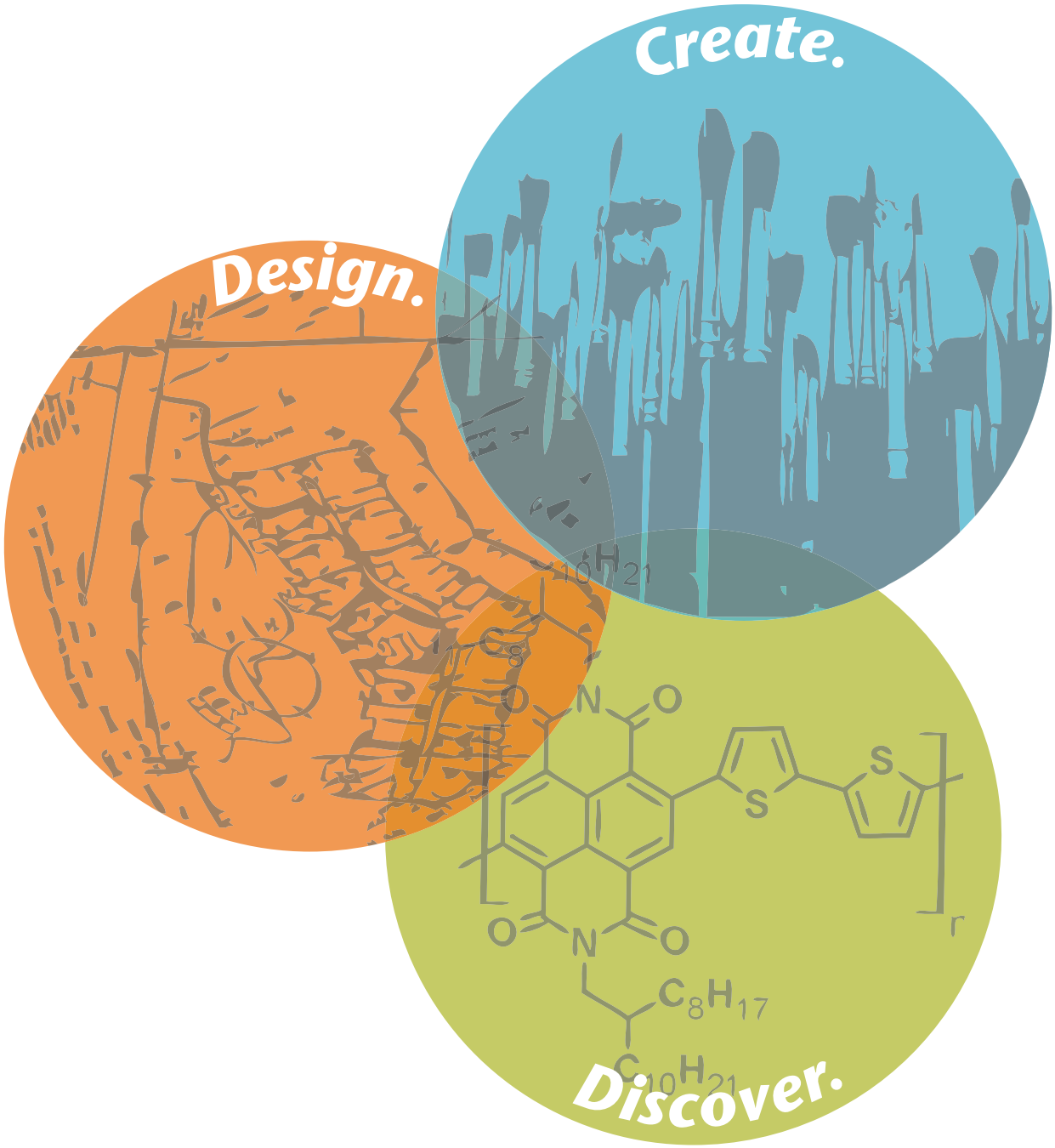
SURCA

SHOWCASE FOR UNDERGRADUATE RESEARCH AND CREATIVE ACTIVITIES



March 29, 2013

WASHINGTON STATE UNIVERSITY
UNIVERSITY COLLEGE

Showcase for Undergraduate Research and Creative Activities (SURCA) 2013

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The SURCA Committee:

Shelley Pressley, Director, Undergraduate Research, University College
Mary Sanchez Lanier, Associate Dean, University College, and Director, Pre-Health and STEM Education
Beverly Makhani, Communications Director, University College
Jeremy Lessmann, Chemistry, College of Arts and Sciences
Samantha Gizerian, Neuroscience, College of Veterinary Medicine
Jeannie Holt, Vice Provost's Office and the University College
LeeAnn Tibbals, Pre-Health and STEM Education, University College
Deb Dzuck, Director of Development, University College
Charles Snyder, WSU Global Campus
Tolulope Adesope, Assistant, Undergraduate Research, University College
Tracy Lawson, Assistant, Undergraduate Research, University College

Showcase for Undergraduate Research and Creative Activities (SURCA)

Friday, March 29, 2013
CUB M.G. Carey Senior Ballroom and Junior Ballroom

SCHEDULE OF EVENTS

12:00 – 1:30 pm	Oral Presentation Session I, Junior Ballroom — Public is welcome.
1:45 – 3:15 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 of 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 PM.
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

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Friday, March 29, 2013
CUB M.G. Carey Senior Ballroom and Junior Ballroom

AWARDS

Awards available in each category:

Crimson Award	$250
Gray Award	$150
Novice Award	$100
Early Career: FR/SO Award	$100

Awards presented at SURCA 2013 are made possible by the generous support of the Joseph L. Stubblefield Trust, and the Auvil Scholars Fellowship Program.

Showcase for Undergraduate Research and Creative Activities (SURCA)
March 29, 2013
CUB M.G. Carey Senior Ballroom

INSTRUCTIONS FOR POSTER JUDGES

At the SURCA event, you will have up to 1.75 hours at the poster session. During the first 45 minutes no students will be present and you can view as many posters as you wish; this is followed by a one-hour period when all students making poster presentations will be present for visits by judges (see times below).

Your judge's packet will include a list of the posters you will be judging and scorecards. The scorecards will not be shared with students. You will also be given a comment sheet for each poster. You can record constructive comments that can be passed on to the student on these sheets. Please turn in the Comment Sheets with your score sheets; they will be given to the students at the end of the competition. The student researchers appreciate this feedback. You will be asked to judge 2 to 3 posters. Considerations should be given to the depth and the involvement of the research project. Please do remember that these are undergraduate students we are evaluating.

2:30 – 3:15 **Open judging for posters - informal** **CUB Ballroom**
Posters are available for previewing by judges during this time. The room is otherwise closed to the public. This time is available for your convenience. You are not expected to be there the entire time and the presenters will not be present during this time. The Judge's area in the Ballroom will be open with refreshments available.

3:15 – 4:15 **Formal Judging. Presenters will be available for questioning.**
This time allows you approximately 15-20 minutes per Presenter to evaluate their knowledge and presentation. Keep in mind that the public will be in the room during the last half hour. You may use the Judge's area in the Ballroom to tabulate your scores and complete the Comment Sheet. Refreshments will be available in the Judge's area.
Score sheets <u>must</u> be turned in by 4:15.

3:45 – 5:00 **Ballroom is open to the public**. Refreshments are available in open area.

4:15 – 5:00 **Scores will be tabulated** by the Tally Committee. Comment sheets will be gathered and distributed to the Presenters. Judges will have time to visit posters as your formal judging duties will be completed

5:00 **Awards presentation.** The winners and their mentors are introduced and presented with their awards. Please stay and enjoy the ceremony.

THANK YOU FOR PARTICIPATING IN THIS EVENT. IT IS A GREAT PROFESSIONAL OPPORTUNITY FOR THE STUDENTS AND WE APPRECIATE THAT YOU COULD ADD TO THE EXPERIENCE.

Showcase for Undergraduate Research and Creative Activities (SURCA)
March 29, 2013
CUB Junior Ballroom

INSTRUCTIONS FOR ORAL PRESENTATION JUDGES

At the SURCA event, you will be appointed to one 1.5 hour oral session. There are 5 to 6 presentations during each session, with each presentation lasting 10 minutes plus 5 minutes for questions. You will be asked to judge all presentations during the session. There is a private area in the CUB Senior Ballroom after 2:30 that will be available to judges for making comments and completing scorecards and enjoy some refreshments.

Your judge's packet will include the session number (1, 2, or 3), a list of the presentations you will be judging and scorecards. The scorecards will not be shared with students. You will also be given a comment sheet for each presenter. You can record constructive comments to turn in with the score sheets. The comment sheets will be returned to the students in a sealed envelope. The student researchers appreciate this feedback. Considerations should be given to the depth and the involvement of the research project. Please do remember that these are undergraduate students we are evaluating.

Noon – 1:30	**SESSION 1**	**CUB Junior Ballroom (back half)**
1:45 – 3:15	**SESSION 2**	**CUB Junior Ballroom (back half)**
2:30 – 5:00	**Judge's Area is open to judges**	**CUB Senior Ballroom**

You may use the Judge's area in the Ballroom to tabulate your scores and complete the Comment Sheet. Refreshments will be available in the Judge's area. **Score sheets <u>must</u> be turned in by 4:15**.

3:45 – 5:00 **Ballroom is open to the public.** Refreshments are available in open area.

4:15 – 5:00 **Scores will be tabulated** by the Tally Committee. Comment sheets will be gathered and distributed to the Presenters. Judges will have time to visit posters as your formal judging duties will be completed

5:00 **Awards presentation.** Enjoy as the winners and their mentors are introduced and presented with their awards. Please stay and enjoy the ceremony.

THANK YOU FOR PARTICIPATING IN THIS EVENT. IT IS A GREAT PROFESSIONAL OPPORTUNITY FOR THE STUDENTS AND WE APPRECIATE THAT YOU COULD ADD TO THE EXPERIENCE.

Judging Rubric for Presentation of Research

Score	Goal, Hypothesis or Description	Methods	Results	Conclusions and Future Work	Presentation
5	• Project had a goal or a logical hypothesis that was stated clearly and concisely or the creative endeavor was well described. • Background information was relevant and summarized well. Connections to previous literature or works and broader issues were clear. • Broad impact beyond project clearly stated.	• Excellent choice of empirical methods to address hypothesis or goal of project or demonstrates original thinking or approach to creative endeavor. • Excellent original thinking regarding innovation of technique or choice of how creative work will be presented. • Clear discussion of controls or comparative groups; all appropriate controls or comparative groups were included.	• Substantial amounts of high quality data were presented sufficient to address hypothesis or goal of project or original, creative work was presented. • Presentation of data was clear, thorough and logical or program notes were provided that provide insight into the creative process.	• Reasonable conclusions were given and strongly supported with evidence. • Conclusion was connected to project goals or hypothesis and their relevance in a wider context was discussed. • Potential problems and alternative approaches were presented and discussed.	• All expected components are present, clearly organized, and there is a logical flow to the presentation. • Text is concise, free of spelling or typographical errors; presentation is appropriate. • Figures and tables are appropriate and labeled correctly. • Photographs/tables/graphs improve understanding and enhance visual appeal.
4	• A logical goal or hypothesis was presented or the creative endeavor was adequately described. • Background information was relevant, but connections were not clear. • Mention of Broad Impacts beyond the project.	• Very good choice of empirical methods to address hypothesis or goal or project or demonstrates very good original thinking or approach to creative endeavor. • Very good original thinking. • Clear discussion of controls or comparative groups; most controls or comparative groups were included.	• Substantial amounts of good data were presented sufficient to address the hypothesis or goal of project or creative work was presented. • Presentation of data was clear and logical or program notes were provided that provide some insight into the creative process.	• Reasonable conclusions were given and supported with evidence. • Conclusion was connected to hypothesis or project goals but their relevance was not discussed. • Potential problems and alternative approaches were presented but not discussed.	• All components are present, but not organized well. • Text is relatively clear, mostly free of spelling and typographical errors; presentation is appropriate. • Most figures and tables are appropriate and labeled correctly. • Photographs/tables/graphs improve understanding.

3	• A questionable hypothesis or project goal was presented or a description of the creative endeavor was incomplete or confusing. • Background information was relevant, but connections were not made.	• Good choice of empirical methods to address hypothesis or goal or demonstrates good original thinking or approach to creative endeavor. • Good original thinking. • Adequate discussion of controls or comparative groups; some significant controls or comparative groups were lacking.	• Adequate amounts of reasonably good data were presented to address hypothesis or project goals or the creative work seemed incomplete. • Presentation of data was not entirely clear or program notes were not entirely clear and the creative process was unclear.	• Reasonable conclusions were given. • Conclusions were not compared to the hypothesis or project goal and their relevance was not discussed.	• Most expected components are present, but not organized well. • Text is relatively clear, but some spelling and typographical errors. • Figures and tables not always related to text, or are not appropriate, or poorly labeled. • Photographs/tables/graphs limited and do not improve understanding.
2	• A questionable hypothesis was presented and was not well supported or the goal of the project was not clear or the creative endeavor was not described sufficiently.	• Method not appropriate to address hypothesis or goal of project or demonstrates no original thinking or approach to creative endeavor. • No original thinking. • Controls or comparative groups not adequately described; some controls or comparative groups missing.	• Some data were lacking, not fully sufficient to address hypothesis or project goal or the creative work was inadequate. • Presentation of data or program notes was included, but unclear or difficult to comprehend	• Conclusions were given. • Little connection to hypothesis or goal was apparent. • Potential problems and alternative approaches were not presented.	• Some expected components are present, or organization is confusing and disorderly. • Text is hard to read due to font size or color, some spelling and typographical errors. • Figures and tables not related to text, or are not appropriate, or poorly labeled. • Photographs/tables/graphs limited and do not improve understanding.
1	• The hypothesis or goal was inappropriate or not stated or the description of the creative endeavor was missing. • Little or no background information was included.	• Methods section missing. • No original thinking. • Serious lack of controls or discussion of controls.	• Results are not yet available or reproducible or the creative work was incomplete. • Presentation of data or program notes was missing.	• Conclusions were missing. • There was no connection with the hypothesis or project goal.	• Some of the expected components are present, but poorly laid out and confusing. • Text hard to read, messy and contains multiple spelling and typographical errors. • Visual aids not used.

"adapted from the rubric developed by the American Society for Microbiology and the Committee for the Annual Biomedical Research Conference for Minority Students (ABRCMS)."

Judging Rubric for Presenter

Score	Knowledge of Project	Logical Presentation	Background Information	Presence
5	Answers difficult questions clearly and succinctly.	Presentation is consistently clear and logical. Comfortably uses visual aids to enhance presentation.	Demonstrates a very strong knowledge of the project and project background.	Speaks clearly, naturally and with enthusiasm; makes eye contact. Presenter was well prepared and professional.
4	Answers most questions.	Presentation is clear for the most part, but not consistently. Comfortably uses visual aids to enhance presentation.	Demonstrates a good knowledge of the project and project background.	Speaks clearly, naturally; makes eye contact. Presenter was prepared and professional.
3	Has some difficulty answering challenging questions.	Presentation is generally unclear and inconsistent. Uses some visual aids to enhance presentation.	Demonstrates some knowledge of the project and project background.	Reads from visual aid or script some of the time. Presenter was semi-prepared and professional.
2	Has difficulty answering challenging questions.	Presentation unclear and illogical. Does not use visual aid to enhance presentation effectively.	Demonstrates poor knowledge of the project.	Reads from visual aid or script most of the time. Presenter was not prepared or professional.
1	Does not understand questions.	Presentation very confusing. Does not use visual aids to enhance presentation effectively.	Does not demonstrate any knowledge of the project.	Reads from visual aid or script all of the time. Presenter was unprepared and unprofessional.

2013 Showcase for Undergraduate Research and Creative Activities (SURCA)
JUDGES

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

Acrosstown Traffic
Alturas Analytics, Inc
Anatek Labs
Decagon Devices, Inc
Strata Incorporated
SumTech Solutions, LLC
TerraGraphics
WSU College of Engineering and Architecture
WSU Graduate Studies
WSU Health and Wellness
WSU College of Veterinary Medicine
WSU College of Agricultural, Human, and Natural Resource Sciences
WSU College of Arts and Sciences
WSU College of Education
WSU Libraries
WSU College of Business

2013 SHOWCASE FOR UNDERGRADUATE RESEARCH AND CREATIVE ACTIVITIES ENTRIES

ALPHABETICALLY BY PRESENTER

Poster No.	Presenter	Category	Title of Abstract
P-25	**Alexson, Kendra**; mentor: Mario Deprano	Arts and Design	The Sleeping Venus
P-17	**Anderson, Lindsey**; mentor: Kathleen McAteer	Molecular, Cellular, and Chemical Biology	Tandem Orthogonal Proteolysis Activity-Based Protein Profiling (TOP-ABPP) – An Analytical Platform for the Identification of Probe-Labeled Proteins in *Mycobacterium Tuberculosis*
P-27	**Armstrong, Sebastian, Johnson, Michael, Onken, Scott**; mentor: Dr. Lawrence Bruya	Social Sciences	Student Confidence in Faculty Candidates
O-1	**Backstrom, Lane**; mentor: Lydia Gerber	Social Sciences	Women Who Wrote: Female Perspectives on Social and Political Events During the Qing Dynasty (1644-1911
P-21	**Ballsmider, Lindsey and Callahan, Casey**; mentor: Dr. Krzysztof Czaja	Organismal, Population, Ecological, and Evolutionary Biology	Anti-Obesity and Aversion to Sugar Observed after Selective Vagotomy in Rats
P-35	**Barth, Victoria and Brown, Taya**; mentor: Colleen Taugher and Kim Kidwell	Applied Sciences	Rwandan Agricultural Innovations
P-20	**Baxter, Heather**; mentor: Shelley Pressley	Engineering and Physical Sciences	C02 Eddy Covariance Flux Measurements at Four Agricultural Sites Under Different Crop Management Practices in the Pacific Northwest
P-35	**Brown, Taya and Barth, Victoria**; mentor: Colleen Taugher and Kim Kidwell	Applied Sciences	Rwandan Agricultural Innovations

Poster No.	Presenter	Category	Title of Abstract
O-2	**Brown, Trevor:** mentor: Dr. Lydia Gerber	Humanities	The San Francisco Call, the Boxer Uprising, and it's Anti-Sensational Coverage
P-22	**Bruggeman, Nikki**; mentor: Dr. Lydia Gerber	Humanities	"China-Crazy": Boeing's Influence Over Washington State Delegates in the United States Congress concerning U.S. Foreign Policy towards China, 1995-1996
P-19	**Byrd, Samuel**; mentor: ChulHee Kang	Molecular, Cellular, and Chemical Biology	Crystallization and Characterization of Caffeoyl CoA O-Methyltransferase in Sorghum Bicolor
P-21	**Callahan, Casey and Ballsmider, Lindsey**; mentor: Dr. Krzysztof Czaja	Organismal, Population, Ecological, and Evolutionary Biology	Anti-Obesity and Aversion to Sugar Observed after Selective Vagotomy in Rats
P-23	**Caskin, Tyler**; mentor: Dr. Julie Stanton	Molecular, Cellular, and Chemical Biology	Positional and Functional Annotation of the Mycobacteriophage Serenity Genome
P-26	**Castillo, Savanna**; mentor: Viveka Vadyvaloo	Molecular, Cellular, and Chemical Biology	Role of MqsR Toxin during Biofilm Formation in Yersinia Pestis
P-28	**Christian, Ryan**; mentor: Amit Dhingra	Molecular, Cellular, and Chemical Biology	DNA Origami: An Analysis of the DNAjig Program for Design of DNA Nanostructures
P-30	**Clark, Nicole**; mentor: Dr. James Pru	Molecular, Cellular, and Chemical Biology	Non-Classical Progesterone Signaling in Uterine Physiology
P-43	**Cobb, Marea**; mentor: Dr. Cynthia Cooper and Dr. Alexander Dimitrov	Molecular, Cellular, and Chemical Biology	Identifying Polymorphisms within AB, WIK, and SID Zebrafish Strains
P-34	**Colburn, Zachary**; mentor: Dr. Mark Dybdahl	Organismal, Population, Ecological, and Evolutionary Biology	Do Parasites Make You Hungry or Slow? Parasite-induced Change to Consumption and its Ecological and Evolutionary Implications

