster with no previous experience in audio creation. AudioBash locates its broadcasters on a world map and visualizes their popularity and following. This visual interface provides the opportunity to search for and select broadcasts based on artist popularity and location.

Presently, there is no free internet radio platform that allows anything beyond the ability for broadcasters to upload and play audio and for users to do anything but passively listen. AudioBash will provide a base for active participation in the collaborative creation of music as well as provide a meaningful meeting point between the global nature of the internet with the local nature of radio broadcasting.

Presentation Number 148

Abstract Title:	**Underserved Asian American and Pacific Islander Student Success Strategies: Case Study on At Home At School Program**		
Presenter:	Thanh-Thuy Dinah Nguyen		
Mentor:	Susan Finley		**Honors:** No
Co-Authors:	Susan Finley		
Presentation Type:	Poster	**College:** College of Education	**Major:** Education
Category:	Humanities		

ABSTRACT:

Immigrant students from Vietnam, Cambodia, and the Pacific Islands are unique in their under enrollment in postsecondary education. Sparse research is available on the educational experiences of these particular Asian American and Pacific Islander (AAPI) students; likewise, there is very little research available that is specific to the educational experiences of low socioeconomic AAPI students. The purpose of this research is to better understand the educational experiences of low income, immigrant students from underserved populations and to make recommendations for policies and programs to better serve these students. In addition to a critical review of best practices for serving these populations as they are implemented in existing policies and programs, this project uses qualitative approaches to understand the educational struggles and successes of immigrant, low-income AAPI middle and high school students who are enrolled in the At Home At School program at WSUV (http://AtHomeAtSchool.org/). With student input, we will create and evaluate socially responsive curriculum for these students that will be utilized in the AHAS summer 2014 program curriculum. From our research we intend to disseminate information policy and practice recommendations for effective educational approaches that will prepare these students for college success.

Presentation Number 149

Abstract Title:	**A Meta-Analysis of Factors Contributing to the Dilution Effect in Vector-Borne Disease**		
Presenter:	Philip Behrend		
Mentor:	David Crowder		**Honors:** Yes
Co-Authors:			
Presentation Type:	Poster	**College:** College of Arts and Sciences	**Major:** Mathematics
Category:	Organismal, Population, Ecological, and Evolutionary Biology		

ABSTRACT:

The purpose of our research project is to further explain the phenomena known in disease ecology as the dilution effect. Prior research has suggested that greater species diversity leads to lower human disease risk in vector-borne disease systems, vindicating the merits of conservation efforts. The dilution effect is a somewhat ambiguous term with many possible explanations. Our research is concerned with determining contributing factors to this occurrence.

One primary focus is properly defining "diversity." Species richness (the number of species) and evenness (relative abundance) are two measures of diversity, and our study addresses each metric separately in order to understand which aspects of diversity are most relevant to the dilution effect. We are developing a mathematical model to test each effect; to determine the importance of richness, we vary parameters related to the total number of species, while testing for evenness effects entails a manipulation of population proportions of each species. The mathematical model consists of a population matrix which produces the basic reproduction rate of a vector-borne disease.

The basic reproduction number, known as R_0, is a valuable measure of the potential for an epidemic because it is defined as the average number of secondary infections due to an initial infection. From the matrix, we are able to calculate R_0; altering parameters produces varying effects upon the basic reproduction rate, allowing us to focus our research on the parameters with the highest impact. In disease systems with long tick attachment duration, the transmission rate from the tick to tick due to cofeeding has a significant effect. In other systems, host to tick transmission is a greater determinant of disease spread.

Our research has meaningful implications for disease prevention efforts. The intended goal is to determine which aspects of diversity are most important, helping focus conservation efforts to reduce human disease risk. This model has the potential to predict future disease outbreaks based upon the R_0 value. The results from this research may contribute to a significant positive impact for third world countries where vector-borne diseases are rampant.