Poster No.	Presenter	Category	Title of Abstract
P-18	**Colby, Sean**; mentor: Dr. James Carson	Computer Science, Mathematics, Statistics, Information Sciences	Registering in SITU Airway Cast to Lung Volume using Maya
P-31	**Corredor, Pablo**; mentor: Dr. Subra Muralidharan	Molecular, Cellular, and Chemical Biology	"Design of SNAP---Tag Fluorescent Probes to Study Dynamics Of $\alpha_V\beta_3$ Integrin Protein during Tumor Progression and Metastasis"
35	**Bunker, Teea**; mentor: Dr. Amit Dhingra	Molecular, Cellular, and Chemical Biology	Establishment of Biotechnological Tools and Strategies for Long-Term Improvement of European Pear
P-37	**Costello, Reilly**; mentor: Dr. Sarah Ullrich-French	Social Sciences	Adolescent Physical Activity Motivation
P-45	**Crowell, Miranda**; mentor: Dr. Lisa Shipley	Organismal, Population, Ecological, and Evolutionary Biology	The Role of Fiber in the Diets of a Sagebrush Generalist and a Sagebrush Specialist Species
P-74	**Cruz, Joshua**; mentor: Bala Krishnamoorthy	Computer Science, Mathematics, Statistics, and Information Sciences	Creating Barcodes for Shapes
P-3	**Dahmen, Jessamyn**; mentor: Dr. John Schneider	Computer Science, Mathematics, Statistics, and Information Sciences	Creation of an Accessible and Motivational Course on Algorithmic Problem Solving
O-3	**Darragh, Scott**; mentor: Lydia Gerber	Social Sciences	Modern China finds Roots in Korea
P-33	**David, Michelle**; mentor: Krzysztof Czaja	Molecular, Cellular, and Chemical Biology	Effectiveness of the 6-OHDA Animal Model of Parkinson's Disease
P-107	**DeFord, Daryl**; mentor: Anantharaman Kalyanaraman	Computer Science, Math, Statistics, and Information Sciences	Empirical Analysis of Space-Filling Curves for Scientific Computing Applications

Poster No.	Presenter	Category	Title of Abstract
P-62	**DeWitt, Brooke**; mentor: Julie Kmec	Social Sciences	Sexual Orientation Based Discrimination in Hiring: Variation across State and Job Gender Type
P-36	**Diaz, Christian**; mentor: Alla Kostyukova	Molecular, Cellular, and Chemical Biology	Locating the Actin Binding Site on Tropomodulin
P-38	**Farino, Zachare**; mentor: Dr. Michael Konkel	Molecular, Cellular, and Chemical Biology	Investigation of Proteins Involved in the Pathogenesis of the Food-Borne Bacterium *Campylobacter Jejuni*
P-40	**Feeney, Amanda**; mentor: Mike Skinner	Molecular, Cellular, and Chemical Biology	Use of Cytokines and Inhibitors to Validate Proposed Gene Network Regulation of Ovarian Follicle Assembly and Transition
P-4	**Finkel, David**; mentor: Dr. Bernard Van Wie	Engineering and Physical Sciences	Improving Undergraduate Engineering Education with Hands On Modules to Counter Student Misconceptions
P-6	**Fyrqvist, Kate**; mentor: Dr. Jaak Panksepp	Organismal, Population, Ecological, and Evolutionary Biology	A Description of the Relationship between Positive Rat Vocalization and Rough and Tumble Rat Play
O-4	**Galeana, Gerardo**; mentor: Dr. Julie Kmec	Social Sciences	Culturally-based Greek Letter Organizations: Academics and the Role of Advisor
P-24	**Galliher, Matthew**; mentor: Cliff Berkman	Engineering and Physical Sciences	Development of Targeted Therapeutics for Prostate Cancer
P-86	**Gardner, Brittany;** mentor: Mark Loge Nelson	Applied Sciences	In Vitro Fermentable Fiber in Byproducts Feeds
P-29	**Gavin, Patrick**; mentor: Ali Mehrizi-Sani	Engineering and Physical Sciences	Study of Fuel Cells for Efficient Integration into Power Systems
P-8	**Giron, Uris**; mentor: Kathleen Ryan and Larry Bruya	Arts and Design	Cross-Disciplinary Playscape Design through Collaboration of Kinesiology and Interior Design

Poster No.	Presenter	Category	Title of Abstract
P-70	**Godinez, Rosalinda**; mentor: Dr. Monica Kirkpatrick Johnson	Social Sciences	First-Generation Mexican-American College Students: Familial Educational Involvement and College-Going
P-72	**Gonzales, Sabrina**; mentor: Lisa Fournier	Social Sciences	A Meta-Analysis of BPD and Facial Affect Recognition
P-52	**Gonzalez, Julia (Misha)**; mentor: Dr. J. Phil Gruen	Arts and Design	Regents Hill: Understanding the Legacy of Modernism at Washington State University
P-42	**Graham, Elizabeth**; mentor: Gary Wayman	Molecular, Cellular, and Chemical Biology	Analysis of BDNF Induced Dendritic Growth in Hippocampal Neurons
P-88	**Graham, Jessica**; mentor: Erica Crespi	Organismal, Population, Ecological, and Evolutionary Biology	Effect of Age on Maternal Care Behavior in the Eastern Red-Backed Salamander (*Plethodon Cinereus*)
P-32	**Graham, Trent**; mentor: Nehal Abu-Lail	Engineering and Physical Sciences	The Transport of Escherichia Coli through Biochar Amended Soil
P-44	**Grandi, Fiorella;** mentor: Dr. Wenfeng An	Molecular, Cellular, and Chemical Biology	Redefining CpG Islands with Empirical DNA Methylation Data from Retrotransposed Sequenses
P-47	**Grant, Nathan**; mentor: Dr. Kulvinder Gill	Molecular, Cellular, and Chemical Biology	Phenotypic Evaluation of the Rht 18 Mapping Population in Wheat
P-39	**Graves, Laurel**; mentor: Shelley Pressley	Engineering and Physical Sciences	Nitrous Oxide Flux Measurements above Agriculture Systems in the Pacific Northwest
P-9	**Guajardo Jr, Pedro**; mentor: Xiao Xhang	Engineering and Physical Sciences	Pretreatments of Douglas Fir using Different Cutting Methods
P-10	**Hartley, Anna, Markel, Corinne, and Ross, Beth**; mentor: Kathleen Ryan and Bob Krikac	Arts and Design	Rural Town History Museum Co-Design

Poster No.	Presenter	Category	Title of Abstract
P-46	**Havrilak, Cody**; mentor: Dr. Ken Nash	Engineering and Physical Sciences	Synthesis and Characterization of a new Nitrogen-Containing Ligand for Metal Ions Separation
P-50	**Heeman, Jacqueline**; mentor: Dr. Raymond Quock	Molecular, Cellular, and Chemical Biology	Influence of Opoid Peptide Antiserum on the Acute Antinociceptive Effect of Hyperbaric Oxygen in Mice
P-71	**Hill, Jackie**; mentor: Lydia Gerber	Humanities	A Third Generation of Friendship?
P-53	**Houser, Elizabeth**; mentor: Eric Nilsson	Molecular, Cellular, and Chemical Biology	Pesticide Induced Epigenetic Transgenerational Inheritance of Disease-States and Tissue Abnormalities
P-75	**Hughes, Nikkole**; mentor: Dr. Amy Mazur	Social Sciences	German Reproductive Policy: The Role of Institutions in the Symbolic Pre-Adoptive Outcome of the 1992 Abortion Act
P-55	**Hylkema, Tiffany**; mentor: Dr. Michael Skinner	Molecular, Cellular, and Chemical Biology	Transgenerational DNA Methylation Variability in Sperm of Individual Rats with Ancestral Vinclozolin Exposure
P-49	**Iredale, Marley**; mentor: Dr. Lisa Shipley	Organismal, Population, Ecological, and Evolutionary Biology	Comparison of intake of a Plant Secondary Metabolite by Deer Subspecies and Season
P-57	**Johnson, Jacqueline;** mentor: Clifford E. Berkman	Molecular, Cellular, and Chemical Biology	Canine Carcinoma Cells Containing Prostate-Specific Membrane Antigen have been Identified for Therapeutic Study
P-27	**Johnson, Michael, Armstrong, Sebastian, Onken, Scott**; mentor: Dr. Lawrence Bruya	Social Sciences	Student Confidence in Faculty Candidates

Poster No.	Presenter	Category	Title of Abstract
P-11	**Johnson, Nicole;** mentor: Jason Peschel	Social Sciences	Sanford Consortium: A Simulation and Analysis of a Construction Services Proposal
P-12	**Johnston, Sara and Sullivan, Duke;** mentor: Brian Fry	Arts and Design	Aurora's Echoes
P-59	**Joyce, Patrick;** mentor: Dr. John F. Alderete	Molecular, Cellular, and Chemical Biology	Optimization of Immunohistochemistry for Detection of Trichomonas Vaginalis proteins in Prostate Tissue of Men with Prostate Cancer
P-78	**Judd, Kathleen;** mentor: Brian Kemp	Social Sciences	Documenting Domestic Lineages in the American Southwest: Turkeys (*Meleagris gallopavo*) and Dogs (*Canis lupus*)
O-5	**Kasinger, James;** mentor: Dr. Julie Kmec	Social Sciences	The Current State of LGBT policies in Universities across the US
P-82	**Kenyon, Matthew;** mentor: Lydia Gerber	Social Sciences	Chinese Historiography: A Clash of East and West
O-6	**Kidder, Lance;** mentor: Lydia Gerber	Humanities	A Revolutionary of the "Wrong" Gender; The Feminist Agenda of Qiu Jin
P-56	**Knie, Bonnie;** mentor: Dr. Holly Neibergs	Organismal, Population, Ecological, and Evolutionary Biology	Identification of Mutations in EDN2 Transcription Binding Factor Sites may be Associated with susceptibility to Johne's Disease
P-54	**Knudson, Melissa;** mentor: John Bishop and John Harrison	Engineering and Physical Sciences	Topographic Influence on Phosphorus Forms during Early Soil Development on a Mount Saint Helens Pyrociastic Flow
P-68	**Lemon, Athena;** mentor: Pamela Lee	Arts and Design	The Tangibility of Death

Poster No.	Presenter	Category	Title of Abstract
P-61	**Linde, Miles;** mentor: Dr. Gregory M. K. Poon	Molecular, Cellular, and Chemical Biology	Hydrational Control of ETS-family Transcription Factors: A Possible resolution of the "Specificity Conundrum"
P-89	**Lottes, Olivia;** mentor: Dr. Lydia Gerber	Social Sciences	Women Trafficking: Assessment of Traditional and Modern China
P-58	**Marcial, Jose;** mentor: Dr. David Field	Engineering and Physical Sciences	Effect of Strain-Annealing on Σ3 and Σ9 Coincident Site Lattice Density in Alloy 617
P-10	**Markel, Corinne, Hartley, Anna, and Ross, Beth**; mentor: Kathleen Ryan and Bob Krikac	Arts and Design	Rural Town History Museum Co-Design
P-103	**Martensen, Brianna;** mentor: Kathleen Ryan dn Larry Bruya	Arts and Design	Designer Collaboration Working with the Sciences
P-60	**Martin, Emily;** mentor: Dr. Jeb Owen	Organismal, Population, Ecological, and Evolutionary Biology	Physiological Trade-Off due to Immune Response to Blood-Feeding Ectoparasites
P-91	**Martin, Joelle and Nusbaum, Amy;** mentor: Paul Whitney	Social Sciences	Effects of Framing on Ambiguous Risk Decision Making
P-94	**Martucci, Katherine;** mentor: Samantha Swindell	Social Sciences	Stimulus Equivalence in the Domestic Dog: A Test of Inferential Learning Ability
P-51	**Mayumi, Holly**; mentor: Michael Konkel	Molecular, Cellular, and Chemical Biology	Elucidation of Campylobacter Jejuni Gene Expression Profile in Response to Intestinal Cells
P-63	**McFaul, Matthew;** mentor: Dr. Subra Muralidharan	Molecular, Cellular, and Chemical Biology	Design of Fluorescent Probes to Study Dynamics of E-Cadherin during Tumor Progression and Metastasis

Poster No.	Presenter	Category	Title of Abstract
P-99	**McFeely, Mikko;** mentor: Mike Gaffney	Social Sciences	Tri-Cities Governance Study: Phase I
P-66	**McGinnis, Molly;** mentor: Brendan Walker	Organismal, Population, Ecological, and Evolutionary Biology	Dysregulation of the Dynorphin/Kappa-Opioid Receptor System promotes Withdrawal-Induced Negative Affect
P-64	**Medina, Adan;** mentor: Karl Dane Wittrup	Molecular, Cellular, and Chemical Biology	Conversion of Antibody Fragment Libraries into Antibody-like Reagent Libraries
P-101	**Meece, Stephanie;** mentor: Cherri Wemlinger	Social Sciences	Women's Integration into the Workforce during World War II: Creating a Hybrid Gender System Lasting from 1941 to 1945
P-7	**Meehan, Jordan;** mentor: Dr. David Gunderson	Social Sciences	Synergy Builders: An Exploration in an Integrated Construction Environment
P-110	**Mejia, Eduardo;** mentor: Dr. Nicholas Lovrich	Social Sciences	Drug Recognition Experts (DRE): Impaired Driving and the Prescription Drug Abuse
P-80	**Miller, Christina;** mentor: David Crowder	Organismal, Population, Ecological, and Evolutionary Biology	Colorado Potato Beetle Vitality against Pathogens after Exposure to Predators
P-67	**Mohamed, Abdelrhman;** mentor: Haluk Beyenal	Engineering and Physical Sciences	Neutral Red as a Redox Mediator in Bioelectrochemical Systems
P-73	**Monda, Steven;** mentor: Dr. Anita Vasavada	Engineering and Physical Sciences	Head and Neck Posture during Tablet PC Use
P-95	**Monda, John;** mentor: Gary Thorgaard	Organismal, Population, Ecological, and Evolutionary Biology	Mitochondrial DNA Divergence in Sockeye Salmon in the Pacific Northwest

Poster No.	Presenter	Category	Title of Abstract
P-65	**Mui, Zeta;** mentor: McKenna Kyriss	Molecular, Cellular, and Chemical Biology	Phenotypic Effects of a Mutation at a Pair of Conserved Aromatic Residues in the Yeast Histone Chaperone Protein VPS75
P-69	**Nankani, Deepak;** mentor: Dr. McKenna Kyriss	Molecular, Cellular, and Chemical Biology	Site Directed Mutagenesis (E366W) of Yeast Juggler Protein Nap1
P-77	**Naranjo, Uriel;** mentor: Jacob Leachman	Engineering and Physical Sciences	Dynamic Cryogenic Seals to Support the Fueling of Fusion Tokomaks
P-112	**Neubauer, Rachel and Rukavina, Amanda;** mentor: Dee Posey	Social Sciences	Immediate Effects of a Single Session of Expressive Writing on Negative Affect
P-48	**Neyens, Drew;** mentor: Steven Simasko	Molecular, Cellular, and Chemical Biology	Structure-Activity Study of the Response of Vagal Afferent Neurons to Fatty Acids
P-5	**Nix, Camden;** mentor: Michael Rowe	Engineering and Physical Sciences	Mineralogical Evidence for Dacite Formation in Pre-Caldera Volcanics
P-13	**Nixon, Chad;** mentor: Dr. Jacob Leachman	Engineering and Physical Sciences	Crystal Production Cryostat for Positron Beam Experiments
P-83	**Njau, Serah;** mentor: Dr. M. Grant Norton	Engineering and Physical Sciences	Synthesis and Characterization of Nano Particle Oxide Catalyst
P-119	**Novik, Yelina and Tello, Nemer;** mentor: Dr. Andy Cavagnetto	Social Sciences	Relationship between Science Teaching and Students' Background
P-91	**Nusbaum, Amy and Martin, Joelle;** mentor: Paul Whitney	Social Sciences	Effects of Framing on Ambiguous Risk Decision Making
P-124	**Olivera, Yadira;** mentor: Dr. Thomas Power	Social Sciences	Latina Mothers' Interaction Quality and Children's Emotional Regulation
P-126	**Omdal, Reed;** mentor: Kasee Hildenbrand	Applied Sciences	Relationship of Cervical Neck Strength and Head Impacts in Youth Soccer

Poster No.	Presenter	Category	Title of Abstract
P-27	**Onken, Scott, Armstrong, Sebastian, Johnson, Michael**; mentor: Dr. Lawrence Bruya	Social Sciences	Student Confidence in Faculty Candidates
P-76	**Overacker, Ross;** mentor: Dr. Jeremy Lessmann	Molecular, Cellular, and Chemical Biology	Quantification of Lactic Acid in Chicken Cecal Samples
P-79	**Owen, Craig;** mentor: Grant Norton and Su Ha	Engineering and Physical Sciences	Catalytic Reforming of Jet-A and Methyl Oleate Transportation Fuels
P-81	**Pan, Kang;** mentor: Alla S. Kostyukova	Molecular, Cellular, and Chemical Biology	G-actin Polymerization and Interaction with Tropomodulin 2
O-7	**Patrick, Alyssa;** mentor: Peter Chilson	Arts and Design	In the Midst of Terror and Wonder: A Journey into the Lifeworld
P-120	**Puente, Veronica;** mentor: Alex Alvarez	Social Sciences	Formal Education and its Effects on the Informal Instruction in Santa Rosa de Huacaria, Perú
O-10	**Quezada, Evelyn**; mentor: Dr. Olusola Adesope	Humanities	The Impact of Higher Education Institutions on the Language Choice of Spanish-English Bilinguals
P-84	**Reinelt, Michelle;** mentor: James Pru	Molecular, Cellular, and Chemical Biology	Functional Analysis of E2A and HEB in Female Reproduction
P-87	**Ren, Yixuan;** mentor: Chengtao Her	Molecular, Cellular, and Chemical Biology	The Human MutL Homologue hMLH1: Missense Mutations and their Effects on DNA Double-Strand Break (DSB) Repair
P-90	**Rexus, Tyler;** mentor: Bin Yang	Molecular, Cellular, and Chemical Biology	Catalyzation of Biomass-Lignin to Jet Fuel
P-93	**Reyna, Cristal;** mentor: Dr. Hector Aguilar-Carreno	Molecular, Cellular, and Chemical Biology	Nipah Virus Fusion Protein HR3 Region Plays an Important Role in Modulating membrane Fusion and Viral Entry
P-123	**Rodriguez, Larissa;** mentor: Lydia Gerber	Social Sciences	The Surprising Historical Depth of Chinese Currency

Poster No.	Presenter	Category	Title of Abstract
P-121	**Ross, Beth;** mentor: Kathleen Ryan	Arts and Design	Designing a Youth Center, Building a Future
P-10	**Ross, Beth, Hartley, Anna, and Markel, Corinne**; mentor: Kathleen Ryan and Bob Krikac	Arts and Design	Rural Town History Museum Co-Design
P-112	**Rukavina, Amanda and Neubauer, Rachel;** mentor: Dee Posey	Social Sciences	Immediate Effects of a Single Session of Expressive Writing on Negative Affect
P-96	**Schneider, Sydney;** mentor: Dr. Julie Stanton	Molecular, Cellular, and Chemical Biology	Isolation and Characterization of Twenty-Two novel Mycobacteriophages
P-2	**Seversen, Erica;** mentor: Lydia Gerber	Social Sciences	Manipulation of Imperial Succession as a Path toward Female Empowerment in China
P-98	**Sexton, Thomas;** mentor: Asaph Cousins	Molecular, Cellular, and Chemical Biology	In Vivo Measurements of Rubisco Kinetics in Rice
P-85	**Smith, Kassiopeia;** mentor: David Bahr	Engineering and Physical Sciences	Growth and Properties of Various Carbon Nanotube Arrays
P-15	**Spaude, Julia;** mentor: Marian Sciachitano	Social Sciences	Cash Cropping in Guatemala positively Correlated with Chronic Malnutrition in Indigenous Mayan Population
P-41	**Stumpo, Gordon;** mentor: Patricia Fischer	Arts and Design	Princess Diana: A Study in Creative Interpretation
P-12	**Sullivan, Duke and Johnston, Sara;** mentor: Brian Fry	Arts and Design	Aurora's Echoes
P-92	**Taff, Shauna;** mentor: Michael Morgan	Molecular, Cellular, and Chemical Biology	Pretreatment with the Combination of Opioids Decrease the Development of Tolerance

Poster No.	Presenter	Category	Title of Abstract
P-119	**Tello, Nemer and Novik, Yelina;** mentor: Dr. Andy Cavagnetto	Social Sciences	Relationship between Science Teaching and Students' Background
P-105	**Thomson, Jonathon;** mentor: Gary Thorgaard	Organismal, Population, Ecological, and Evolutionary Biology	Measuring Behavioral Differences between hatchery and Wild Rainbow Trout
P-100	**Tokuno, Deven;** mentor: Dr. Douglas R. Call	Molecular, Cellular, and Chemical Biology	Can Imported Foods Serve as Vehicles for Transporting Antibiotic Resistance Genes?
P-104	**Tran, Kevin;** mentor: Asaph Cousins	Molecular, Cellular, and Chemical Biology	Immunolocalization of Carbonic Anhydrase
P-102	**Tran, Linh;** mentor: John Wyrick	Molecular, Cellular, and Chemical Biology	Mutational Study of Histone Arginine Side Chains in Yeast Reveal Vital Contacts with the DNA Minor Groove
O-8	**Turner, Jeff;** mentor: Jesse Spohnholz	Humanities	Prussian Shadows Cast on Reformation Historiography: Gustav Droysen and the Case for the Counter-Reformation
P-106	**Vallejo, Antonia;** mentor: Dr. Cynthia Haseltine	Molecular, Cellular, and Chemical Biology	Multiple DNA-Independent Interactions between Archaeal RadA Recombinase and its Paralogs in the Hyperthermopillic Acidophile Sulfolobus Solfataricus
P-125	**Van Elsberg, Justin;** mentor: Julia Cassaniti	Social Sciences	Mindfulness, Selves and Spirits in Thailand
P-97	**Wakeling, Molly;** mentor: Jason Burke (Lawrence Livermore National Lab), Steven Tomsovic	Engineering and Physical Sciences	Nuclear Excitation by Electronic Transition in U-235
P-108	**Wall, Kellie;** mentor: Michael Rowe	Engineering and Physical Sciences	From Earth to Mars: Differentiating Basaltic Eruption Style through X-Ray Diffraction Analysis

Poster No.	Presenter	Category	Title of Abstract
P-113	**Walsh, Russ;** mentor: Dr. Erica Austin	Humanities	Student Election Study 2012
P-109	**Ward, Brandi;** mentor: Joseph Harding	Molecular, Cellular, and Chemical Biology	Dihexa: A Potential Protective Agent against Neurodegenerative Insults
O-9	**Warner, Robert;** mentor: Dr. Maria DePrano and Havid Huyck	Arts and Design	The City of a Hundred Spires becomes Digital: Bridging the Digital Divide using New Media
P-111	**Weaver, Jamie;** mentor: Dr. Karl Mueller	Engineering and Physical Sciences	Solid-State NMR Study of Ethanol Adsorbed on to the Surface of Gamma Alumina
P-115	**Wedam, Kristen;** mentor: Dr. Jeb Owen	Organismal, Population, Ecological, and Evolutionary Biology	Testing Effects of Body Size, Sugar Resource and Location on Mosquito Survival
P-16	**Weisenburger, Catherine;** mentor: Kathleen Ryan and Bob Krikac	Arts and Design	Rebuilding the Core of a Small Rural Washington Town
P-118	**Westom, Logan;** mentor: Kathleen Ryan and Larry Bruya	Arts and Design	Cross Disciplinary Work to Design a Cooperative and Collaborative Playscape
P-122	**Whiteside, Samantha;** mentor: Jeb Owen	Organismal, Population, Ecological, and Evolutionary Biology	Resistance to Ectoparasites as a Result of MHC in the Domestic Chicken Infested with NFM
P-114	**Wilson, Megan;** mentor: Dr. John Wright	Molecular, Cellular, and Chemical Biology	Restoration of Motor Functioning in an Animal Model of Parkinson's Disease using a Small Molecule Mimetic of Hepatocyte Growth Factor
P-14	**Wixom, Danica;** mentor: Pamela Lee	Arts and Design	Cultural Expressions of Grief Through Art
P-116	**Wyrick, David**; mentor: Mark Kuzyk	Engineering and Physical Sciences	The Role of the Polyer Host in Reversible Photodegradation

Poster No.	Presenter	Category	Title of Abstract
P-1	**Zander, Andrew;** mentor: Charles Snyder	Social Sciences	The Role of Self-Efficacy in Online Learning
P-117	**Zavala, Jorge;** mentor: Brenda K. Schroeder	Molecular, Cellular, and Chemical Biology	Determination of Pathogenicity for Bacteria Associated with Diseased Onion Bulbs

Presentation Number O-1

ABSTRACT:

Abstract Title:	**Women Who Wrote: Female Perspectives on Social and Political Events During the Qing Dynasty (1644-1911)**			
Presenter:	Lane Backstrom			
Mentor:	Lydia Gerber			**Honors** Yes
Authors:	Lane Backstrom			
Presentation Type:	Oral	**College and Major:**	Arts and Sciences: Mathematics Education and History Education	
Category:	Social Sciences			

18th and 19th century Chinese history is full of cultural interaction, turmoil, and change. The increasing presence of the west and the pressure to modernize combined with the lingering traditional values of Confucianism and the ruling Manchu emperors created fascinating conflicts for historians to study. However, while we have a wide range of information from both Chinese and western men during this time, there is little mention about how Chinese women viewed the events of the day. Were they affected by the political situation? Were they even aware of it? Did the exposure to western culture change their outlook on the roles and rights of women? Looking at the poetry left behind by women in this time period, we will see that not only were Qing women aware of the political and social struggles, they formed their own opinions on how things should be handled. By comparing writings from the early to late Qing dynasty, we will identify a shift from traditional Confucian gender roles to the early stages of feminine empowerment. This research will add to our growing knowledge of Chinese history, especially in regards to the roles of women in society.

Presentation Number O-2

ABSTRACT:

Abstract Title:	**The San Francisco Call, The Boxer Uprising, and Its Anti-Sensational Coverage**		
Presenter:	Trevor Brown		
Mentor:	Lydia Gerber		**Honors** No
Authors:	Trevor Brown		
Presentation Type:	Oral	**College and Major:**	Arts and Sciences: History
Category:	Humanities		

With the entry of William Randolph Hearst and the rise of Yellow Journalism, newspapers in the year 1900 were spectacularly fallacious at worst and subject to scrutiny at best. This research project analyzes the newspaper *The San Francisco Call*'s coverage of two issues in the year of 1900 involving China and the United States: the Boxer Uprising and the resulting wars in China and a suspected outbreak of the bubonic plague in San Francisco's Chinatown in late May of 1900. As a Republican mouthpiece, the Call should have echoed much of the party's anti-Chinese and anti-Immigration perspective. Yet it was also edited as an intentionally anti-sensationalist paper. Comparing the Call's contemporary coverage of the Boxer Uprising to current scholarly accounts, this project sees almost complete agreement, in contrast to often glaring misinformation in the yellow press. Similarly, the Call's response to rumors of a bubonic plague outbreak in San Francisco's Chinatown served to deescalate the ensuing racial tension and fear. Interestingly, the paper's cartoons, which were syndicated, did not reflect this moderate stance toward China and the Chinese. The Call's coverage of the 1900 elections meanwhile shows strong alignment with the Republican platform. This project contributes to research on the history of journalism and highlights the value of in-depth scrutiny of primary sources, since neither the Call's syndicated cartoons, nor its allegiance with the Republican Party, or its location in San Francisco would suggest its editorials as a moderating force in a year of anti-Chinese journalism throughout the country.

Presentation Number O-3

ABSTRACT:

Abstract Title:	**Modern China Finds Roots in Korea**			
Presenter:	Scott Darragh			
Mentor:	Prof. Gerber			**Honors** No
Authors:	Scott Darragh			
Presentation Type:	Oral	**College and Major:**	Arts and Sciences: History	
Category:	Social Sciences			

The Korean War (1950-1953) or "The War to resist the United States and Aid Korea" is the most memorable war in modern Chinese history, contrary to its label as the "Forgotten War" in the West. This project analyzes and evaluates Chinese artifacts from the Korean war, such as propaganda posters and contemporary films, along with secondary research describing the training of the over two million volunteer soldiers to explore what this extraordinarily challenging war against the technically much more advanced UN troops under American command meant and still means for the People's Republic of China. It explores how Mao used the challenge of this war to create a vision of a united China, faced with an enemy he identified with rapacious capitalism and the remnants of imperialist aggression. Images merging traditional Confucian ideals of family first with Communist visions of selfless brotherhood on the other hand, and a call to have all classes in society unite in supporting the war effort created powerful Communist propaganda and added legitimacy to the new regime. Having each Chinese platoon focused on both basic literacy and education in Communist thought created a huge field school in Communist values out of its 2.5 million strong army. Today, China continues to influence the memory of the Korean War by framing the war as a righteous response to a "Hundred Years of Humiliation" from the West. This paper uses current research on history and memory to argue that the Korean War still plays a significant role today as it evokes China's strength in its complicated relationship to the United States. This project contributes to the growing field of research on war remembrance in collective memory.

Presentation Number O-4

ABSTRACT:

Abstract Title:	**Culturally-based Greek Letter Organizations: Academics and the Role of the Advisor**		
Presenter:	Gerardo Galeana		
Mentor:	Dr. Julie Kmec		**Honors** No
Authors:	Gerardo Galeana		
Presentation Type:	Oral	**College and Major:**	Arts and Sciences: Political Science / History
Category:	Social Sciences		

This study looked at the advisors of culturally-based Greek lettered organizations and their role. Specifically, this study analyzed to what extent these advisors were involved with the academics of their respective organization. Advisors were interviewed and responses were kept anonymous where advisors were asked what they believed work to help a Greek organization's academics and what they believed didn't work as well as other questions related to academics. Most of the advisors agreed that being involved in a Greek organization does affect one's academics and that action should be taken to help improve the grades of the members.

Presentation Number O-5

ABSTRACT:

Abstract Title:	**The Current State of LGBT Policies In Universities Across the US**			
Presenter:	James Kasinger			
Mentor:	Dr. Julie Kmec			**Honors** No
Authors:	James Kasinger, Jordan Rhinehart			
Presentation Type:	Oral	**College and Major:**	Arts and Sciences: Psychology	
Category:	Social Sciences			

Now more than ever before, the topic of rights for individuals who are lesbian, gay, bisexual, or transgendered (LGBT) is at the forefront of debate in social and political arenas, the intended outcome of which is dissemination of more protective social policy. It is important for this movement to understand the climate in which these policies are adopted if the movement is to succeed in its mission to secure LGBT rights. The current project is concerned with describing the general climate surrounding the adoption of LGBT anti-discrimination policies in four-year land based universities in the United States. In particular, we are interested in the answers to the following research questions: (1) What kinds of universities are early, late, or non adopters of LGBT anti-discrimination policies? And (2) How substantive is the content of these policies? We are especially interested in identifying the factors that play a role in the adoption of these policies within universities, whether the patterns of adoption reflect the cultural and political climate, geographic proximity to more progressive schools, demographic characteristics of the schools and state, or institutional prestige. Our sample of 270 U.S. universities accounts for all land-based, four-year degree granting institutions in the United States with an enrollment over 10,000 students and a collective student enrollment of roughly 6.5 million students or 53% of students in colleges that grant 4 year degrees. This research project is still in the data collection stage, as we are in the process of conducting a content analysis of university LGBT policies, but we are beginning to see a trend between the presence of state LGBT anti-discrimination policies and a greater density of universities with protective policies in the state. Upon completion of this project, we will promote these results publicly with data dissemination via the web. Ultimately our data will lend traction to the LGBT movement and its allied partners.

Presentation Number O-6

ABSTRACT:

Abstract Title:	**A Revolutionary of the "Wrong" Gender; The Feminist Agenda of Qiu Jin**		
Presenter:	Lance Kidder		
Mentor:	Lydia Gerber		**Honors** No
Authors:	Lance Kidder		
Presentation Type:	Oral	**College and Major:**	Agricultural, Human, and Natural Resource Sciences: Animal Science
Category:	Humanities		

A key contributor to China's cultural transformation of the early 20th century was the feminist revolutionary Qiu Jin (1875-1907). An accomplished speaker, a prolific writer, and inspiring teacher, she presented the lifestyle of a strong, accomplished, and independent woman and promoted it through her publications. Robust even through torture and execution, Qiu Jin refused to betray her fellow conspirators in the anti-Manchu revolution.

This paper examines Qiu Jin's life and her feminist and revolutionary agenda through her own writings, the eyes of her contemporaries, and current scholarship. It argues that her complex and multi-faceted life experience supported and made influential her message of liberation for her students and followers and led to her status as an icon of Chinese feminism. From her beginnings as a daughter of wealth and unusual freedom, through her unhappy arranged marriage, all the way to her position at the core of a movement that would fundamentally change the nation, she was a force to be reckoned with. She had experienced it all. She had bound feet, but knew what she could accomplish despite this deformation and challenged others to do the same. She had been in a dysfunctional marriage, but had left both her husband and her children in 1904, to study abroad in Japan and to experience life unshackled. She had gained economic independence by working to support herself. She had been a student and a teacher and a revolutionary, all this in only the last three of her thirty-one years of life. She was able to understand the challenges women faced, because she had experienced them herself and mastered them with courage and candor. This project contributes to our understanding of the vigor and radicalism characterizing the early women's movement in China.

Presentation Number O-7

ABSTRACT:

Abstract Title:	**In the Midst of Terror and Wonder: A Journey into the Lifeworld**		
Presenter:	Alyssa Patrick		
Mentor:	Peter Chilson		**Honors** Yes
Authors:	Alyssa Patrick		
Presentation Type:	Oral	**College and Major:**	Communication: Communication
Category:	Arts and Design		

"Les vignes la-bas c'est tres vielle" said Isabelle Foret, the wine journalist with whom I was interning. *The vines over there, they are very old.*

I smiled and cleared my throat and looked over at her. My eyebrows scrunched and my eyes wandered upwards, hoping that if they could just reach back far enough they may find the French hiding in my brain more easily.*"Oh, tres interessant!"* I managed.
"Oui!" Isabelle smiled and nodded, keeping her blue eyes on the road and both hands on the wheel of her small, silver Peugot.

Driving with Isabelle that day on my way to a weekend amongst her French colleagues set me in the midst of two opposing emotions: terror and wonder. Over the course of the five months I lived in France I found myself in that vulnerable place often. It opened my mind in a way I hadn't experienced before and I began to rethink my ideas about education. I wanted to know if other travelers had felt the same, if there were theories about the effects of being immersed in the unfamiliar. When I arrived back in America I found answers to my questions amongst the great travel writers Pico Iyer, Paul Theroux and Edith Wharton, and education theorists Mary Kalantzis and Bill Cope. In his essay *Why We Travel,* Iyer wrote that "all good trips are, like love, about being carried out of yourself and deposited in the midst of terror and wonder." My essay focuses on a weekend when I was the most fully immersed in French culture and aims to explore and expound on Iyer's idea, showing how living in that vulnerable place is a unique form of education about the familiar.

Presentation Number O-8

ABSTRACT:

Abstract Title:	**Prussian Shadows Cast on Reformation Historiography: Gustav Droysen and the Case for the Counter-Reformation**			
Presenter:	Jeff Turner			
Mentor:	Jesse Spohnholz			**Honors** No
Authors:	Jeff Turner			
Presentation Type:	Oral	**College and Major:**	Arts and Sciences: Religious Studies / Philosophy	
Category:	Humanities			

I participated in a research group during the Fall 2012. I agreed to read, participate, and produce a research paper about the topic of historiography. My project focused on nineteenth-century Reformation historiography.

In 1946, a Catholic historian, Hubert Jedin, identified a debate about whether to use the term "Counter-Reformation" or "Catholic Reform" in order to describe Catholics in the Reformation. He wrote about the origins of these terms in years, that one became normal use in the 1860s and the other in the 1870s in Germany. He did not describe what was going on in the 60s and 70s in Germany. Since then, one historian wrote that this context ought not to be ignored. That was the last thing he said about it. My research involves context for the origin of these terms.

I found that historians using these terms wrote biasedly. Germany had just unified under Prussian assertiveness in 1871. Historians thought that the past progressed to the present. That meant that Protestants thought that history ought to show the progress to a modern, Protestant Germany. Catholic historians, under the same principles, thought that history ought to show that Germany was multi-religious. This thinking further continued with the kulturkampf laws in 1873 with an increased separation between the two groups. These historians are the ones who normalized the terms that Jedin identified.

In order to better understand the influence of this context, I did a case study. I read the History of the Counter-Reformation (Geschichte der Gegenreformation, 1893) by Gustav Droysen, a Lutheran professor of history. I found that his history about the Counter-Reformation focused around the idea of a unified, Protestant Germany. This is one of the historians who used the term "Counter-Reformation" that Jedin identified. I pose that these terms, which historians still use as the main ways of talking about this period, are not just terms, but rather products of two groups of people with two agendas in a historical context. Modern historians ought to understand historiography, and this case study shows why.

Presentation Number O-9

ABSTRACT:

Abstract Title:	**The City of a Hundred Spires Becomes Digital: Bridging the Digital Divide Using New Media**			
Presenter:	Robert Warner			
Mentor:	Dr. Maria DePrano, and David Huyck.			**Honors** Yes
Authors:	Robert Warner			
Presentation Type:	Oral	**College and Major:**	Arts and Sciences: Digital Technology and Culture	
Category:	Arts and Design			

The Internet is increasingly becoming a platform for the dissemination of information on a wide range of subjects, from a wide range of sources, presented in a variety of methods. According to the Pew Research Institute, nearly 50% of American adults today lack home Internet connections, but 88% have access to cellphones or smartphones, which provide a connection to the Internet. For this project, five historically significant monuments were selected in Prague, Czech Republic for study. The city of Prague was chosen for the vast range of history, and the variety of architectural artifacts that were preserved. Each monument was studied and an account of the building's history was recorded, to provide the text for an interactive, immersive website. The final project was designed to increase the amount of information readily available from a wide range of platforms, from traditional desktops to mobile devices such as smartphones and tablets. The final presentation of the project is a widely available website, built using modern web technologies such as JavaScript and HTML5 and using original photographs. Information, presented in a way that is available to those who would not otherwise have access to it, is what can promote global learning, ultimately bridging the "digital divide".

Presentation Number O-10

ABSTRACT:

Abstract Title:	**The Impact of Higher Education Institutions on the Language Choice of Spanish-English Bilinguals**			
Presenter:	Evelyn Quezada			
Mentor:	Olusola Adesope			**Honors** Yes
Authors:	Evelyn Quezada, Olusola Adesope			
Presentation Type:	Oral	**College and Major:**	Arts and Sciences: English: Rhetoric and Professional Writing	
Category:	Humanities			

Language is a dynamic form of communication that constantly changes and adapts to contemporary norms. Spanglish is a much debated and controversial phenomenon. Some scholars argue that code switching/mixing is a choice that is dependent on varying factors; others argue that code switching/mixing is not a choice but marks a speaker as a low income or lowly educated individual. Our previous study explored the specific factors that influence students' language choice at a large University in the Pacific Northwest, to identify the various elements that influence language choice and the use of Spanglish, beside social status. Results found that participants tended to follow the researcher's initial language choice and code-switched due to context. There was little correlation between income status and language choice and Spanglish use. In sum, Spanglish did not occur as frequently as anticipated and it occurred unsystematically throughout the interview sessions with no apparent pattern or notable reasoning. Our current study aims to further explore the language choice of Spanish-English Bilinguals in the state of Washington, this time focusing on the role that the institution of higher education plays on individual's language choice. This study takes place at another large university in the Pacific Northwest.

Presentation Number P-1

ABSTRACT:

Abstract Title:	**The Role of Self-Efficacy in Online Learning**		
Presenter:	Andrew Zander		
Mentor:	Charles Snyder		**Honors** No
Authors:	Andrew Zander		
Presentation Type:	Virtual	**College and Major:**	Arts and Sciences: Psychology
Category:	Social Sciences		

The practical application of Psychology has been a driving force in American Psychology since its beginnings. One psychologist whose work has been representative of this approach is Albert Bandura, a pioneer in social cognitive theory (SCT). One of his many important contributions to Psychology is the concept of self-efficacy, that is, our perceptions of our abilities and how they affect our behavior in particular situations. Teachers and students both face unique challenges in the emerging platform of online learning. The principles of self-efficacy can be applied to online learning by informing teachers on best practices to foster development of self-efficacy in students through feedback and curriculum design. For students, self-efficacy can inform them on how to self-regulate their cognitions and actions as well as properly judge their skill level of a given task and put themselves in situations that would increase their self-efficacy. Increasing self-efficacy can lead to greater academic achievement as well as improvements in other important aspects of life. Therefore, it is in the interest of both students and teachers to increase self-efficacy in order to give students the best possible chance at having a rewarding education and life.

Presentation Number P-2

ABSTRACT:

Abstract Title:	**Manipulation of Imperial Succession as a Path toward Female Empowerment in China**			
Presenter:	Erica Seversen			
Mentor:	Professor Lydia Gerber			**Honors** No
Authors:	Erica Seversen			
Presentation Type:	Virtual	**College and Major:**	Arts and Sciences: Social Science-Criminal Justice	
Category:	Social Sciences			

Confucian ideology was the political and social foundation of China throughout much of its history. It emphasized that political leaders be educated, therefore imperial examinations became the guidepost of an individual's worthiness to rule; however women were excluded from taking these examinations. In some dynasties they were expressly banned from politics. Yet Chinese history is ripe with examples of women who executed critical political decisions. How were these women able to ascend to the throne and assert their political voice in spite of substantial bureaucratic and social obstacles?