Presentation Number 150

Abstract Title:	**The Discovery of Far-Infrared Laser Emissions from Optically Pumped $CH_3{}^{18}OH$**		
Presenter:	Matthew Pruett		
Mentor:	Mike Jackson		**Honors:** No
Co-Authors:			
Presentation Type:	Poster	**College:** College of Engineering and Architecture	**Major:** Mechanical Engineering
Category:	Engineering and Physical Sciences		

ABSTRACT:

The discovery of the LASER in 1960 has sparked over 50 years of research into its operation and use in a variety of applications. LASER is an acronym that stands for Light Amplification by Stimulated Emission of Radiation. The laser has become integrated in many aspects of our lives, from Blu-ray devices to laser cooling and medical research. One aspect of the research conducted at Central Washington University involves the search for new laser emissions in the far-infrared, a region whose wavelength spans from about 30 to 1000 mm. A carbon dioxide laser, which emits radiation around 9 and 10 mm, is used to optically pump a gas in a far-infrared laser cavity. Using the $CH_3{}^{18}OH$ form of methanol, eight new far-infrared laser lines were observed and are reported in this work. This presentation will also provide an overview of the experimental system and methods used to generate and record far-infrared laser radiation.

Presentation Number 201

Abstract Title:	**The Arthurian Legend during the Middle Ages**		
Presenter:	Alyssa Johnson		
Mentor:	Theresa Jordan		**Honors:** No
Co-Authors:			
Presentation Type:	Oral	**College:** College of Arts and Sciences	**Major:** History
Category:	Humanities		

ABSTRACT:

One legend that has continued to capture the attention of historians for centuries is that of King Arthur and the stories that have surrounded him, though the "historic" Arthur lived in the 5th century. These were produced during the 12th-16th centuries, a time in which most of Western Europe was in a state of great change; between the Catholic Church becoming one of the largest political players the world had ever seen, to the Black Plague decimating most of the population. People needed something to hold on to and when the story of King Arthur was first written, it sparked the imagination and minds of Western Europeans and offered an escape from their mundane lives. What I want to focus on for this research project is the time in which these stories were reaching the public minds, the 12th century through the 16th century. I will be explaining the influence these stories had on the public during this time by using multiple primary and secondary sources such as Geoffrey of Monmouth and Geoffrey Ashe, as well as drawing my own conclusions, with the influence of the sources.

Presentation Number 202

Abstract Title:	**The Marked Narrative: A Rhetorical Analysis of Immigrant Narratives and their Sociopolitical Implications**		
Presenter:	Marcela Rodriguez		
Mentor:	Dr. Victor Villanueva		**Honors:** Yes
Co-Authors:			
Presentation Type:	Oral	**College:** College of Arts and Sciences	**Major:** English
Category:	Humanities		

ABSTRACT:

In post-racial America racialized stigmata and generalizations continue to dictate immigration policy and mainstream perceptions of Latino/a immigrants. New narratives— counter stories— allow us to alter the images constructed about the people around us that corrupt our ability to justly understand them. The narratives that construct our reality determine how we interact with others, how others are defined and how we define ourselves in relation to others. Out-of-date narratives function not as the exception, but the rule and they develop into the archetypal stigmata we see today in our media, in policy and in our rhetoric. Stereotypes limit, while new narratives allow us to look beyond them. They provide instances of truth and opportunities to make the distant come closer through the powerful use of language by responding to, and engaging with contemporary stigmata. Through a blend of poetry, prose and research I offer a new narrative about the Latino immigrant experience. By introducing a new narrative you redefine the type of existence allotted to the individual and their identity group. Latino/a immigrants struggle with the multiplicity of their identity of attempting to embrace the new while still holding on to their home language and culture because they are simultaneously being pressured to assimilate. The racial undertones of contemporary U.S. legislation contradict the "melting pot" imagery and instead reveal the anti-Latino and anti-immigrant sentiments that continue to exist. The new racism assigns Latino immigrants values within a hierarchical system that is rigged to place them at the bottom after centuries of marginalization and alienation. As a result, it determines the treatment they receive from the dominant group and affects their potential within that culture of racialization. Even when legal status is obtained, Latino immigrants continue to be racially and politically marked because of their race, culture, and language. While society pushes for full assimilation Latino/a immigrants are compelled to maintain the connection between the memories of their homeland and their new land through their culture and their language. The Latino immigrant narrative grapples with the "colonizers" terms and resists the loss of the dimensionality of their identity.