This project focuses on four examples of women that possessed demonstrable control of the state: Empress Feng (442-490) - Northern Wei dynasty, Empress Wu Zetian (625-705) - Tang dynasty and later Emperor of the Zhou dynasty she founded, Empress Yingtian (907-1125) of the Liao dynasty and Empress-Dowager Cixi (1835-1908) of the Qing dynasty. It analyzes their political careers and argues that all four made use of the only realm of power given to women in traditional China, their biological or social offspring. These women successfully manipulated who would be named as heir, preferably young or weak males, and then ruled by proxy in their name. In these circumstances Confucian doctrine with its mandate of filial piety actually benefitted women with a desire for power since a son had to practice filial piety and show respect for and obey his mother. This project contributes to our understanding of the impact of Confucianism on gender roles in Imperial China.

Presentation Number P-3

ABSTRACT:

Abstract Title:	**Creation of an Accessible and Motivational Course on Algorithmic Problem Solving**			
Presenter:	Jessamyn Dahmen			
Mentor:	Dr. John Schneider			**Honors** No
Authors:	Jessamyn Dahmen, John Schneider			
Presentation Type:	Poster	**College and Major:**	Engineering and Architecture: Computer Science	
Category:	Computer Science, Mathematics, Statistics, and Information Sciences			

Computers have truly revolutionized the way we live. This revolution was made possible not just by the development of smaller and faster electrical circuits, but also through the development of precise algorithmic problem-solving techniques. Algorithmic problem solving is essential in the field of computer science but mastery of this skill is important in all branches of science and engineering. Fostering a broad understanding of algorithmic problem solving is critical to our global success. This project entailed teaching algorithmic problem solving via written and visual means. We used the Python programming language which is a powerful language used throughout industry and academia. Despite its power, it is a wonderful first language for those with no prior programming experience.

We wrote a Python textbook that guides those with no prior programming experience to the point where they are able to solve any number of challenging problems. Companion videos were also produced to guide the learner through various exercises. These media teach readers and viewers how to create programs that solve complex and meaningful problems and also inculcate precise algorithmic skills that are pertinent to problem solving in nearly all disciplines.

Presentation Number P-4

ABSTRACT:

Abstract Title:	**Improving Undergraduate Engineering Education with Hands On Modules to Counter Student Misconceptions**		
Presenter:	David Finkel		
Mentor:	Dr. Bernard Van Wie		**Honors** Yes
Authors:	David Finkel		
Presentation Type:	Poster	**College and Major:**	Engineering and Architecture: Chemical Engineering
Category:	Engineering and Physical Sciences		

Current undergraduate engineering education often leaves many students with a surprising lack of core conceptual understanding about the processes they are taught. Interviews conducted with prior students of a fluid mechanics and heat transfer course for chemical engineering students showed a startling degree of conceptual difficulties.

This undergraduate engineering education project emphasizes hands-on learning with student-to-student and professor or TA-to-student interactions through a guided inquiry that aims overcome the hurdles faced by traditional lecture-based engineering education. The inquiry is guided by conceptual questions and thought exercises as students observe fluid flow and heat exchange phenomena taking place in miniature scale dollar bill-sized industrial processes. Students explore the processes with guided worksheets and interactions in order to internalize the conceptions necessary for understanding the system while simultaneously having preconceived and possibly incorrect conceptions challenged and dismantled. Students find visualization and the interactions surrounding them make the mathematical relationships become meaningful and cause them to take away the correct conceptions and rethink the incorrect ones.

Presentation Number P-5

ABSTRACT:

Abstract Title:	**Mineralogical Evidence for Dacite Formation in Pre-Caldera Volcanics**			
Presenter:	Camden Nix			
Mentor:	Michael Rowe			**Honors** No
Authors:	Camden Nix, Michael Rowe			
Presentation Type:	Poster	**College and Major:**	Arts and Sciences: Environmental Science	
Category:	Engineering and Physical Sciences			

Rare, large caldera forming eruptions, such as Yellowstone, have the potential to cause significant and widespread devastation. Therefore, understanding how these types of magma chambers can build up to such catastrophic eruptions is an important objective of volcanologic studies. The Jemez Mountains in New Mexico, with volcanism dating prior to 20 million years, is one of the three largest Quaternary continental caldera systems in the U.S. The volcanic field is largely built of intermediate to silicic lavas, with dacites being the dominant unit prior to the caldera-forming eruptions (~2000km^3), taking place at ~1.6 and 1.2 million years ago. Intermediate (dacitic) lavas of the Tschicoma formation, the focus of this study, were erupted over a period from ~7-2 million years ago. This study aims to examine how these dacites formed and what the implications may be for the formation of the caldera-forming catastrophic eruptions beginning at 1.6 million years ago. While previous studies have focused on the whole rock geochemistry of these pre-caldera volcanic rocks, which proposed that the Tschicoma dacites (intermediate) were created by simply mixing two different components, a basaltic andesite (mafic) and a granite (silicic) (Wolf et al., 2005; Rowe et al., 2007). The focus of this research will to utilize micro-geochemical techniques through electron microprobe analysis and laser ablation ICP-MS, to analyze the mineral phases within the dacites to re-evaluate models previously suggested for the formation of the Tschicoma dacites. These techniques will also allow us to examine chemical populations of minerals and the zonation within individual grains to determine if a simple two-component mixing model can generate such mineralogical variations. Ultimately this work will build towards a better understanding of pre-eruptive conditions of caldera-forming eruptions and important implications for the next 'super eruption' from the Jemez Mountains.

Presentation Number P-6

ABSTRACT:

Abstract Title:	**A Description of the Relationship Between Positive Rat Vocalizations and Rough and Tumble Rat Play**		
Presenter:	Kate Fyrqvist		
Mentor:	Dr. Jaak Panksepp		**Honors** Yes
Authors:	Kate Fyrqvist, Emily McLaughlin, Jaak Panksepp		
Presentation Type:	Poster	**College and Major:**	Veterinary Medicine: Neuroscience
Category:	Organismal, Population, Ecological, and Evolutionary Biology		

Past work has correlated rat rough-and-tumble play with a high incidence of 50-kHz ultrasonic vocalizations (USVs) that indicate a positive affective state.[1, 2] However, over the course of a play session, 22-kHz calls often emerge; a sign that something went wrong and the play isn't as "fun" anymore for at least one of the rats. [3] Traditionally play is empirically measured by frequencies of *dorsal contacts* and *pins*: the brief touching of a rat playmate's nape with the forepaws (dorsal contact) and the trapping of a playmate on its back (pin). However, many other behaviors emerge over the course of a play session, such as wet-dog shakes, genital sniffing, hind leg kicks and the production of audible squeaks. These behaviors will be looked at in conjunction with the 50-kHz and 22-kHz vocalizations to determine correlations between various aspects of play and their accompanying vocalizations.

References

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3. Panksepp, J., & Biven, L. (2012). *The archaeology of mind: Neuroevolutionary origins of human emotions*. New York: W.W.Norton & Company. 351-387.
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Presentation Number P-7

ABSTRACT:

Abstract Title:	**Synergy Builders: An Exploration in an Integrated Construction Environment**		
Presenter:	Jordan Meehan		
Mentor:	Dr. David Gunderson		**Honors** No
Authors:	Jordan Meehan (primary); Jamie Armintrout, Matthew McGowan, Scott Kennedy, Kyle Agnew, Peter Roberts		
Presentation Type:	Poster	**College and Major:**	Social Sciences
Category:	Arts and Design		

In an ever changing and complex industry of construction, the concept of integrating with architects, engineers and construction professionals has become commonplace for many general contractors and design-builders. The WSU Construction Management program has looked to further the education of its students in the field of design-build construction techniques, and provides a medium from which students can develop deep understanding of how it differs from traditional construction procurement. Design-build is not just a contract type, but an entirely different way of looking at the design and construction process.

This February, for the third consecutive year, the WSU Design-Build team competed in the Region VII ASC (Associated Schools of Construction) Competition in Reno, Nevada, placing third. While the problem consisted of a full construction services proposal including but not limited to a project management plan, estimate, schedule, site safety and logistics plan, risk analysis and sustainability solution, the design-build category also required the creation and integration of a student-created building design. While the aforementioned proposal, and subsequent presentation of thirty minutes with ten minute question and answer by industry professionals marked the culmination of all of our hard work, it was the process of creating our simulated company that led to the greatest learning and research.

The process of prequalification has revolutionized the construction procurement process. No longer does the lowest cost proposal always get the work, as overall benefit to the owner is taken into account. Design-Build as well as other alternative delivery methods allow for qualifications of the company and team to play a key factor in which company gets the contract. In order to procure work in this fashion, companies still require top notch estimators, but also cohesive teams and applicable experience to be chosen over the competition. Each year, the design-build team creates a company, its values, market sector, relevant experience, and assembles a well rounded team. The teams that place also must gain in depth understanding of industry best practices and process in order to fully understand design-build. This prequalification proposal is the culmination of that research.

Presentation Number P-8

ABSTRACT:

Abstract Title:	**Cross-Disciplinary Playscape Design through Collaboration of Kinesiology and Interior Design**			
Presenter:	Uris Giron			
Mentor:	Kathleen Ryan, Larry Bruya			**Honors** No
Authors:	Uris Giron			
Presentation Type:	Poster	**College and Major:**	University College: Intended major - Interior Design	
Category:	Arts and Design			

Goal: The goal of this project was to see how participating in a cross-disciplinary collaboration workshop affected confidence of Interior Design and Kinesiology students.

Background: A group of Interior Design and Kinesiology students collaborated to design a children's playscape, using a participatory design process. A workshop setting organized the students into cross-disciplinary teams.

Methods: Student participants completed a Likert scale survey before the workshop to determine what students understood about cross-disciplinary collaboration, the design process, and their own experiences as children at play. The students were assigned to teams with a mix of Kinesiology and Interior Design. There were 14 Kinesiology and 28 interior design students participating. The teams used images of the site and children's drawing depicting their ideal forms of play. All these images served as inspiration for the playscape. During the end of their project, the students were given a post survey on how the students felt about their cross-disciplinary collaboration skills and how well they understood the process of design. This poster focuses on the design students understanding.

Results: The pre-workshop survey results show that a majority of the design participants demonstrated a lack of understanding about cross-disciplinary collaboration. Fifteen of twenty-five (60%) Interior Design students disagreed/strongly disagree about how aware they were about the design process as approached by other disciplines. Their understanding of collaboration varied from little to some understanding of how to collaborate.

The post-survey showed a significant change in almost every design participant on their understanding of how to collaborate effectively. For the same question twenty-two of twenty-three (96%) Interior Design students answered agree/strongly agree about how aware they were about the design process as approached by other disciplines.

Conclusion: The significance of these results is that during the workshop design students improved their understanding of cross-disciplinary collaboration and the design process.

Collaboration is said to be a must for young professionals to be successful in today's job market, no matter the profession. Collaboration differs depending on the needs of the participants. Observing how different groups of students work together and gain understanding of diverse approaches will benefit the students' future endeavors.

Presentation Number P-9

ABSTRACT:

Abstract Title:	**Pretreatments of Douglas Fir Using Different Cutting Methods.**			
Presenter:	Pedro Guajardo Jr			
Mentor:	Xiao Zhang			**Honors** No
Authors:	Pedro Guajardo Jr			
Presentation Type:	Poster	**College and Major:**	Engineering and Architecture: Electrical Engineering	
Category:	Engineering and Physical Sciences			

To overcome the limitations that lignocellulosic biomass has for the development of fuels and bioproducts, many chemical, thermal, and biological pretreatments have been proposed. The effectiveness of those pretreatments has been evaluated mainly based on the sugar yield and the hydrolysability of resulting substrate. There is a little understanding about which method is best used to prepare the biomass before beginning the pretreatment method. The effects of those pretreatments on the structure of biomass, production of chemical intermediates, carbohydrate recovery, and enzymatic hydrolysability of pretreated substrate were determined. The results obtained from the study can help us to optimize softwood pretreatment process to maximize the production of biofuels and biobased products.

Presentation Number P-10

ABSTRACT:

Abstract Title:	**Rural Town History Museum Co-Design**			
Presenter:	Corinne Markle, Anna Hartley, and Beth Ross			
Mentor:	Kathleen Ryan & Bob Krikac			**Honors** No No Yes
Authors:	Corinne Markle, Shannon Coughlin, Anna Hartley, Kathleen Ryan, Bob Krikac			
Presentation Type:	Poster	**College and Major:**	Agricultural, Human, and Natural Resource Sciences: Interior Design (all)	
Category:	Arts and Design			

A team of four interior design students employed co-design theory to engage with the residents of a small rural town in Washington; designing a history museum in an underutilized downtown structure. Co-design redefines the lines between the designer and user by directly connecting the user with the design process. Design must combine the user's project goals and desires with the insight of design professionals. The qualitative methodology included site analysis, case studies, and utilized a participatory design process. The student-led team met and discussed with the community the viable options for the future museum. The community guided the content of the many display options and the design team narrowed the focus and determined the placement and presentation.

The charge was to combine and condense the thoughts of the community into one solid and cohesive design. During this process the team was able to utilize individual strengths to capitalize on design opportunities while moving the project forward. A timeline of the town was the concept catalyst that tied the exhibits back to the community and into the physical space. The intersection of new and old influenced the design of unique interior forms.

This project challenged the students to present ideas to others and the community in a way that creatively interpreted feedback into physical designs. The design represented the community's needs and resulted in an appropriate intervention for the space.

The design has emotionally impacted the community in such a way they feel more connected to the history of their town. The co-design process facilitated the development of a place theory, seen with emotional attachment for both the community and design team members who worked on this museum. The future of this design is currently in pursuit of funding and grants for construction.

Presentation Number P-11

ABSTRACT:

Abstract Title:	**Sanford Consortium: A Simulation and Analysis of a Construction Services Proposal**			
Presenter:	Nicole Johnson			
Mentor:	Jason Peschel			**Honors** No
Authors:	Nicole Johnson (Captain), Erika Wier, Noah Martin, Joel Palmer, Jonathan Osman, Ryan Garris			
Presentation Type:	Poster	**College and Major:**	Engineering and Architecture: Construction Management	
Category:	Social Sciences			

Each February, the School of Design + Construction at WSU sends teams to compete in a number of categories at the Region VI and VII ASC Competition in Reno, Nevada. These competitions are sponsored by industry-leading contractors and look to simulate the stress, experience, and creative solutions that go into acquiring construction contracts and managing a construction project. The commercial building division specifically requires teams of six undergraduate students to form project teams assuming professional roles as Project Managers, Superintendents, Estimators, and Project Engineers. Students are required to apply their research, internship experience, and classroom learning to assume these professional roles years beyond their experience level in order to sell themselves as professionals with solutions to real industry problems.

The commercial proposal was centered on developing a construction services proposal and providing a number of management solutions for the Sanford Consortium, an $80 million, 150,000 square foot laboratory space located in La Jolla, CA. The facility will be used for stem cell and regenerative medicine by a number of high-profile world leaders in biomedical research. Each of the thirteen university teams were given the construction plans and eighteen hours to develop formal proposals addressing the budget, financial status for the design and construction phases, construction schedule, site coordination and utilization plans, quality and safety plans, change orders, relationship management strategies, risk analysis, sustainability solutions, and management strategies for the project, including a number of real-life problems that occurred during the construction of the project. These formal proposals were submitted and then orally presented to the company's upper management the next morning with the intent of demonstrating which project team would be most competent in securing the job and ensuring a profitable endeavor for the company. This proposal submitted by the WSU team earned first place in the 2013 competition by a significant margin.

Presentation Number P-12

ABSTRACT:

Abstract Title:	**Aurora's Echoes**			
Presenter:	Sara Johnston and Duke Sullivan			
Mentor:	Brian Fry			**Honors** No
Authors:	Devin Freimark, Michael Kamradt Sara Johnston, Duke Sullivan			
Presentation Type:	Poster	**College and Major:**	Arts and Sciences: Digital Technology and Culture	
Category:	Arts and Design			

Aurora's Echoes gets its name from light and sound. We love creative works that surprise us, find splendor in the truly unexpected, and stay with us even after we put them down. Aurora's Echoes signifies a new kind of aesthetic. It is a delicate sort of light, without grand gestures and crafted with a sense of imperfection that echoes through us.

Through English 357: Literary Editing and Publishing, Aurora's Echoes worked as a team to create a Literary Journal from start to finish including assigning positions, marketing, website, submissions guidelines, stylesheet, and journal layout.

The journal is a representation of a semester long endeavor to organize, create, and publish a literary journal. Each group member created a pitch idea, and as a group, we voted and selected Aurora's Echoes, elected officials, as well as created and carried out a plan for gathering submissions and publishing.

Presentation Number P-13

ABSTRACT:

Abstract Title:	**Crystal Production Cryostat for Positron Beam Experiments**			
Presenter:	Chad Nixon			
Mentor:	Dr. Jacob Leachman			**Honors** No
Authors:	Chad Nixon, Dr. Jacob Leachman			
Presentation Type:	Poster	**College and Major:**	Engineering and Architecture: Mechanical Engineering	
Category:	Engineering and Physical Sciences			

Positrons are the antiparticles of electrons produced in nuclear reactions. Despite the widespread use of positron technology in medical, scientific, and energy applications, the efficiency of positron source utilization remains less than 1 %. The low efficiency is due to positron destruction during moderation; emitted positrons must be filtered through a moderator material to restrict the re-emitted positrons to a useable and defined energy range. Ultra-high efficiency positron moderation with solid hydrogen has the potential to increase the efficiency of commercially available positron sources by an order of magnitude, an enabling advance for antimatter storage; however the characteristics of solid hydrogen as a positron moderator have never been investigated. This poster discusses the final design and construction of an experimental cryostat to create cryogenic crystal targets for positron moderation studies. Heat transfer and thermodynamic calculations will be presented along with the completed physical apparatus. Future system testing with argon, neon, and hydrogen will also be discussed.

Presentation Number P-14

ABSTRACT:

Abstract Title:	**Cultural Expressions of Grief Through Art**			
Presenter:	Danica Wixom			
Mentor:	Pamela Lee			**Honors** No
Authors:	Danica Wixom			
Presentation Type:	Poster	**College and Major:**	Arts and Sciences: Humanities General Studies	
Category:	Arts and Design			

My father died suddenly in October, 2003, when I was twelve years old. Art was one of the primary mediums in which I expressed my grief. In spring 2012, I began to explore how other artists have expressed their grief, looking for similarities and differences in grief expression across cultures. Artists Marc Chagall (1887-1985), Frida Kahlo (1907-1954), and Motoi Yamamoto (1966) each experienced the significant loss of a loved one. I composed three case studies to analyze each artist's visual expression of grief within their various cultural contexts. Marc Chagall's grief over the loss of Bella reflected his love for his Jewish culture, a longing for the Jewish community of Vitebsk, and a hope for his and Bella's future reunion in an afterlife. Frida Kahlo utilized bloody Aztec imagery, the personification of death, and the colorful expressions of the Mexican Day of the Dead festival to illustrate her physical and emotional pain. Contemporary artist Motoi Yamamoto makes salt installations in a meditative process that reflects his grief within the framework of his Japanese Buddhist culture. Each artist expressed their grief in a way that was congruent with their cultural understanding of death and their society's conventions for the expression of grief. Even my own body of work, which I will display alongside of my research, interpreted my father's death from a distinctly American Protestant angle.

Although the experience of loss is universal, how a society conceives of death inevitably influences its manner of expression. Since art is just one facet of cultural expression, there are likewise many variations in how death is portrayed and expressed through the visual arts. Art provides a visual manifestation of grief within a cultural framework. A cross-cultural understanding of grief art can connect us to what is essentially human about the experience of loss.

Presentation Number P-15

ABSTRACT:

Abstract Title:	**Cash Cropping in Guatemala Positively Correlated with Chronic Malnutrition in Indigenous Mayan Population**			
Presenter:	Julia Spaude			
Mentor:	Marian Sciachitano			**Honors** No
Authors:	Julia Spaude			
Presentation Type:	Poster	**College and Major:**	Arts and Sciences: Social Sciences	
Category:	Social Sciences			

The socio-economic situation in Guatemala today is severe, approximately 75% of the entire population lives under the poverty line, with a 90% majority of the indigenous Mayan population living below the extreme poverty line. This research looks at trends in the privatization of land in Guatemala for use in cultivating cash crops for export, to rates of poverty and malnutrition within the indigenous Mayan population. To determine this, the study examines the relationship between the proportion of land allocated to produce subsistence crops (such as maize, beans, & rice) to cash crops (like coffee, sugar, & cacao). The data is then compared with the corresponding proportion of food imports to Guatemala, in order to determine the effect these variables have on the market prices of food in the region, and thus on rates of malnourishment. Primary statistical data for this study has been drawn from the World Bank, International Monetary Fund, U.S. Agency for International Development, UNICEF, National Statistics Institute, & United Nations Development Programme. This research has found that rates of malnourishment are particularly concentrated among the rural agricultural class, and that this trend is positively correlated with the expansion of the cash crop industry in Guatemala.