Presentation Number 203

Abstract Title:	**The Historical Analysis of Medieval Textiles and Tapestries**		
Presenter:	Zoe Freese		
Mentor:	Theresa Jordan		**Honors:** No
Co-Authors:			
Presentation Type:	Oral	**College:** College of Arts and Sciences	**Major:** General Physical Sciences
Category:	Humanities		

ABSTRACT:

Within Europe in the Middle Ages, the literate population belonged almost exclusively to the upper echelons of society as a small, powerful minority. Consequently, the written works of this time period were produced by the privileged, for the privileged. It follows that a variety of primary sources for this time period should be analyzed when examining medieval Europe as a multifaceted population. Much of the peasantry and other illiterate persons left behind not written accounts of their lives, but rather woven ones which are invaluable for illuminating their lives. Woven tapestries and textiles created during this time period reflect the materials available, the tools utilized, the technical skills required and the images that were important to both the weavers, and the consumers of their goods. By examining tapestries and textiles from the Middle Ages one can glean a great deal of historical information.

Presentation Number 204

Abstract Title:	**What Effect Does Wine Closure Type Have on Perceptions of Wine's Appearance, Bouquet, Taste, and Overall Quality? An Empirical Investigation.**		
Presenter:	Amy Holbrook		
Mentor:	Dennis Reynolds		**Honors:** Yes
Co-Authors:	Dennis Reynolds		
Presentation Type:	Oral	**College:** College of Business	**Major:** International Business
Category:	Social Sciences		

ABSTRACT:

During the last several decades, wineries have experimented with a variety of alternate wine-bottle closures with the intent of better protecting the wine and, in some cases, to save money and better protect the environment. Earlier studies included examination of sulfur dioxide and absorbic acid concentration and spectral measures (e.g., Skourourmounis et al., 2008) while others have looked at the benefits of difference closures relative to distribution channels (e.g., Wilson & Lockshin, 2010).

The purpose of our study is to examine consumer perception of wine appearance, bouquet, taste and overall quality based solely on closure type. Specifically, we had participants evaluate wines while providing only information regarding the type of closure: natural cork, synthetic cork, screw top, or glass seal.

More than 300 participants, aged 21 to 63 (mean age was 30). Two Bordeaux blends from Washington State were randomly poured into four tasting glasses. The wine was dispensed from nitrogen-equipped kegs to protect from any real effects of wine closure type. Each sample was placed alongside a picture of a plain wine bottle with the respective closure next to it.

As hypothesized, participants ranked the wine paired with the natural cork as significantly ($p < .001$) better on all aspects; wines with the screw top received the lowest evaluations. Interestingly, participants ranked the wines with the glass seal as low in terms bouquet, and taste but high in terms of appearance.

For wineries, these finding suggest that the consumers perceive natural cork as superior despite empirical evidence that other closures may provide a more effective seal (Mortensen & Marks, 2002). This indicates that the industry must enhance efforts toward educating consumers on alternative closure types while also understanding the effects on consumer behavior.

Mortensen, W., & Marks, B. (2002). *An Innovation in the Wine Closure Industry: Screw Caps Threaten the Dominance of Cork* [Scholarly project]. In *Victoria University*. Retrieved from vu.edu.au

Presentation Number 205

Abstract Title:	**Americans Adopting from China: Adoption Experience and the Perception of China**		
Presenter:	Emily Kassebaum		
Mentor:	Lydia Gerber		**Honors:** No
Co-Authors:			
Presentation Type:	Oral	**College:** College of Arts and Sciences	**Major:** History
Category:	Social Sciences		

ABSTRACT:

Since the early 1990s, China has been a significant source for children adopted in the United States, beginning with 200 adoptions in 1992, and peaking at more than 7,000 annually in 2004 and 2005. This has been attributed to the abundance of abandoned children—primarily girls—in orphanages following China's One-Child Policy, the relaxing of international adoption policies by China, and the allure of low-risk infants for high-achieving American couples who postponed having a family. How does the experience of adopting a Chinese child impact the perception adoptive parents gain of China, a country that enables them to fulfill their dream of family because of policies and traditions that run counter to Western sensibilities? Using a qualitative analysis of 10 adoption memoirs published between 1991 and 2010, this project explores how adoptive parents present the adoption process and their experience of the People's Republic of China and Chinese culture to their readers. Each memoir reflects a family's unique experience, and the particular context of China's policies at the time, including the recently implemented restrictions on US adoptions. Yet these memoirs written by affluent, well-educated families share several features. They for example rarely explicitly criticize Chinese culture and invariably demonstrate increased appreciation following their adoption travel, contributing to a surprisingly positive image of a country often accused of policy and human rights failures. This project contributes to our understanding of the adoption experience as a unique path toward cross-cultural engagement and of its impact on Sino-US relations over time.

Presentation Number 206

Abstract Title:	**Exposure, Interactions, and Open-Mindedness: The Road to Acceptance and Understanding through International Experiences**		
Presenter:	Kari Miller		
Mentor:	Julie Kmec		**Honors:** Yes
Co-Authors:			
Presentation Type:	Oral	**College:** College of Arts and Sciences	**Major:** Sociology
Category:	Social Sciences		

ABSTRACT:

According to past research and study abroad programs, studying internationally promises to raise cultural awareness and understanding, open-mindedness, and improve foreign language skills among many other benefits. However, there have been some speculators who criticize collegiate study abroad programs failing to see these changes in students after their time abroad. Therefore, this study aims to demonstrate that studying abroad does improve open-mindedness and social awareness, especially among students who studied in a country where they were in the racial, ethnic, or language minority.

The study was conducted with three separate groups of students. The first group consisted of students who studied abroad during summer 2013, while the second group of students did not study abroad during the summer of 2013. These two groups were surveyed in the spring and fall of 2013 to measure attitude changes. It was necessary to survey students who weren't going abroad to control for simple fluctuations due to the time between surveys. Therefore, significant attitude changes among students who studied internationally could be credited to their time abroad. Because the response rate in the fall of 2013 was very minimal, it was necessary to interview a third group of students who had studied abroad in the past to compare to the surveys collected.

After analyzing the surveys in conjunction with the interviews, the research demonstrated that studying abroad does create a more open-minded socially aware student with students who studied or traveled to places where they were in the racial, ethnic, or language minority exemplifying this change the most.

Presentation Number 207

Abstract Title:	**Relationship Between Global Mindedness and the intentions to Start a Business**		
Presenter:	Diane Castillo		
Mentor:	John K. Osiri		**Honors:** No
Co-Authors:	John K. Osiri, Kenneth Kungu		
Presentation Type:	Oral	**College:** College of Arts and Sciences	**Major:** Psychology
Category:	Social Sciences		

ABSTRACT:

Globally minded entrepreneurs are reaching beyond the shores of their countries and often internationalizing their businesses quicker than their counterparts without the global mindset (Nummela, Saarenketo, & Pummalainen, 2004). Research studies have connected global mindedness or similar constructs to entrepreneurship intentions (Pruett, Shinnar, Toney, Llopis, & Fox, 2009) but without a nuanced approach which decoupled the various entrepreneurship types (Osiri, McCarty, Davis, & Osiri, 2013). This study investigates whether globally minded students are more likely to pursue entrepreneurship versus social entrepreneurship. We report the relationship between each construct of global mindedness, namely: responsibility, cultural pluralism, global centrism, self-efficacy, and interconnectedness, and entrepreneurship type. The relationship between global mindedness and the each entrepreneurship type was examined as well. Among other things, and using survey responses of college students, our results show that the relationship betweenn global mindeness and entrepreneurial intentions is negative and not significant (-0.066), whereas the relationship between global mindedness and social entrepreneurial intentions is positive and significant (0.183*).