Presentation Number P-16

ABSTRACT:

Abstract Title:	**Rebuilding the Core of a Small Rural Washington Town**			
Presenter:	Catherine Weisenburger			
Mentor:	Kathleen Ryan, Bob Krikac			**Honors** No
Authors:	Catherine Weisenburger			
Presentation Type:	Poster	**College and Major:**	Agricultural, Human, and Natural Resource Sciences: Interior Design	
Category:	Arts and Design			

An underserved population in rural Washington engaged a team of WSU interior design students to re-purpose an existing building on their main street. The goal of the project was to assist in rebuilding the core of the community using this project to continue the momentum created by other recent renovations. The team used co-design theory to build consensus with a variety of stakeholders, bringing the project vision to fruition.

A diverse group in an initial meeting was successful in beginning the conversation, followed by direction from one of the key stakeholder groups in the project. The design team brought key members of the initial group back into the process, building a larger foundation of support for the project to ensure its long-term success.

Throughout the process of periodic workshops, the design team worked hand in hand with the stakeholders to create documents that would allow the broader community to visualize the building's potential. With supportive background research, the design team demonstrated solutions to improve aesthetics and support to the community in both function and finance.

A major challenge in community work is bridging the gap between groups with different viewpoints. Using the co-design process the workshop brought together diverse group perspectives, and resulted in a unified consensus about community needs and the project direction.

The design team honed their qualitative research and communication skills, facilitated discussions, presented case studies and created visual evidence. This enabled the community to further discuss the design and bring it to reality. The team members continue to work with the community, providing support in their grant applications and continuing phases of the project.

Presentation Number P-17

ABSTRACT:

Abstract Title:	**Tandem Orthogonal Proteolysis Activity-Based Protein Profiling (TOP-ABPP) – An Analytical Platform for the Identification of Probe-Labeled Proteins in *Mycobacterium Tuberculosis***			
Presenter:	Lindsey Anderson			
Mentor:	Kathleen McAteer			**Honors** No
Authors:	Anderson LN, Wiedner SD, Wright AT, Smith RD			
Presentation Type:	Poster	**College and Major:**	Arts and Sciences: General Biological Sciences	
Category:	Molecular, Cellular, and Chemical Biology			

We have developed and employed active site-directed chemical probes to identify novel ATP-binding proteins found in the human pathogen *Mycobacterium tuberculosis (Mtb)*, the causative agent of tuberculosis. ATPases play a crucial role in Mtb viability, infection, drug resistance, and pathogenesis (Ansong et al. 2013). By using Tandem Orthogonal Proteolysis Activity-Based Protein Profiling (TOP-ABPP) as an analytical platform, we can further explore the functional state of many proteins expressed within a complex biological system (Weerapana et al. 2007). General ABPP methods involve treating the proteome sample with an alkyne-containing ABPP probe and appending a biotin-tag, with specific cleavable moieties, by click chemistry. The tagged probe-labeled proteins are then enriched using biotin-streptavidin affinity. The resulting tryptic peptides are used for the subsequent identification of probe labeled proteins via mass spectrometry. However, there is a significant complication with the general method in that we are unable to identify the specific amino acid covalently labeled by the probe post tryptic digestion. In order to avoid this complication, one must either break the bond between biotin and streptavidin, which is not readily achievable, or break the bond between biotin and the probe. Here we explore two methods targeted to resolve such challenges; the first method is an adaptation of the TEV protease cleavable enrichment (Weerapana *et. al.*2010). In this approach, following sample labeling with a probe containing an alkyne, click chemistry cycloaddition is used to introduce a biotin tag that incorporates a TEV protease cleavage site. Following avidin enrichment of probe-labeled proteins, the TEV protease is used to cleave the ABP-labeled peptide from the avidin resin for MS analysis. Our second method utilizes photocleavable biotin (PC-biotin) which incorporates a photocleavable moiety via click chemistry onto our probe labeled proteins in our sample. Following avidin enrichment, UV illumination is used to cleave the ABP-labeled peptides from the avidin resin for MS analysis. Although we are still working to improve both methods, in these initial cleavable efforts we have found significantly better results using the TEV approach. Exploring TOP-ABPP cleavable methods, although challenging, will help to identify and further functionally annotate characteristics of key enzymes involved in complex eukaryotic and prokaryotic proteomes.

Presentation Number P-18

ABSTRACT:

Abstract Title:	**Registering in Situ Airway Cast to Lung Volume using Maya**		
Presenter:	Sean Colby		
Mentor:	Dr. James Carson (not faculty--he is a PNNL researcher)		**Honors** Yes
Authors:	Sean M. Colby, Richard E. Jacob, Senthil Kabilan, Daniel R. Einstein, James P. Carson		
Presentation Type:	Poster	**College and Major:**	Engineering and Architecture: Bioengineering
Category:	Computer Science, Mathematics, Statistics, and Information Sciences		

The use of detailed animal-specific airways is important for more accurate modeling of respiratory systems. One approach for acquiring detailed airway structures in the lung is to create a cast of the lung with high contrast materials, which is subsequently imaged. However, some deformation in the airway branching angles can take place during casting, even when casting is performed in situ. We have developed an approach for interactively adjusting the branching angles of a segmented airway cast to match those of the airways in the live animal. The key components of the approach are a skeletonization of the airway that generates secondary nodes of rotation as well as the use of dual quaternions for skinning the moving geometry surface. We used Autodesk® Maya® 3D animation software to interact with the skeleton and to perform skinning. This technique achieves cast-level detail true to the form of live airways. Eventually, this work will be applied to achieve cast-level detail at each point during a breathing cycle, resulting in a time-varying 3D model of the lung airways for use in a computational fluid dynamics (CFD) model.

Presentation Number P-19

ABSTRACT:

Abstract Title:	**Crystallization and Characterization of Caffeoyl CoA O-methyltransferase in Sorghum bicolor**		
Presenter:	Samuel Byrd		
Mentor:	ChulHee Kang		**Honors** Yes
Authors:	Samuel Byrd, Kevin Lewis, ChulHee Kang		
Presentation Type:	Poster	**College and Major:**	Engineering and Architecture: Bioengineering
Category:	Molecular, Cellular, and Chemical Biology		

One of the significant hindrances to a viable biofuel alternative to fossil fuels is the cellular content of lignin. While lignin is critically importance to plant cell water permeability, structural integrity, and defense against microbial or fungal assault, the energy intensive removal of lignin from biomass during biofuel synthesis hinders biofuel production and decreases its economic feasibility. One plant important in biofuel production is *Sorghum bicolor,* but its use in biofuel production is hampered by its high lignin content. The enzymes of the lignin biosynthesis pathway of *S. bicolor* have been identified, and using biophysical/biochemical techniques, a way may be found to bioengineer *S. bicolor* to lower its cellular lignin content while preserving the important cellular roles of lignin. One of the enzymes involved in the lignin biosynthetic pathway, Caffeoyl CoA O-methyltransferase (SbCoA-OMT), is a potential target for bioengineering *S. bicolor* lignin biosynthesis, and through X-ray crystallographic structural studies and biophysical characterization, possible modifications to SbCoA-OMT may be found which will increase the economic viability of using *S. bicolor* in biofuel production.

Presentation Number P-20

ABSTRACT:

Abstract Title:	**CO2 eddy covariance flux measurements at four agricultural sites under different crop management practices in the Pacific Northwest**		
Presenter:	Heather Baxter		
Mentor:	Shelley Pressley		**Honors** No
Authors:	Heather Baxter, Jackie Chi, Laurel Graves, Sarah Waldo, Patrick O'Keeffe, Shelley Pressley, and Brian Lamb		
Presentation Type:	Poster	**College and Major:**	Engineering and Architecture: Civil Engineering--Water Resources
Category:	Engineering and Physical Sciences		

The Regional Approach to Climate Change (REACCH) USDA program is focused on the sustainability of cereal cropping systems in the Pacific Northwest. One component of the program is the direct measurement of CO_2 fluxes at different locations and for different crop management practices to assess the potential for C sequestration in the face of ongoing climate change. In this paper, we present results of initial CO_2 Net Ecosystem Exchange (NEE) flux measurements using eddy covariance methods at four different locations within the inland Northwest. The first two sites are a pair of nearby fields with annual wheat cropping systems using conventional till and no till management, respectively. The third site is in a higher rainfall zone with an annual wheat cropping system using conventional till management, and the fourth site is in a lower rainfall zone with a wheat/summer fallow rotation using conventional till management. The objective of this paper is to assess the similarities and differences in NEE for these four sites and to consider the NEE with respect to local climate variability amongst the different sites, seasonal differences and management practices.

Presentation Number P-21

ABSTRACT:

Abstract Title:	**Anti-Obesity and Aversion to Sugar Observed After Selective Vagotomy in Rats**			
Presenter:	Lindsey Ballsmider and Casey Callahan			
Mentor:	Krzysztof Czaja			**Honors** No
Authors:	Casey Callahan, Lindsay Ballsmider, Krzysztof Czaja D.V.M., Ph.D			
Presentation Type:	Poster	**College and Major:**	Arts and Sciences: Psychology Veterinary Medicine: Neuroscience	
Category:	Organismal, Population, Ecological, and Evolutionary Biology			

Different gastric bypass surgeries (GB) have been shown to lower caloric intake and body mass. They are currently the only effective methods to defeat obesity epidemic. During GB the dorsal and the ventral gastric branches of the vagus nerve are transected. Therefore, we hypothesized that this selective vagotomy may be a major factor in reducing caloric intake. To do this, rats were subjected to a schedule of 23-h ad libitum food and water and 30 min./day test solution. The test solution used was 15% sucrose in tap water. The body weight, 23-h food intake and 30 min. test solution intake were monitored daily. The rats were randomly divided into two groups; one group underwent selective gastric vagotomy (VAG) and the other group, sham vagotomy (SHAM). In the VAG rats the ventral and dorsal gastric vagi were transected. In the SHAM rats surgical procedures were the same as for vagotomy except the section of the vagi, which were left intact. Following the vagotomy animals were subjected to test schedules as before. The test solutions were given in a randomized order as a two bottle test. At the end of the study, the animals were sacrificed, fat tissue collected and weighed and completeness of vagotomy was verified. Results of the study revealed significant decrease of the sucrose intake after selective vagotomy in both the recovery week and the week later. Selective vagotomy also significantly decreased weight gain, fat and daily caloric intake in both the recovery week and the week later. Our results show that damage to dorsal and ventral gastric branches of the vagal trunks play a major role in the anti-obesity effect of GB.

Presentation Number P-22

ABSTRACT:

Abstract Title:	**"China-Crazy": Boeing's Influence Over Washington State Delegates In The United States Congress Concerning U.S Foreign Policy Towards China, 1995-1996**			
Presenter:	Nikki Brueggeman			
Mentor:	Dr. Lydia Gerber			**Honors** No
Authors:	Nikki Brueggeman			
Presentation Type:	Poster	**College and Major:**	Arts and Sciences: History / Asian Studies	
Category:	Humanities			

This study examines how American corporatism influences the legislative branch of the United States government. To focus on this relationship between corporatism and politics, I use the Boeing Company's quest for dominance in the Chinese market from 1995 to 1996 as a case study. This project questions how a corporation uses its regional influences to put legislative voting pressure on delegates to the United States Congress concerning trade policy with China.

The rapid expansion of the Chinese market in the early to mid-1990s offered many opportunities to American corporations, prompting them to become strong advocates of free trade with China. However, the future of American business in China was threatened by political tensions that could result in high taxes on Chinese exports to the United States. China threatened to stop their contracts with American companies if sanctions were placed on their goods. American corporations and Congressional supporters of free trade policy with China argued that those sanctions would harm the ability of the United States to help China develop into a democratic nation. In this study, I argue that Boeing used its role as a large economic power and staple employer in western Washington to influence the Washington state cohort in the 104th Congress to support free trade with China.

Because of this corporate relationship with Congressional delegates, I also argue that foreign powers can have an indirect influence on the American legislative branch through corporate lobbying. This project is significant because it agrees with author James Mann's argument of the "Soothing Scenario," which states the United States insists that China's rapidly changing economy will transform it into a democracy. This project also shows China's ability to resist these political pressures through its relationships with American corporations and economic means.

Presentation Number P-23

ABSTRACT:

Abstract Title:	**Positional and Functional Annotation of the Mycobacteriophage Serenity Genome**		
Presenter:	Tyler Caskin		
Mentor:	Dr. Julie Stanton		**Honors** No
Authors:	Nikhil Babu, Christina Beckwith, Kara Beseler, Amanda Brison, Joseph Carone, Tyler Caskin, Molly Diamond, Kenzie Durham, Janey Foxe, Mitchell Go, Bryce Henderson, Isabel Jones, Jessica McGettigan, Matthew Nasrallah, Danny Ortiz, Carly Piller, Sara Privatt, Sydney Schneider, Shaylen Sharp, Tessa Smith, Hannah Ullery, Russell Wilson		
Presentation Type:	Poster	**College and Major:**	Arts and Sciences: Zoology
Category:	Molecular, Cellular, and Chemical Biology		

] Mycobacteriophages are viruses that infect bacterial host cells such as Mycobacterium smegmatis. These viruses are worthy of scientific research because some mycobacteria cause diseases such as tuberculosis and leprosy in humans. Scientists hope to be able to use these mycobacteriophages in order to treat people affected by these diseases. The objective of this undergraduate study, part of the Howard Hughes Medical Institute Science Education Alliance lab, was to annotate the genome of a recently isolated and sequenced mycobacteriophage Serenity. Serenity was isolated from a soil sample collected in Pullman, and is a Siphoviridae mycobacteriophage with a non-contractile tail. This means that Serenity has a double-stranded DNA genome and contains a tail that cannot condense in size. Annotation is the process of reviewing each gene to determine the start and stop sites of each gene, as well as any potential function the gene may have. During annotation, each possible gene was carefully examined and changed if needed, using programs such as DNA Master and Phamerator. DNA Master is a program that allows researchers to view where potential genes start and stop, while Phamerator is used to compare the locations of genes within different genomes. It was discovered that Serenity's genome is 52088 base pairs long with defined physical ends. It is also comprised of 62.6% guanine and cytosine nucleotides. In order to determine any potential function the genes may have, the amino acid sequence of the genes were processed through programs such as BlastP, Conserved Domain Database, and HHPRed. These programs compared the possible proteins of the genome, with proteins from other genomes.. Using the information gathered in this study, the goal is to learn about the similarities Serenity shares with other mycobacteriophages in the same cluster, as well as any differences that may have arisen as Serenity evolved.

Presentation Number P-24

ABSTRACT:

Abstract Title:	**Development of Targeted Therapeutics for Prostate Cancer**			
Presenter:	Matthew Galliher			
Mentor:	Cliff Berkman			**Honors** No
Authors:	Matthew Galliher, Melody Fulton, Dr. Cliff Berkman			
Presentation Type:	Poster	**College and Major:**	Veterinary Medicine: Biochemistry-Biophysics	
Category:	Engineering and Physical Sciences			

The protein Prostate-Specific Membrane Antigen (PSMA) has been described as an 'ideal biomarker' for prostate cancer because its presence on cell surfaces is restricted mainly to prostate tumor cells. PSMA expression increases on late-stage, androgen-independent, and metastatic prostate cancer cells. PSMA also decorates cells lining new blood vessels of a variety of other types of tumors such as breast, colon, lung, and ovarian, which has raised the prospect of its use as a biomarker for highly-vascularized tumors. The Berkman lab at WSU is the first and only lab to develop a unique class of molecules that selectively bind to PSMA and penetrate prostate cancer cells. Now these inhibitors are being pursued as homing agents for the selective delivery of therapeutics agents into prostate tumors cells. To this end, we have designed a hybrid molecule that combines both a PSMA homing agent with a cytotoxic drug molecule for the selective treatment of prostate tumor cells. The cytotoxic drugs selected for these 1st-generation PSMA-targeted drug conjugates are the chemotherapeutic agents doxorubicin and paclitaxel which have been shown to be effective in the treatment of prostate, breast, and ovarian cancers. It is expected that such PSMA-targeted drug conjugates will exhibit high selectivity for prostate tumor cells and spare normal cells from the common side effects of chemotherapy. This presentation will highlight our progress in the development of our 1st-generation PSMA-targeted therapeutic platform. The effectiveness of these agents will be assessed for PSMA binding, extent of drug release, and cytotoxicity toward target cells.

Presentation Number P-25

ABSTRACT:

Abstract Title:	**The Sleeping Venus**		
Presenter:	Kendra Alexson		
Mentor:	Maria Deprano		**Honors** No
Authors:	Jaynie Anderson, Phyllis Bober, David Brown, Jill Burke, Robert Lenardon, Jacqueline Musacchio, John Paoletti, Terisio Pignatti, Mary Rogers, and Paola Tinagli		
Presentation Type:	Poster	**College and Major:**	Arts and Sciences: Art History
Category:	Arts and Design		

My research focuses on the possible influences Giorgione might have had when painting the Sleeping Venus during the Renaissance. The subject matter of the sleeping nude, in a painting, had not really been seen before Giorgione. So, the possible influences are somewhat of a mystery. Yet, we know from x-rays that at the base of the female nude there is a small cupid that was painted over, identifying the woman as Venus. This subject matter is more sensible since there were many marriage poems, known as epithalamia, which featured Venus. These epithalamia talked of Venus being awoken by Cupid to attend a marriage as a pronuba, or patroness of marriage. Along with this, there was a great interest in poesia, or paintings that were meant to represent poetry, during the Renaissance.

Yet, there is still the question of what imagery Giorgione was looking at for inspiration. From my research there is a possibility that imagery of the sleeping nude was common on cassoni, or marriage chests. The marriage chests were given to brides as a betrothal present and the painted images on the inside were to inspire copulation. It is thought that these images eventually moved from the cassoni to the wall. Therefore, Giorgione's piece could have very well been one of the first to make this move.

Presentation Number P-26

ABSTRACT:

Abstract Title:	**Role of MqsR toxin during biofilm formation in Yersinia pestis**		
Presenter:	Savanna Castillo		
Mentor:	Viveka Vadyvaloo		**Honors** No
Authors:	Savanna Castillo, Viveka Vadyvaoo		
Presentation Type:	Poster	**College and Major:**	Veterinary Medicine: Microbiology
Category:	Molecular, Cellular, and Chemical Biology		

Yersinia pestis is a Gram-negative bacterium responsible for the bubonic plague. The rat flea is the primary carrier of this pathogen and becomes infected after taking a blood meal from an infected animal. Once infected, the bacteria reproduce, forming a biofilm in the foregut of the flea causing a blockage. A biofilm consists of densely packed microbial cells and is found in many different types of bacteria. When the flea attempts to take a blood meal from a human, the blood is not allowed to enter due to the blockage and is regurgitated back into the human's blood stream along with the bacteria, causing infection.

MqsR and MqsA is a toxin-antitoxin module. MqsR is the toxin portion of the module and MqsA is the antitoxin. These toxin-antitoxin molecules are up-regulated when *Y. pestis* attempts to adapt to the harsh environments of the flea gut. In this study, the role of the toxin and antitoxin are being examined in biofilm formation *in vitro.* The *mqsR* and *mqsA* genes were cloned separately and fused with a tag sequence called FLAG that is used as a recognition sequence. The plasmid vector that contains the genes is expressed by a promoter that is induced with the chemical hydrochloride. An immunoblot is an analytical technique that is used to detect a specific protein. Expression of both MqsR and MqsA was confirmed by immunoblot analysis. Induction of the *mqsR* toxin gene did not affect biofilm formation *in vitro* on polystyrene plates, indicating that this toxin has no role in biofilm formation.

Presentation Number P-27

ABSTRACT:

Abstract Title:	**Student Confidence in Faculty Candidates**		
Presenters:	Sebastian Armstrong, Michael Johnson, and Scott Onken		
Mentor:	Dr. Lawrence D. Bruya		**Honors** No
Authors:	Sebastian Armstrong, Michael Johnson, and Scott Onken		
Presentation Type:	Poster	**College and Major:**	Education: Athletic Training Education: Kinesiology University College: Pre-Health
Category:	Social Sciences		

The purpose of this study was to determine differences in student confidence levels between candidates regarding the ability to meet the demands of the position.