References

Nummela, N., Saarenketo, S., & Pummalainen, K. (2004). A Global Mindset—A Prerequistite for Successful Internalization? *Canadian Journal Of Administrative Sciences*, 21(1), 51-64.

Osiri, J. K., McCarty, M.M., Davis, J., Osiri, J. E. (2013). Entreprenuership Mix and Clasifying Emerging Sub-Fields. *Academy of Entreprenuership Journal*, 19 (2), 23-46.

Pruett, M., Shinnar, R., Toney, B., Llopis, F., Fox, J. (2009). Explaining Entrenerurial Intentions of University Students: A Cross-Cultural Study. *International Journal of Entrepreneurial Behaviour & Research*, 15 (6), 571-594.

Presentation Number 208

Abstract Title:	**Relationship between Global Mindedness and Preference for Employment**		
Presenter:	Erik Ekberg		
Mentor:	John Kalu Osiri		**Honors:** No
Co-Authors:	Kenneth Kungu, Kalu Osiri		
Presentation Type:	Oral	**College:** College of Arts and Sciences	**Major:** Mathematics
Category:	Social Sciences		

ABSTRACT:

Global mindedness has become of great interest in recent times as evident in the increase in the number of study abroad programs at universities as well as the increase of corporate social responsibility actions among companies. Researchers have shown that individuals who are globally minded tend to be more inclusive and open-minded in their dealing with others thus making them better global citizens (DeMello, 2011; Golay, 2006). Relying on survey responses of students from a Northwestern university, this study explores the relationship between global mindedness and preference of employment among college students. Effectively, this study investigates whether globally minded students prefer self-employment versus organizational employment. First, we report the relationship between each construct of global mindedness, namely: responsibility, cultural pluralism, global centrism, self-efficacy, and interconnectedness, and each employment type. Second, we combined the constructs and showed how global mindedness as a whole relates to choice of employment. Our analysis indicates a significant positive relationship (0.250**) between global mindedness and self-employment and no relationship between global mindedness and organizational employment. Our study has three major ramifications: it reinforces the importance of international business education; it indicates that a global mindset may be an asset for would-be business owners, and that employers should fill positions that allow new hires to operate entrepreneurially with graduates that are globally minded.

References

DeMello, Mary A. (2011). The impact of study tours in developing global-mindedness among PK-12 educators in Southeastern Massachusetts. *Education Doctoral Theses*. Paper 42. Retrieved on February 15, 2014 from: http://iris.lib.neu.edu/education_theses/42/

Golay, Patricia A. (2006). The Effects of Study Abroad on the Development of Global-Mindedness Among Students Enrolled in International Programs at Florida State University. *Electronic Theses, Treaties and Dissertations*. Paper 4204. Retrieved on February 15, 2014 from: http://diginole.lib.fsu.edu/etd/4204

Presentation Number 209

Abstract Title:	**Exploring Gender Differences in Global Mindedness Relative to Entrepreneurial Intentions**		
Presenter:	Haley Donwerth		
Mentor:	Dr. John Kalu Osiri		**Honors:** No
Co-Authors:	Kenneth Kungu, Dr. John Kalu Osiri		
Presentation Type:	Oral	**College:** College of Arts and Sciences	**Major:** English
Category:	Social Sciences		

ABSTRACT:

Despite the immense growth in the field of entrepreneurship, more research is still needed to better understand female entrepreneurs, and why and how they thrive in new venture creation despite social constraints. It has been shown that the entrepreneurs with a global mindset are most likely to internationalize their company compared to their counterparts who lacked a global mindset (Nummela, Saarenketo & Puumalainen, 2004); however, investigating gender differences in global mindedness has received very little attention in literature. Therefore, relying on survey responses of college students, we shed light on gender differences in five constructs of global mindedness, namely: responsibility, cultural pluralism, efficacy, global centralism, and interconnectedness. We found there were differences between males and females in all five scores, but only two were significant. Specifically, females reported higher scores than males in efficacy and global centrism. We also investigated whether there were differences between males and females on global mindedness as a whole and found that females reported higher scores in global mindedness (M=3.66, SD=0.46) versus (M=3.47, SD=0.53) for male counterparts ($t_{(160)}$ = 2.384, p=0.018). We further explored gender differences in relationships between global mindedness and the type of start-up one desires to create.