H#1: Students will not demonstrate preference in candidates.
NH#2: There will be no difference between males and females students on confidence in candidates.

A Student Confidence Questionnaire measured the confidence of male and female students in the candidates. Candidate presented to students.

Descriptive statistics were used to demonstrate candidate preferences. Means indicated that Candidate #1 (C#1; μ=3.706) was followed by Candidate #3 (C#3; μ=3.625) and Candidate #2 (C#2; μ=3.036) in student preference. Hypothesis #1 was rejected.

For C#1, the average for male students was 3.713 and 3.699 for females. The P-value on a t-test for C#1 was 0.893. Hypothesis #2 for C#1was accepted. For female candidates, gender differences were found. There was a significant difference between male and female student confidence for female candidates. Male students were less confident in female candidates than were female students. For C#2, the male average was 2.846 versus 3.121 for females. The P-value for C#2 was 0.055. For C#3, males averaged 3.439 while females averaged 3.794. The P-value for C#3 was 0.028.

Discussion. Male students were less confidence in female candidates. Apparent gender bias may have been conscious or unconscious. In either case, gender training might be a good idea prior to consideration of new positions with mixed gender candidates. Students were more acceptant of C#1 and C#3. Students recommended C#1 and C#3 in that order, but did not recommend C#2 to the Search Committee. C#1 was a sport scientist with a background in Exercise Physiology and Biomechanics. C#2 and C#3 were both sport psychologists with backgrounds in the social sciences. Therefore, selection to appointment to position suggests implications for program.

An offered position appointment to C#1 would indicate adherence to a traditional view of the scientific basis for the kinesiology profession. An offered position to C#2 or C#3, may indicate a move away from the traditional science base consisting of Exercise Physiology and Biomechanics, to a base of social science.

Presentation Number P-28

ABSTRACT:

Abstract Title:	**DNA Origami: An analysis of the DNAjig program for design of DNA nanostructures**		
Presenter:	Ryan Christian		
Mentor:	Amit Dhingra		**Honors** Yes
Authors:	Ryan Christian, Amit Dhingra, Ananth Kalyanaraman		
Presentation Type:	Poster	**College and Major:**	AGRICULTURAL, HUMAN, AND NATURAL RESOURCE SCIENCES: Agricultural Biotechnology
Category:	Molecular, Cellular, and Chemical Biology		

DNA origami is a novel technique in the field of nanotechnology that utilizes the complementary base-pairing nature of DNA to form self-folding nanostructures of desired form. Unlike other forms of bottom-up assembly methods for nanostructures, DNA origami promises a high level of structural complexity and predictability that could be developed for use in medicine, robotics, and electronics. In the fabrication process, ssDNA is anchored via short single-stranded primers to molecularly staple the DNA into any desired form. The technology has incredible potential for future growth, but a lack of research into efficient programming models has stunted its development, restricting syntheses to relatively simple 2D structures. In 2009, a paper published by Haque et al. featured DNAjig, a newly-designed program to optimize folding path and primer design to easily create DNA scaffold designs. DNAjig utilized gel electrophoresis evidence of secondary structure formation as validation of the program's success, but visual evidence is necessary to confirm proper folding of the nanostructures. In this presentation, electron microscopy is used to visually evaluate the efficacy of four different structures designed by DNAjig: a series of one to four linked squares in a 1x1, 1x2, 1x2x1, and 2x2 pattern. Furthermore, isolation of the chosen template path from the larger ssDNA molecule was not established, instead allowing unutilized ssDNA "tails" to remain associated with folded DNA: a liability for precise nanotechnology applications. In this analysis of the DNAjig program, electron microscopy evidence is examined to assess the efficacy of the program's template path optimization and primer design features. Furthermore, two methods are examined in the preparation of appropriate-length ssDNA for subsequent folding. First, enzymatic digestion of primer-annealed ssDNA followed by gel purification was utilized to generate the appropriate region. Next, a novel method utilizing PCR with a biotinylated primer was used to amplify and pull out the region. Both of these methods are presented as possible solutions to the problem that unutilized ssDNA poses for proper self-assembly.

Presentation Number P-29

ABSTRACT:

Abstract Title:	**Study of Fuel Cells for Efficient Integration into Power Systems**		
Presenter:	Patrick Gavin		
Mentor:	Ali Mehrizi-Sani		**Honors** Yes
Authors:	Patrick Gavin, Justin Bahrami		
Presentation Type:	Poster	**College and Major:**	Engineering and Architecture: Electrical Engineering
Category:	Engineering and Physical Sciences		

Proton exchange membrane (PEM) fuel cells, which produce electricity by combining hydrogen and oxygen, have numerous applications supplying power in auxiliary roles for both systems connected to the electrical grids and isolated systems. PEM fuel cells have certain benefits over alternative microgeneration systems such as reduced mechanical complexity, low operating temperatures, and efficiencies near 50% (compared with approximately 25% for an internal combustion engine). Efficient utilization of fuel cell stacks in power systems requires an accurate dynamic model describing their operation. In order to develop and validate such a model, a fuel cell test stand capable of measuring voltage, current, hydrogen flow rate, pressure, humidity, and temperature under transient and steady state conditions has been created. The data gathered so far shows stack power is directly proportional to the differential anode pressure and the long time scale transient response can be modeled by a second-order differential equation. As an example implementation in an islanded system, the fuel cell being tested is being integrated into an unmanned aerial vehicle (UAV) power system.

Presentation Number P-30

ABSTRACT:

Abstract Title:	**Non-Classical Progesterone Signaling in Uterine Physiology**			
Presenter:	Nicole Clark			
Mentor:	Dr. James Pru			**Honors** No
Authors:	Nicole Clark, Melissa McCallum, Cindy Pru, James Pru			
Presentation Type:	Poster	**College and Major:**	Veterinary Medicine: Biochemistry (Molecular Biology emphasis)/ Genetics and Cell Biology	
Category:	Molecular, Cellular, and Chemical Biology			

Progesterone (P4) is a sex steroid hormone that is essential for female fertility. Disruption of P4 signaling can lead to women's reproductive disorders like infertility, cancer, and endometriosis. Progesterone exerts its effects by activating the classical progesterone receptor (PGR). However, studies with *Pgr* null mice clearly demonstrate that not all of the actions of P4 are mediated by PGR, since *Pgr* null mice still respond to P4. Progesterone receptor membrane component (PGRMC) 1 and PGRMC2 are novel progesterone receptors that are thought to promote survival of uterine, ovarian, and breast cells. In our studies, we have shown that PGRMC1 and PGRMC2 are expressed in the ovary and uterus of pregnant rodents. We have also generated transgenic mouse lines in which *Pgrmc1*, *Pgrmc2*, or both genes have been deleted from the female mouse reproductive tract through conditional mutagenesis. We are using these mouse models to establish a functional role for non-classical progesterone signaling in female reproduction. Specifically, we have used these mouse lines in breeding trials and for histological analyses. Preliminary results from the breeding trial indicate that *Pgrmc1* and *Pgrmc2* conditional knockouts display a subfertility phenotype in which knockout mothers produce fewer pups per litter than control (*Pgrmc1*- and *Pgrmc2*-intact) mothers do. Our initial histological analysis of the ovary and uterus suggest that PGRMC1 deficiency results in increased ovarian follicle atresia and increased development of endometrial cystic hyperplasia. This uterine phenotype is accelerated in *Pgrmc1/Pgrmc2* double conditional knockout mice. The uterine disease state may be responsible for the subfertility phenotype. Future research will involve examination of the mechanism of action of PGRMC1 and PGRMC2; specifically, we hope to delineate the pathways by which PGRMC1/2 mediate P4 signals in order to exert biological change. Understanding the mechanistic roles of PGRMC1/2 in uterine function will enable future development of therapeutic strategies that target these receptors in order to control fertility and treat women's diseases like endometriosis and uterine cancer.

Presentation Number P-31

ABSTRACT:

Abstract Title:	**Establishment of Biotechnological Tools and Strategies for Long-Term Improvement of European Pear**			
Presenter:	Pablo Corredor			
Mentor:	Amit Dhingra			**Honors** No
Authors:	Pablo Corredor,Christopher Hendrickson, Nathan Tarlyn, Amit Dhingra			
Presentation Type:	Poster	**College and Major:**	AGRICULTURAL, HUMAN, AND NATURAL RESOURCE SCIENCES: Food Science / Business	
Category:	Molecular, Cellular, and Chemical Biology			

The pear industry faces challenges to its long-term growth and stability. While newer varieties may enhance domestic markets, a narrow genetic pool limits the options available to address current challenges. Deployment of micropropagation and transformation techniques to current and novel pear germplasm can provide a toolset to rapidly reduce the time required to improve existing varieties. Production of pear plants requires a set of procedures for the introduction of improved genetic material. In order to produce stable genetically transformed plants, a selection mechanism must be utilized to isolate transgenic plants. Typically, engineered resistance to an antibiotic is used as a selection. Geneticin (G418) is an antibiotic that is expected to be an ideal selection agent due to its stability in a tissue culture environment. In order to determine the efficacy and optimal concentration of G418, the antibiotic was added in a graded concentration series, to an optimized pear medium (TDH medium). Bartlett leaves were placed on TDH medium and incubated for 6 weeks in dark, with 0, 25, 50, or 100 mg/L G418. Callusing was significantly inhibited by G418 at all concentrations, with growth only on control leaves (ANOVA, $P<0.05$). Overall, the kill curve experiment showed that the concentrations of G418 were too high to serve as at suitable selection agent. Since kanamycin, and similar antibiotics have been shown to be effective in pear selection during transformation, future transformation efforts will test lower G418 levels. Additionally, optimal nutrient concentrations in plant growth media generally improve the growth and vigor of explants. Bartlett stem explants were placed in traditional Quorin and Lepoivre or TDH media and incubated for 6 weeks to allow shoot induction. Dry weight of new growth was measured after 24 hours of desiccation. Nutrient content of the dried tissue was then assessed. Results indicated that in TDH media-grown plants. Finally, to produce viable plants from tissue culture one must induce rooting. To determine a root induction protocol, a trial was conducted comparing cultural conditions. Rockwool was tested as a potential rooting substrate due to expected speed in rooting of plants. In this experiment, mean rooting response was determined among all explants. Both the liquid TDH and solidified 1/2-strength TDH medium contained 3.0 mg/L indolebutyric acid. Cultures were exposed to a dark period of one week for induction of root tissue, then transferred to low light to allow for further growth. The ½ TDH medium combined with dark treatment had a significant positive effect on rooting ($P<0.05$, *t*-test) compared to Rockwool. This project demonstrated effects of new tools for future development of long-term improvement of pear varieties. Due to knowledge gained in this work, efficiency of future transformation and propagation efforts in European pear will be enhanced.

Presentation Number P-32

ABSTRACT:

Abstract Title:	**The Transport of Escherichia coli through Biochar Amended Soil**			
Presenter:	Trent Graham			
Mentor:	Nehal Abu-Lail			**Honors** No
Authors:	Waled Suliman, Trent Graham, Nehal Abu-Lail			
Presentation Type:	Poster	**College and Major:**	Engineering and Architecture: Biological Engineering	
Category:	Engineering and Physical Sciences			

Bacteria are ubiquitous in soil. Many form symbiotic relationships with plants and animals, while others are virulent pathogens. The presence of pathogenic bacteria in the subsurface can contaminate drinking water and agricultural produce, frequently resulting in outbreaks of food-borne illness. Previously, we have quantified the collision efficiencies of eight food-borne *Listeria monocytogenes* strains with known levels of virulence by their ability to transport through soil. Collision efficiency is the probability that a bacterium collides and is retained compared to the total number of bacteria that collide against the surface. We will use the same approach to study the effects of mixing soils with oxidized biochar to attenuate the transport of pathogenic and non-virulent strains of *Escherichia coli*. Soil amendment with oxidized biochar has been shown to improve soil fertility and reduce the emission of greenhouse gases from fertilizer. The porous structure of oxidized biochar may also reduce the transport of *E. coli* and mitigate the advective migration of pathogens. To quantify the adhesion and transport of *E. coli* in saturated sand, kinetic profiles of the transport were determined at room temperature. The adsorption kinetics of bacteria in composite soil were measured by comparing the concentration of bacteria leaving the soil matrix at a given flow rate to the known influx of bacteria. One dimensional filtration theory was applied to quantify the collision efficiency and correlate the concentration of oxidized biochar in the experimental column to the reduction in transport.

Presentation Number P-33

ABSTRACT:

Abstract Title:	**Effectiveness of the 6-OHDA Animal Model of Parkinson's Disease**		
Presenter:	Michelle David		
Mentor:	Krzysztof Czaja		**Honors** Yes
Authors:	Dr. Joseph W. Harding, Dr. John W. Wright, Dr. Krzysztof Cazja, Michelle R. David, Daniel P. Sondheim, Leen H. Kawas		
Presentation Type:	Poster	**College and Major:**	Veterinary Medicine: Neuroscience
Category:	Molecular, Cellular, and Chemical Biology		

Parkinson's disease is a motor system disorder that affects four to six million people around the world, with 60,000 new cases in the United States every year. Currently, there is no cure. The goal of this research is to evaluate the 6-OHDA animal model of Parkinson's disease in order to study potential therapeutics that are being developed and evaluated in this lab.

6-OHDA is a neurotoxin that selectively destroys dopaminergic and noradrenergic neurons in the brain. In this study, three microliters of 6-OHDA are injected unilaterally into the substantia nigra (SN) over a three minute time span. Two injections are made using the bregma coordinates AP -4.8/ ML +1.8 and AP-5.2/ ML +2.5. Motor functions are evaluated prior to surgery and at 7, 14, 21, and up to 48 days post-surgery to measure the deficit caused by 6-OHDA-induced lesions of the SN. Amphetamine-induced ipsiversive rotational behavior, step/gate analysis, and hemp rope and slant screen hang tests are the usual behavioral tests to evaluate motor dysfunctions. In this study step/gate analysis and rope hang times are evaluated. The animals are sacrificed three months after injection, and then tyrosine hydroxylase (TH) staining is used to visualize degeneration in the SN. TH staining is evaluated for left vs. right hemisphere in the same animal, and for the 6-OHDA injected animals vs. the sham animals.

Our results show a significant difference between the injected hemisphere and the intact hemisphere in the same animal. The 6-OHDA injection kills a significant number of dopaminergic neurons. Use of 6-OHDA provides a reliable animal model of Parkinson's disease. Our model can be used to evaluate drugs that could potentially regenerate and protect neurons in patients with Parkinson's disease.

Presentation Number P-34

ABSTRACT:

Abstract Title:	**Do Parasites Make You Hungry or Slow? Parasite-Induced Change to Consumption andi Ecological and Evolutionary Implications**			
Presenter:	Zachary Colburn			
Mentor:	Dr. Mark Dybdahl			**Honors** No
Authors:	Zachary Colburn, Dr. Emily Jones, Dr. Mark Dybdahl			
Presentation Type:	Poster	**College and Major:**	Arts and Sciences: Ecology and Evolutionary Biology / Veterinary Medicine: Biochemistry	
Category:	Organismal, Population, Ecological, and Evolutionary Biology			

Direct effects of parasites on their hosts have important ecological and evolutionary consequences, including the virulence of infection. However, parasites can potentially have indirect effects on their hosts, which should alter host ecology and evolution. For example, infection by parasites can alter consumption rate of individual hosts and consequently change the amount of resources available to the host population. When infected individuals consume less than susceptible individuals (hypophagia), there is a relative increase in resource availability. Conversely, when infected individuals consume more than susceptible individuals (hyperphagia), there is a relative decrease in resource availability. Changing resource availability affects the intensity of intraspecific competition, which has both ecological and evolutionary consequences.

To determine the ecological and evolutionary consequences of hypophagia and hyperphagia, I conducted an empirical and a theoretical study. First, I created a mathematical model using the adaptive dynamics approach and compared infection prevalence, host defense, parasite exploitation, and virulence (the damage of parasitism) at the evolutionary equilibrium. Analysis showed that evolutionary outcomes and the prevalence of infection were dependent on the parasite-induced change to consumption, but virulence was not.

Based on the theoretical results I predicted that infection should change an individual's competitive effect. To test my prediction, I first compared the behaviors of susceptible and infected California horn snails (*Cerithidea californica*) in order to determine whether infection induced hypophagia, no consumption change, or hyperphagia. These snails graze on algal films as they move over the substrate, so their consumption rate is proportional to their velocity. I found that infected individuals had a decreased velocity compared to susceptibles ($P = 0.007$), indicating hypophagia. I then compared the maximum distance from the origin infected and susceptible individuals moved in order to determine how infection affected individual competitive effect. I found that infected individuals had moved a shorter maximum distance from the origin compared to susceptibles ($P = 0.01$), indicating reduced competitive effect.

These results suggest that it may be important to consider parasite-induced changes to consumption when attempting to understand the ecological and evolutionary relationships between hosts and parasites.

Presentation Number P-35

ABSTRACT:

Abstract Title:	**Rwandan Agricultural Innovations**			
Presenter:	Victoria Barth and Taya Brown			
Mentor:	Dr. Kim Kidwell and Ms. Colleen Taugher			**Honors** No Yes
Authors:	Victoria Barth, Taya Brown, Charles Christianson and Colleen Taugher			
Presentation Type:	Poster	**College and Major:**	Agricultural, Human, and Natural Resource Sciences: Field Crop Management / Communication Agricultural, Human, and Natural Resource Sciences: AFS - Organic Agriculture / CLA, Biology-Botany	
Category:	Applied Sciences			

Overview: Over spring and summer of 2012, 5 WSU Agriculture students showed leadership in a unique agricultural development project in Rwanda. The mentors and creators of this internship were Ms. Colleen Taugher and Dr. Kim Kidwell. The team was given the challenge of solving agricultural problems identified by local people in Gashora. Goals outlined for the internship were to create culturally compatible agricultural innovations to meet the needs as specified by the people of Gashora: food preservation, health and sanitation, soil management/nutrition, and income. To address the proposed challenges, each student applied knowledge from their respective fields of study, while also using the Internet to work collaboratively with Rwandan peers from The Higher Institute of Agriculture and Animal Husbandry (ISAE) in Musanze. The students conducted research and built prototypes to achieve their specific project goals. In May of 2012, the team traveled to Rwanda to implement their design innovations. These included: a mushroom production facility (cash crop), passive-air solar dehydrator (food preservation), composting toilet (health and sanitation), and two types of composting systems (soil nutrient management). These projects were successfully completed in collaboration with the ISAE interns. Preliminary assesment data shows that the projects continue to be successful and benefit the Gashora community. The dehydrator is now being used to dry mushrooms and pineapples to sell to local villagers. The community has also adapted the dehydrator design to be made with readily availble and inexpensive materials to make two other functioning dehydrators based upon our model, making food security more viable for those in Gashora. The mushroom hut has been successful as well, as local people learn to manage it for production. The community also constantly uses the composting toilet, and in January of 2013, resulting high-nutrient compost applications were found to increase crop yield. Much was gained through this experience; interns learned skills of communication, critical thinking, problem solving, and motivation while bringing WSU-gained knowledge to this Rwandan community in a life transforming way. Our goals were met and the community of Gashora now has secure food, more knowledge, healthier soils and more income.

Presentation Number P-36

ABSTRACT:

Abstract Title:	**Locating the Actin Binding Site on Tropomodulin**			
Presenter:	Christian Diaz			
Mentor:	Alla Kostyukova			**Honors** No
Authors:	Mert Colpan, Christian Diaz, Alla Kostyukova, Natalia Moroz			
Presentation Type:	Poster	**College and Major:**	Engineering and Architecture: Bioengineering	
Category:	Molecular, Cellular, and Chemical Biology			

Actin is a protein that forms long repeating chains to aid in muscle contraction. Tropomodulin (Tmod) acts to halt and cap the slow-growing pointed ends of actin filaments. The structure of Tmod consists of a flexible and compact half known as the C-terminal and N-terminal domain respectively. Each half contains an area for actin to bind to, however, the exact location of the binding site on the C-terminal half is currently unknown. It has been suggested from previous work that the binding of this area of Tmod to actin involves specific interactions between acidic amino acids, or residues, of actin and basic residues of Tmod. My research was to locate these specific residues at the C-terminal end of Tmod. To do so, I diminished the interactions between actin and Tmod by using a process called point mutagenesis. In this process, I mutate the DNA that codes for Tmod so that the basic residues suspected to aid in the binding of Tmod to actin are changed to non-basic residues which shouldn't interact. The binding of these two proteins are then tested by using a procedure called pyrene-actin polymerization assay.

The results of the pyrene-actin polymerization assay showed that the mutated Tmod significantly decreased in activity regarding binding to actin. This suggests that the particular residue I mutated possibly plays an important role in actin binding. By repeating this experiment with other potential residues, I will be able to fully map out the previously unknown binding site of the C-terminal end.

Actin has been found to be involved with certain iseases such as cardiomyopathies and actin binding proteins, such as tropomodulin, are thought to be involved with the progression of these disorders. An understanding of the Tmod binding sites may be essential for discovering treatments for these diseases.

Presentation Number P-37

ABSTRACT:

Abstract Title:	**Adolescent Physical Activity Motivation**		
Presenter:	Reilly Costello		
Mentor:	Dr. Sarah Ullrich-French		**Honors** No
Authors:	Reilly Costello, Dr. Sarah Ullrich-French		
Presentation Type:	Poster	**College and Major:**	Education: Movement Studies
Category:	Social Sciences		

A need exists to motivate youths to engage in more moderate to vigorous exercise because physical activity levels are decreasing while obesity rates are increasing. Goal orientations, physical self-worth, perceived physical competence, and intrinsic motivation towards physical activity are empirically and theoretically related to each other and to physical activity levels. Despite these relationships, little research has examined these factors as a function of weight status. The purpose of this study was to examine the previously mentioned constructs and weight status in adolescents. It was predicted that adolescents with an unhealthy weight status would have higher performance avoidance goal orientation, lower physical self-worth, lower perceived physical competence, and higher extrinsic motivation towards physical activity. The participants consisted of 107 male and female middle school students ranging in age from 12 to 14 years. Instrumentation examined previously mentioned constructs as well as self-reported sedentary behavior, physical activity, height, weight, gender, and birth date. Subjects' weight status was classified as underweight, normal, overweight, or obese based on calculated BMI percentile rankings. MANOVA showed the obese group to have significantly higher avoidance goal orientations than other groups. The normal weight group reported significantly higher physical self-worth, perceived physical competence, and physical activity levels compared to the other groups. Intrinsic motivation and sedentary time were not significantly different between weight status groups. Bivariate correlations demonstrated that approach goal orientations, physical self-worth, perceived physical competence, intrinsic motivation, and physical activity levels were positively correlated with each other and negatively correlated with sedentary time. Avoidance goal orientations were shown to be negatively correlated with physical self-worth and aspects of intrinsic motivation. This study showed that overweight and obese youths have a motivational profile that is different from healthy youths. MANOVA testing showed that youths with unhealthy weight statuses have comparatively lower physical self-worth and perceived physical competence paired with avoidance goal orientations. This motivational profile has been hypothesized to be associated with avoiding activities in order to prevent feelings of failure. These findings may help explain why unhealthy youths fail to change unhealthy habits.

Presentation Number P-38

ABSTRACT:

Abstract Title:	**Investigation of Proteins Involved in the Pathogenesis of the Food-Borne Bacterium *Campylobacter Jejuni***		
Presenter:	Zachary Farino		
Mentor:	Dr. Michael Konkel		**Honors** No
Authors:	Zachary J. Farino, Jason M. Neal-McKinney, and Michael E. Konkel		
Presentation Type:	Poster	**College and Major:**	Arts and Sciences: Zoology, Pre-Med Option
Category:	Molecular, Cellular, and Chemical Biology		

Approximately 2 million cases of enteritis caused by *Campylobacter jejuni* occur annually in the United States. Common symptoms include diarrhea containing blood due to invasion of epithelial cells lining the gastrointestinal tract.

In order for *C. jejuni* to invade it must first travel to the intestine and then deliver Cia (Campylyobacter invasion antigens [Cia]) proteins into its cytoplasm of intestinal cells. Many bacterial pathogens utilize two separate nanomachines in this endeavor. First, a flagellum is used to propel the bacterium through its environment; as well as a second apparatus associated with the delivery of virulence (effector) proteins.

Recent studies demonstrate that *C. jejuni* utilizes the same export structure to secrete proteins involved in assembling a flagellum, as well as for delivering virulence proteins.

We hypothesized that *C. jejuni* utilizes a novel mechanism to mediate the switch between constructing a motile flagellum and a Cia delivery apparatus, which is central to its virulence strategy.

We developed mutant strains of *C. jejuni* through replacing targeted genes of interest with an antibiotic-resistance cassette via homologous recombination. Thereby we were able to discern the role of each gene and protein in its ability to deliver proteins to the host cells cytosol and invade. The *C. jejuni* mutants where characterized using the following assays: 1) motility assays to determine if the proteins are necessary for bacterial movement; 2) secretion and delivery assays to examine if the protein is involved in Cia export and/or subsequent delivery to the cytoplasm of intestinal cells; 3) binding and internalization assays to determine if the protein is directly involved in the virulence strategy of *C. jejuni*; 4) transmission electron microscopy in order to visualize the flagellum of the mutant strains.

Preliminary assays suggest that the proteins investigated are involved in the virulence strategy of *C. jejuni*. Uncovering the mechanism of pathogenesis utilized by *C. jejuni* will be useful in developing therapeutic interventions applicable to many bacterial pathogens that use a similar virulence strategy.

Presentation Number P-39

ABSTRACT:

Abstract Title:	**Nitrous Oxide Flux Measurements above Agriculture Systems in the Pacific Northwest**			
Presenter:	Laurel Graves			
Mentor:	Shelley Pressley			**Honors** Yes
Authors:	Laurel Graves, Sarah Waldo, Shelley Pressley, Brian Lamb			
Presentation Type:	Poster	**College and Major:**	Engineering and Architecture: Civil Engineering	
Category:	Engineering and Physical Sciences			

Agriculture is one of the largest contributors of nitrous oxide (N_2O) to the atmosphere due to the heavy reliance on nitrogen-based fertilizers. N_2O is considered to be the third most important greenhouse gas, with 300 times the global warming potential of CO_2. The Regional Approaches to Climate Change (REACCH) project has the goal to adapt to and mitigate climate change effects in Pacific Northwest agriculture and one objective is to analyze greenhouse gas fluxes from cereal crops. In order to assess the impact of cereal crop rotations on emissions of N_2O in the region, continuous fluxes of N_2O must be measured. However, low concentrations of N_2O and high spatial and temporal variability of N_2O emissions make it difficult to use direct methods for measuring fluxes. One alternative is the gradient flux method. With this method the concentration of N_2O is measured at two different heights, and the flux is inferred from the concentration gradient. During the summer of 2012 a gradient system was designed, built, and deployed at one of the REACCH agricultural sites. This project describes the testing and validation of the gradient system using a tracer release technique to simulate N_2O emissions. The goal is to determine the minimum detection limit of N_2O fluxes measured with the gradient system. Additionally, we compare our N_2O flux values with those from other studies to put our values into context and to determine if our results are region specific. In the spring, once testing is complete, the gradient system will be deployed to measure the expected spikes in N_2O emissions associated with rising temperatures, fertilizer application, and wet conditions.

Presentation Number P-40

ABSTRACT:

Abstract Title:	**Use of Cytokines And Inhibitors to Validate Proposed Gene Network Regulation of Ovarian Follicle Assembly and Transition**			
Presenter:	Amanda Feeney			
Mentor:	Mike Skinner			**Honors** Yes
Authors:	Feeney, A. Nilsson, E.E., Skinner, M.K.			
Presentation Type:	Poster	**College and Major:**	Veterinary Medicine: Neuroscience	
Category:	Molecular, Cellular, and Chemical Biology			

The follicles in the arrested primordial follicle pool in mammalian ovaries undergo transition to the growing primary stage over a female's reproductive lifespan. After primordial to primary follicle transition, a follicle will continue to develop until it undergoes atresia, or ovulation occurs. Menopause occurs when the pool of primordial follicles has been depleted. Previously, gene bionetwork analyses were conducted to determine what genes were regulated in the ovary during both follicle assembly and primordial to primary follicle transition. In this current study, several key factors from the proposed gene networks have been chosen to analyze further *in vitro* to demonstrate whether the proposed regulatory networks are predictive. These candidate regulatory points in these networks will be tested using ovarian organ culture experiments to evaluate follicle assembly or primordial follicle transition. Ovaries were removed from 0 day-old Sprague-Dawley rat pups (for ovary follicle assembly studies) or 4 day-old rat pups (for ovary follicle transition studies). These ovaries were then placed into a whole organ culture system. Ovaries were treated with cytokines Interleukin 16 (IL-16), Delta-like 4 (Dll4) or Wnt-3a, or with tyrphostin inhibitors SP600125, BCI, or LDN193189. Preliminary results indicate that the cytokines Interleukin 16 and Dll4 promote ovary follicle transition as compared to the controls, while results have been inconclusive for Wnt3a. In immunohistochemical experiments with IL-16 and CD4, it seems that both the cytokine and its receptor are localized to the granulosa cells surrounding each ovarian follicle. The tyrphostin inhibitor BCI increased assembly significantly, but had no effect on primordial follicle transition. BCI also significantly reduced total number of follicles as compared to controls. LDN193189 shows a trend for promoting primordial to primary follicle transition. These results in part support the previous proposed gene regulatory networks developed in the Skinner laboratory. Understanding the regulators of early follicle development could lead to solutions for infertility in mammals, including humans.

Presentation Number P-41

ABSTRACT:

Abstract Title:	**Princess Diana: A Study in Creative Interpretation**			
Presenter:	Gordon Stumpo			
Mentor:	Patricia Fischer			**Honors** No
Authors:	Gordon Stumpo			
Presentation Type:	Poster	**College and Major:**	Agricultural, Human, and Natural Resource Sciences: Apparel Design Arts and Sciences: Chinese Language and Culture	
Category:	Arts and Design			

I created two designs to submit in a fashion design competition sponsored by charities to raise money for breast cancer. The challenge was to design a gown for Princess Diana and I created two designs. Before sketching, I researched what Princess Diana wore when she was in the public eye. From this research, I knew the shape of the gowns I wanted to design would be fitted in the upper body and feature ankle-length hems to best capture the svelte form of Princess Diana.

The first gown incorporates a halter neckline, a narrow skirt with a slit, and a diamond shaped design detail on the front. I incorporated these design elements because a halter neckline would look elegant on the slender neck of Princess Diana and the diamond shaped detail on the front reflected the clean cut styles which Princess Diana wore. In order to create this design, I combined a basic shirt and skirt pattern, then manipulated them to change the structure to match my sketch. I had to research the different ways to manipulate patterns to achieve the result I wanted, especially with the halter neckline and in crafting and sewing the corners on the diamond shaped design detail.

The second gown has a voluminous skirt, multiple layers of fabric, and beading. I chose these design details because tall women like Princess Diana look stunning in a full, flowing skirt. She often wore clothing with embellishment, so I added beading. I combined the same basic patterns in a different manner and had to research adding fullness to a gown and making a corset for structure underneath the gown. I added twelve layers of fabric on the sides of the gown and used beading to hold the top layers on the gown without actually sewing it into the gown.

The process of designing, patterning, and sewing these gowns really pushed my knowledge and creativity limits and greatly expanded upon classroom learning. Since I have only had one patternmaking class, I had to thoroughly research and test each step of the pattern to ensure proper fit and style.

Presentation Number P-42

ABSTRACT:

Abstract Title:	**Analysis of BDNF Induced Dendritic Growth in Hippocampal Neurons**		
Presenter:	Elizabeth Graham		
Mentor:	Gary Wayman		**Honors** Yes
Authors:	Elizabeth Graham, Adam Lesiak, Soren Impey, Gary Wayman		
Presentation Type:	Poster	**College and Major:**	Veterinary Medicine: Neuroscience
Category:	Molecular, Cellular, and Chemical Biology		

The structure and shape of a neuron is essential for making connections with other cells and for proper brain function. Failure to develop appropriate connections leads to numerous cognitive deficits and is associated with disorders including depression, Down's syndrome, and Fragile X Syndrome. Brain derived neurotrophic factor (BDNF) is a molecule produced in the brain that stimulates growth in neurons and helps them develop proper connections. The mechanism for BDNF-induced neuronal development is not well understood. Exposure to BDNF induces a 25% increase in outgrowth in cultured hippocampal neurons over unstimulated neurons. A potential mechanism for this increase in dendritic outgrowth is through inhibition of RhoA, itself a known inhibitor of dendritic outgrowth. Since it is known that BDNF treatment stimulates an increase in two molecules known to inhibit RhoA: Rnd3 and Par6C; we hypothesize that the expression of either or both molecules might play a role in BDNF induced dendritic outgrowth. Here we show that expression of either Rnd3 or Par6C is capable of stimulating dendritic outgrowth by approximately 50%, and that expression of both molecules is necessary for BDNF to induce outgrowth. Both Par6C and Rnd3 are known to inhibit RhoA by activating p190RhoAGAP, a direct inactivator of RhoA. When p190RhoAGAP is inhibited, dendritic outgrowth is not increased above control levels, despite BDNF treatment or co-expression of Par6C and Rnd3. Thus, Rnd3 and Par6C are essential mediators of BDNF-induced dendritic outgrowth, and may play a crucial role in the development of the central nervous system.

Presentation Number P-43

ABSTRACT:

Abstract Title:	**Identifying Polymorphisms within AB, WIK, and SJD Zebrafish Strains**		
Presenter:	Marea Cobb		
Mentor:	Dr. Cynthia Cooper and Dr. Alexander Dimitrov		**Honors** No
Authors:	Marea Cobb		
Presentation Type:	Poster	**College and Major:**	Arts and Sciences: Biology
Category:	Molecular, Cellular, and Chemical Biology		

Melanoma, a cancer of the skin, is caused by exposure to UVR, UVA, and UVB rays resulting in uncontrolled proliferation of melanocytes. Zebrafish melanophores are used as a model to understand how human melanocytes function. Dr. Cynthia Cooper's Genetics Lab focuses on how various mutations in melanophores affect pigmentation and function. Analyses of southern blots are done regularly by eye in Dr. Cooper's lab. This project plans to automate this process to assist in the analysis of these images and to relieve lab technicians of this task. Specifically, this project will be using Quantity One, a software analysis, to collect quantitative information on each blot. This information will be imported into my designed program where it is further analyzed through a statistical algorithm. The final return of this program is to identify polymorphisms within the gels or to determine where a mutation may exist within the zebrafish DNA.

Presentation Number P-44

ABSTRACT:

Abstract Title:	**Redefining CpG Islands with Empirical DNA Methylation Data from Retrotransposed Sequences**			
Presenter:	Fiorella Grandi			
Mentor:	Dr. Wenfeng An			**Honors** No
Authors:	Fiorella C Grandi, James M Rosser, Wenfeng An			
Presentation Type:	Poster	**College and Major:**	Veterinary Medicine: Genetics and Cell Biology / BioChemistry	
Category:	Molecular, Cellular, and Chemical Biology			

In complex organisms, over 50% of the genes in a given cell are repressed. Such unique patterns of gene expression are responsible for cell differentiation and function. Gene repression is partly achieved through DNA methylation, a chemical modification that occurs at CpG dinucleotides and can be passed from cell to cell. In early embryos and germ cells, DNA methylation is reprogrammed. The vast majority of the CpG dinucleotides in the genome are methylated while regions with high CpG density, termed CpG islands (CGIs), remain unmethylated. However, the manner in which the cell translates sequence information into methylation patterns is not well understood. Several factors, including the CpG density and presence of transcription start sites, may be responsible for demarking these regions.

To investigate the sequence determinants for CpG islands, we used a transgenic L1 element to introduce novel sequences into various locations in the mouse genome. L1 is a mobile DNA element that constitutes 20% of the mouse genome. It mobilizes itself and other DNA sequences by a “copy and paste” mechanism. Our L1 transgene includes sequences of varied nucleotide composition, allowing us to survey factors affecting DNA methylation patterns. Our analysis has revealed that, as a whole, the sequence is highly methylated in somatic tissues but devoid of methylation in germ cells regardless of genomic location. Additionally, our findings suggest that CpG density is a major determinant in allowing the cell to recognize CpG islands, as areas of the mobilized sequence with higher CpG densities remain less methylated than regions with lower densities. Two insertions, derived from the same L1 transgene, demonstrated drastic differences in their levels of methylation. When the sequence was positioned to create a long and dense island of CpG’s, it was unmethylated. However, a rearrangement of this sequence resulting in decreased CpG density was highly methylated. In summary, our studies with L1 retrotransposons have allowed us to postulate parameters that dictate how CpG islands are recognized by the cell. We plan to conduct genome-wide methylation studies by combining computational and experimental approaches to determine if these parameters are acting globally in the genome.

Presentation Number P-45

ABSTRACT:

Abstract Title:	**The Role of Fiber in the Diets of a Sagebrush Generalist and a Sagebrush Specialist Species**			
Presenter:	Miranda Crowell			
Mentor:	Dr. Lisa Shipley			**Honors** No
Authors:	Miranda Crowell, Meghan Camp, Lisa Shipley			
Presentation Type:	Poster	**College and Major:**	Agricultural, Human, and Natural Resource Sciences: Wildlife Ecology	
Category:	Organismal, Population, Ecological, and Evolutionary Biology			

The diet of the pygmy rabbit, a species of concern in the north-western United States, consists largely of sagebrush. Pygmy rabbits eat a portion of woody stems but predominately prefer the leaves of sagebrush. These woody stems contain fiber, which makes this part of their diet difficult to digest. We investigated preference by pygmy rabbits (*Brachylagus idahoensis*) and mountain cottontails (*Sylvilagus nuttallii*), which reside in similar habitats, for foods that varied in fiber content and digestible protein by offering rabbit diets that varied in the levels of fiber. We calculated five different pellet recipes, each decreasing in digestibility and increasing in the amount of fiber. We conducted a feeding trial using different combinations of two rabbit pellet diets for two days each. Diets consisted of a ratio of Purina professional rabbit chow to rice hulls and were as follows; 1:0, 10:1, 4.5:1, 2.5:1, and 1.5:1, which spanned estimated fiber content from 35 – 50% neutral detergent fiber and 50 – 68% digestibility. Pygmy rabbits consistently consumed more of the lowest fiber/ highest digestibility diets when paired with all higher fiber/lower digestibility diets, showing that pygmy rabbits can detect even small changes in fiber content. Trials with mountain cottontails are still in progress but we hope to discover the preferred digestibility and fiber content chosen by both species, and expect the larger mountain cottontails to be less selective of fibrous foods. This research will contribute to further studies investigating the tradeoffs between diet quality and hiding cover for pygmy rabbits and mountain cottontails.

Presentation Number P-46

ABSTRACT:

Abstract Title:	**Synthesis and Characterization of a New Nitrogen-Containing Ligand for Metal Ions Separation**			
Presenter:	Cody Havrilak			
Mentor:	Dr. Ken Nash			**Honors** No
Authors:	Cody Havrilak, Julie Muller, Ken Nash			
Presentation Type:	Poster	**College and Major:**	Arts and Sciences: Materials Science Chemistry	
Category:	Engineering and Physical Sciences			

A major limiting factor in the further development of nuclear power is the disposal of high-level radioactive waste from spent fuel. Currently, the PUREX (plutonium uranium refining by extraction) process can be used to recover plutonium and uranium from radioactive waste. However, potentially useful minor actinides are left in solution and contribute to the major radio-toxicity of nuclear waste. Further complicating this matter is the large amount of lanthanides dissolved in spent nuclear fuel. Trivalent actinide and lanthanide cations, An(III) and Ln(III), are difficult to separate from one another when in solution due to their similar physical-chemical properties of being strongly hydrated trivalent cations with similar ionic radii.

One approach to recovering these isotopes is through the development of novel, highly selective chelating organic ligands. Many nitrogen-donor ligands, such as BTBPs (bis-triazinyl bipyridines), have been studied in the past decades and have proven to be efficient for An(III) and Ln(III) separation but have been found to be unstable under highly acidic and radiolytic conditions.

In this project, a novel, tetradentate nitrogen donating ligand, 6,6'-bis(1-decyl-1H-1,2,3-triazol-4-yl)-2,2'-bipyridine (BDTB) has been synthesized. It combines the functionalities of bipyridine with trizole functional groups that are known to have better stability under highly acidic and radiolytic conditions, have better metal binding kinetics than the triazine rings of BTBPs and are easier to synthesize. Decyl chains are added to increase the overall lipophilicity. After solvent extraction studies, characterization of the ligand and its metallic complexes will be performed using various complementary techniques, such as NMR, UV-Vis, IR and XRD (x-ray diffraction crystallography).