Reference

Nummela, N, Saarenketo, S, Puumalainen, K. (2004). A Global Mindset — A Prerequisite for Successful Internationalization? *Canadian Journal of Administrative Sciences*, 21 (1) 51-64

Presentation Number 210

Abstract Title:	**Investigating the Optimal Choice Load for Online Stores**		
Presenter:	Jasmyn Bolar		
Mentor:	John Kalu Osiri		**Honors:** No
Co-Authors:	John Kalu Osiri		
Presentation Type:	Oral	**College:** College of Business	**Major:** Entrepreneurship
Category:	Social Sciences		

ABSTRACT:

The purpose of this study is to find the optimal number of offerings that an online store should incorporate as part of their product strategy. Extant research shows that offering many types of the same product may present a choice overload problem (Iyengar & Lepper, 2000; Scheibehenne, Greifeneder, & Todd, 2010). Experimental research designs concerning choice overload typically presented buyers with a low number of product types (e.g. six) and a high number of product types (e.g. twenty four) (Iyengar & Lepper, 2000) and examined whether the high or low number of options resulted in greater sales. Moreover, findings from choice overload experiments relied on products displayed in physical stores, and found that offering less product options tend to result in more sales thus reinforcing the notion that *less is better*. However, to the best of our knowledge no study has further scrutinized these lower numbers to uncover the optimal number of product options that should be offered to customers. Our research contributes to existing literature by filling this gap. Our experimental set up presents buyers with one to six offerings of a particular product. We also investigate how product familiarity, previous brand preference, and need for the product may influence sales and consumer behavior outcomes such as satisfaction of product selection and post-purchase regret. We developed several hypotheses and tested them by allowing participants to make purchase selections in online store environments that offered different styles of a specific brand of a running shoe. This study provides e-commerce start-ups and online market entrants information to maximize profitability and guide long term business success in online store environments.

References

Iyengar, S. S., & Lepper, M. R. (2000). When choice is demotivating: Can one desire too much of a good thing? *Journal of Personality and Social Psychology, 79*(6), 995-1006. doi:http://dx.doi.org/10.1037/0022-3514.79.6.995

Scheibehenne, B. Greifeneder, R. & Todd, P.M. (2010). Can there ever be too many options? A meta-analytic review of choice overload. *Journal of Consumer Research, 37(3),* 409-425. Retrieved from http://www.jstor.org/stable/10.1086/651235

Presentation Number 211

Abstract Title:	**Relationship between Leadership and Resiliency and the Moderating Effect of Proactive Personality: Implications on Disadvantaged Populations**		
Presenter:	Shanee Wimberly		
Mentor:	Dr. John Kalu Osiri		**Honors:** No
Co-Authors:	Dr. John Kalu Osiri		
Presentation Type:	Oral	**College:** College of Arts and Sciences	**Major:** Psychology
Category:	Social Sciences		

ABSTRACT:

The purpose of the study is to examine the relationship between resiliency and leadership and the moderating role of proactive personality among students from underrepresented groups such as those who are first generation, of an ethnic minority, and from low income backgrounds. This study seeks to uncover how adversities experienced by underrepresented students may lead to resiliency, which may in turn be related to leadership development. Examining these relationships allows us to gain unique insight regarding any merits and demerits of having a disadvantageous background. We hypothesized that resiliency and leadership are positively related, and that proactive personality will strengthen the positive relationship. Findings from this study are of interested to educators and the general public.