Presentation Number P-47

ABSTRACT:

Abstract Title:	**Phenotypic Evaluation of Rht 18 Mapping Population in Wheat**			
Presenter:	Nathan Grant			
Mentor:	Dr. Kulvinder Gill			**Honors** No
Authors:	Nathan Grant, Amita Mohan, Kulvinder S. Gill			
Presentation Type:	Poster	**College and Major:**	Agricultural, Human, and Natural Resource Sciences: Integrated Plant Sciences / Agricultural Biotechnology	
Category:	Molecular, Cellular, and Chemical Biology			

Important plant growth hormone gibberellic acid (GA)-deficient wheat and rice were instrumental in bringing Green Revolution. More than 95% of the world grown wheat contains the same Rht dwarfing genes, *Rht1* or *Rht2*. This genetic uniformity may become a bottleneck for further improvement of the wheat plant if any negative effects are associated with these genes as suggested by some of the recent reports. Other than these two Rht mutants, 18 other are reported to reduce plant height with few having known chromosome locations. Further, these mutants are in different genetic background thus, the available information hampers the comparisons. With the aim to map *Rht 18,* v. ICARO (mutant) was crossed with Indian and resulting F_2 progenies were evaluated in the green house for height, tillers, and awns along with the parental control. The F_2 progenies showed a range in height distribution with many plants resembling the height of ICARO mutant (65%). The tiller number has bell curve distribution with the most common tiller number localized around both parents. During the summer of 2012 the $F_{2:3}$ families were grown at the Spillman Farm, WSU. Plant height of $F_{2:3}$ families segregated in mendelian ratio of 1:2:1. Most of the $F_{2:3}$ families have tiller number similar to the parents. DNA was extracted from the leaves of F_2 progeny along with parents. Of the ~700 SSR markers screened, 154 were polymorphic between the parents. Presently, we are genotyping the F_2 population using the polymorphic markers with the aim to map this gene.

Presentation Number P-48

ABSTRACT:

Abstract Title:	**Structure-Activity Study of the Response of Vagal Afferent Neurons to Fatty Acids**			
Presenter:	Drew Neyens			
Mentor:	Steven Simasko			**Honors** Yes
Authors:	Drew Neyens, Steven Simasko			
Presentation Type:	Poster	**College and Major:**	Veterinary Medicine: Neuroscience	
Category:	Molecular, Cellular, and Chemical Biology			

The vagus nerve plays an important role in both sensing and inducing changes in the GI tract during a meal that help coordinate digestion and regulate food intake. The release of intestinal cholecystokinin (CCK) by the entry of fat into the duodenum contributes to satiation in a vagally dependent manner. It is suspected the release of CCK by free fatty acids (FFAs) present in a meal is mediated by the FFA-sensitive G-protein coupled receptors GPR40 and/or GPR120 expressed by enteroendocrine cells of the intestinal epithelia. However, we have recently found that FFAs can directly stimulate vagal afferents. To determine whether GPR40 and/or GPR120 mediate this activity as well, we conducted a structure-activity study of FFA of varying carbon chain lengths. Cell bodies of vagal afferent neurons were isolated from nodose ganglia of male rats and used for fluorescent calcium imaging studies. Butyric acid (C4) did not activate vagal afferents but caproic (C6), caprylic (C8), capric (C10), oleic (C18:1), linoleic (C18:2), linolenic (C18:3,) and DHA (C22) were all capable of activating nodose neurons. These observations are consistent with the response being mediated by GPR40 and/or GPR120. The significance of this direct action of FFA on vagal afferents themselves remains to be determined. Further understanding of these processes may yield insight into possible causes or treatments for obesity.

Presentation Number P-49

ABSTRACT:

Abstract Title:	**Comparison of Intake of a Plant Secondary Metabolite by Deer Subspecies and Season**			
Presenter:	Marley Iredale			
Mentor:	Dr. Lisa Shipley			**Honors** Yes
Authors:	Marley Iredale, Dr. Lisa Shipley, Amy Ulappa			
Presentation Type:	Poster	**College and Major:**	Agricultural, Human, and Natural Resource Sciences: Wildlife Ecology	
Category:	Organismal, Population, Ecological, and Evolutionary Biology			

Due to the general physiology of plants, such as their high fiber and toxic metabolites, herbivores face many challenges in meeting their nutrient demands. An herbivore's ability to tolerate or detoxify plant secondary metabolites (PSMs) depends on environmental conditions and genetic adaptation. For example, it has been demonstrated that these compounds tend to increase in concentration as the levels of carbon dioxide in the atmosphere increase. Similarly, digesting PSMs is metabolically expensive and may be more detrimental to survival during winter, when other metabolic processes are more important. With the potential for an increase in the concentrations of these compounds due to global climate change and their negative effects on browsers, it is important to understand the response of herbivores to increased levels of PSMs. In this study I compared the voluntary intake by two subspecies of deer, black-tailed deer (*Odocoileus hemionus columbianus*) and mule deer (*O. h. hemionus*), of a PSM, alpha-pinene, which is common in both summer and winter browse. I hypothesized that 1) intake of alpha-pinene soaked herbivore pellets would decrease as the concentration of alpha-pinene increased, 2) the rate of intake decline would be greater in winter than summer, and 3) that the subspecies would differ in their voluntary intake of alpha-pinene. During the summer, we found that deer began reducing intake of food pellets at the lowest level of alpha-pinene (1%), and when alpha-pinene reached 3%, intake was, on average, 1.3% of intake of alpha-pinene-free pellets. Data are still being collected and analyzed, but preliminary results show that during the winter, deer began reducing intake of food pellets at the lowest level of alpha-pinene (1%), and when alpha-pinene reached 1%, intake was, on average, 0.4% of intake of alpha-pinene-free pellets. The slopes of the relationship between intake and alpha-pinene concentration in food did not differ with deer subspecies, suggesting that they had equal tolerances for alpha-pinene in forages.

Presentation Number P-50

ABSTRACT:

Abstract Title:	**Influence of Opoid Peptide Antiserum on the Acute Antinociceptive Effect of Hyperbaric Oxygen in Mice**		
Presenter:	Jacqueline Heeman		
Mentor:	Dr. Raymond Quock		**Honors** No
Authors:	**Jacqueline H. Heeman**[a], Faya Zhang[b], Carlyn C. Zylstra[b], Donald Y. Shirachi[c] and Raymond M. Quock[b]		
Presentation Type:	Poster	**College and Major:**	Education: Athletic Training
Category:	Molecular, Cellular, and Chemical Biology		

The FDA has approved the use of hyperbaric oxygen (HBO_2) for thirteen clinical indications, but it is yet to be approved for treating neuropathic pain. The purpose of this study was to examine the role of endogenous opioid peptides in the spinal cord in the acute antinociceptive effect of HBO_2 in mice. Male NIH Swiss mice were exposed to HBO_2 (100% oxygen @ 3.5 ATA) 30 min following intrathecal (i.t.) pretreatment with rabbit antisera (AS) against the rat endogenous opioid peptides methionine-enkephalin (ME), dynorphin (DYN) and β-endorphin (βEP). Responsiveness to HBO2-induced acute antinociception was examined using the glacial acetic acid-induced abdominal constriction model. In mice pretreated i.t. with normal rabbit serum (control), HBO_2 produced a 59% antinociceptive response. In mice pretreated i.t. with DYN AS, ME AS and βEP AS, HBO_2 produced 27%, 52% and 46% antinociceptive responses, respectively. In conclusion, the dramatic decrease in the antinociceptive effect in mice pretreated with DYN AS suggests that DYN as the primary endogenous opioid peptide in the spinal cord that mediates HBO_2-induced antinociception. (This research was supported by the Allen I White Distinguished Professorship and an institutional Summer Undergraduate Research Fellowship (SURF) Award from the American Society for Pharmacology and Experimental Therapeutics.)

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Presentation Number P-51

ABSTRACT:

Abstract Title:	**Elucidation of Campylobacter Jejuni Gene Expression Profile in Response to Intestinal Cells**		
Presenter:	Mayumi Holly		
Mentor:	Michael Konkel		**Honors** No
Authors:	Mayumi Holly		
Presentation Type:	Poster	**College and Major:**	Veterinary Medicine: Microbiology
Category:	Molecular, Cellular, and Chemical Biology		

Campylobacter jejuni is a bacterium that causes diarrheal illness throughout the world. In the human intestine, the bacteria adhere to and invade the cells lining the intestine using a combination of surface exposed proteins and secreted proteins that are delivered to the target intestinal cell. Preliminary research showed that a bacterial protein synthesis inhibitor prevented cell invasion, indicating that C. jejuni is not invasion ready until after exposure to human cells. The goal of this study was to identify changes in bacterial gene expression in response to the presence of intestinal cells in order to identify the critical invasion proteins. A binding and invasion assay, Raman spectroscopy, and quantitative real-time PCR were used in this study. The binding and invasion assays demonstrated that an incubation period of 90 minutes with intestinal cells was sufficient to increase the invasiveness of C. jejuni. At the 90 minute time point, Raman spectroscopy revealed that the C. jejuni surface proteins were significantly changed. Based on these data, total RNA was extracted from C. jejuni grown in the presence and absence of host cells for 90 minutes. The total RNA was then analyzed using quantitative real-time PCR (qPCR). We found that the bacterial genes encoding surface exposed proteins are expressed at greater levels in the presence of cells at 90 minutes versus C. jejuni grown without cells as shown by qPCR. These results suggest that proteins that facilitate adherence to and invasion of host cells are changing following incubation of C. jejuni with intestinal cells. RNA sequencing will be used in combination with computer analysis to dissect the global gene expression profile of C. jejuni in response to host cell contact. This work is significant because it will allow us to better understand the mechanism that C. jejuni utilizes to invade intestinal cells and cause disease.

Presentation Number P-52

ABSTRACT:

Abstract Title:	**Regents Hill: Understanding the Legacy of Modernism at Washington State University**		
Presenter:	Julia (Misha) Gonzalez		
Mentor:	Dr. J. Phil Gruen		**Honors** Yes
Authors:	Julia (Misha) Gonzalez		
Presentation Type:	Poster	**College and Major:**	Engineering and Architecture: Architecture
Category:	Arts and Design		

In 1952 a new women's dormitory called Regents Hill was opened on the main campus of Washington State College. Designed by the celebrated Seattle architect Paul Thiry, it was one of the first permanent buildings constructed on the campus in over a decade. Regents Hill presents a strong, clear vision of campus life in the mid-twentieth century and serves as a valuable window into the institution's modernist past. This dormitory, made up of three constituent buildings (Stearns, Barnard, and McGregor), is a unique example of International Style design not only for the campus but also in the Palouse region. This study uses a range of primary documents available through the WSU Libraries' Manuscripts Archives and Special Collections (MASC) to develop an argument asserting that the strength of Regents Hill is rooted in its temporal and regional context. Modern architecture at Washington State University reflects an era no less notable than any other in its history. Yet, despite the historic value of buildings like Regents Hill, the presence of modern design on the WSU campus remains threatened. The aim of this research is to shed light on the history of Regents Hill and in doing so to present an alternative framework for interpreting and understanding the value of such a building within its campus context.

Presentation Number P-53

ABSTRACT:

Abstract Title:	**Pesticide Induced Epigenetic Transgenerational Inheritance of Disease-States and Tissue Abnormalities**		
Presenter:	Elizabeth Houser		
Mentor:	Eric Nilsson		**Honors** No
Authors:	Elizabeth Houser, Mohan Manikkam, Rebecca Tracey, Colleen Johns, Michael Skinner		
Presentation Type:	Poster	**College and Major:**	Arts and Sciences: Biology
Category:	Molecular, Cellular, and Chemical Biology		

Ancestral exposure to endocrine disrupting compounds (EDCs) in the environment has shown to cause adult onset disease in future generations. The current study histologically examined the tissues of the offspring of F3 generation descendents of F0 generation pregnant rats treated separately with the insecticides DDT and Methoxychlor. The treated-lineage and control-lineage F3 generation rats were either outcrossed (treated-lineage males bred with wildtypes) or reverse outcrossed (treated-lineage females bred with wildtypes). The subsequent F4 outcrossed and reverse outcrossed generation histopathology results were used to determine through which germline (male or female) transmission of epigenetic mutations and disease is carried. Disease states in specific tissues were found to have been inherited through various germlines for the different compounds. High incidence of kidney disease was determined to have been inherited from the F3 female (ROC) and F3 male (OC) lineages of DDT treatment to the F4 male animals, as well as the F4 ROC females showing a strong trend in kidney disease rate. Kidney disease was also found to have been passed down from the F3 ROC Methoxychlor line to both the F4 male and female generation. The F4 ROC DDT line was observed to have inherited high rates of ovarian disease from the ROC F3 DDT lineage, however the F4 ROC Methoxychlor generation was found to have no significant rate of ovarian disease though the generation preceding it had very high incidence of tissue abnormalities. This could indicate that the phenotype for the ovarian disease onset is only expressed when both parents are exposed to the compound and both contribute the epigenetic mutation.

Presentation Number P-54

ABSTRACT:

Abstract Title:	**Topographic Influence on Phosphorus forms during Early Soil Development on a Mount Saint Helens Pyroclastic flow**		
Presenter:	Melissa Knudson		
Mentor:	John Bishop; John Harrison		**Honors** No
Authors:	Melissa Knudson, John Bishop, John Harrison		
Presentation Type:	Poster	**College and Major:**	Arts and Sciences: Environmental Science
Category:	Engineering and Physical Sciences		

In terrestrial ecosystems, nitrogen (N) and phosphorus (P) are essential for primary production. However, P differs from N in that it has no gaseous input that continuously contributes to its availability in soils. Nearly all P present in terrestrial ecosystems is derived from the weathering of the primary mineral apatite whose supply is initially fixed and decreases over time. Walker and Syers (1976) have proposed a conceptual model of ecosystem P dynamics based on such a fixed supply. Their model predicts that as P is liberated from parent material through weathering, it is stored in plant and soil pools before it is made locally unavailable through occlusion or lost from the system by leaching. While considerable work exists investigating P dynamics and soil development in well-developed tropical systems, less work exists for very young, temperate systems. The soils developing near Mount St. Helens, Washington provide a rare opportunity to examine P dynamics more closely as it is unclear to what degree this recovering system conforms to such a model. This work investigates the significance of topography on soil phosphorus dynamics in a recovering ecosystem by examining depression and surrounding upland soils. and comparing these results to historical data. in an attempt to reveal how relative P amounts and forms have changed in these topographic sites since the 1980 eruption. Our results indicate a significant relationship between topography and total and available P and support the theoretical model proposed by Walker and Syers (1976) that total P in this system has decreased over time.

Presentation Number P-55

ABSTRACT:

Abstract Title:	**Transgenerational DNA Methylation Variability in Sperm of Individual Rats with Ancestral Vinclozolin Exposure**			
Presenter:	Tiffany Hylkema			
Mentor:	Dr. Michael Skinner			**Honors** Yes
Authors:	Tiffany Hylkema, Carlos Guerrero-Bosagna, Michael Skinner			
Presentation Type:	Poster	**College and Major:**	Veterinary Medicine: Genetics & Cell Biology	
Category:	Molecular, Cellular, and Chemical Biology			

Several common human diseases and cancers have recently been linked with exposure to environmental factors. Nutritional compounds and various toxicants are known to influence the activity of the genome through molecular factors and processes independent of DNA sequence, known as epigenetics, especially if exposure to such compounds occurs during early development. One of the most well studied epigenetic factors is DNA methylation, the enzymatic addition of a methyl group to DNA. Studies on the agricultural fungicide vinclozolin in the rat model have shown that exposure of a male embryo (through a pregnant mother) during the sex determination period of development can result in testis abnormalities, prostate disease, immune abnormalities and infertility in the adult males. Recent research has shown that these diseases can be transmitted to subsequent generations through the male due to permanently altered DNA methylation patterns in sperm cells. Changes in DNA methylation were previously identified in pools of sperm DNA from descendants of vinclozolin-exposed ancestors. The goals of our present research are to (i) analyze the sperm DNA methylation patterns of individual animals, (ii) identify variability in gene specific DNA methylation among individual animals, and (iii) compare germline sperm DNA methylation patterns of F3 to F1 generation animals. The idea is to test if specific alterations seen transgenerationally may be identified as germline epigenetic biomarkers to indicate ancestral exposure and if these biomarkers may be linked to specific individual phenotypes. Two promoter regions previously identified as having transgenerational changes in sperm DNA methylation were chosen for analysis: (i) potassium voltage-gated channel, Isk-related family, member 2 (KCNE2) and (ii) inositol pholyphosphate phosphatase-like 1 (Inppl1). Our research has shown that F3 generation methylation changes in KCNE2 and Inppl1 identified in pools of DNA are reproducible when the individual DNAs used in the previous experiment are analyzed. Increased variability is seen in sperm DNA methylation of F3 generation vinclozolin versus control animals.

Presentation Number P-56

ABSTRACT:

Abstract Title:	**Identification of Mutations in EDN2 Transcription Binding Factor Sites may be Associated with Susceptibility to Johne's Disease**			
Presenter:	Bonnie Knie			
Mentor:	Dr. Holly Neibergs			**Honors** No
Authors:	B.A.Knie, E.R. Scraggs, Z. Wang, H.L. Neibergs			
Presentation Type:	Poster	**College and Major:**	Agricultural, Human, and Natural Resource Sciences: Animal Science	
Category:	Organismal, Population, Ecological, and Evolutionary Biology			

Johne's disease is the result of infection with *Mycobacterium avium* ssp. *Paratuberculosis* (Map). This fatal disease in cattle is increasing in prevalence, particularly in large dairy herds. One way to reduce the prevalence of the disease is to select for cattle that are not susceptible to Map infection. Previously, we have identified DNA variants that modified binding of transcription binding factors for *EDN2* through SNP arrays and functional assays. The objective of this study was to identify additional DNA variants that result in regulatory changes in expression of *EDN2* that would result in susceptibility to Map infection. Polymerase chain reaction primers were designed to span 1kb 3' to the *EDN2* start site and encompassed the previously identified transcription binding factor variant located 671 bp from *EDN2* that binds VDR, RUNX2, AP-2a, MEF-2C, PAX-5 and RFX3. Polymerase chain reaction was conducted with high fidelity *Taq* polymerase (Invitrogen, Grand Island, NY) to produce products of 1024 bp. PCR products were purified using the Qiagen QIAquick kit (Gaithersburg, MD) and sequenced at Eurofin Operon MWG (Huntsville, AL). Sequence was compared to the UMD 3.1 *Bos taurus* annotated sequence and sequence data was confirmed with results from both DNA strands. An additional DNA variant for a transcription binding factor was identified 431 bp from *EDN2* with binding motifs for lymphoid transcription factor, early growth response 4 and early growth response 1. Functional assays will be completed to determine the effect of this variant on susceptibility to Johne's disease.

Presentation Number P-57

ABSTRACT:

Abstract Title:	**Canine Carcinoma Cells Containing Prostate-Specific Membrane Antigen Have Been Identified for Therapeutic Study**		
Presenter:	Jacqueline Johnson		
Mentor:	Clifford E. Berkman		**Honors** No
Authors:	Jacqueline M. Johnson, Clifford E. Berkman, Lisa Y. Wu		
Presentation Type:	Poster	**College and Major:**	Veterinary Medicine: Biochemistry
Category:	Molecular, Cellular, and Chemical Biology		

Prostate specific membrane antigen (PSMA) has been localized as an integral membrane protein specific to prostate cancer tissue. PSMA remains an important protein for the study of prostate cancer and for testing therapeutic techniques. In hopes to further understand how prostate cells are affected by drug targets canine carcinoma cells (LEO) have been identified to also produce the PSMA marker. Similar studies with canine prostate cancer cells have not yet been done and LEO cells pose as a novel tool for research. Through studying the inhibition of different drug conjugates with the LEO cells it has been uncovered that LEO cells are similar to the human cells. Identification of the PSMA also being a marker in LEO cells was identified through the Western Blot technique. The LEO cells were then grown and their proteins extracted using a cell lysate and purification technique. Finally, binding and inhibition studies were performed using high performance liquid chromatography (HPLC) based assays and the results interpreted through the graphing software Kaleida-graph. The results indicate that canine cells are a viable option for therapeutic testing of prostate tumor inhibitors.

Presentation Number P-58

ABSTRACT:

Abstract Title:	**Effect of strain-annealing on Σ3 and Σ9 coincident site lattice density in Alloy 617**		
Presenter:	Jose Marcial		
Mentor:	Dr. Dave Field		**Honors** No
Authors:	Jose Marcial, Dr. Dave Field		
Presentation Type:	Poster	**College and Major:**	Engineering and Architecture: Materials Science and Engineering
Category:	Engineering and Physical Sciences		

The operating conditions of nuclear power plants require a material that can retain its integrity and withstand corrosion under elevated temperatures. Typically Ni-Cr alloys function well for corrosion resistance and have high mechanical properties. However, the polycrystalline features of this material adversely impact the alloy integrity at elevated temperatures due to migration of the grain boundaries. One inexpensive method to mitigate this behavior at these extreme conditions is to increase the twin grain boundary density during processing. Within the scope of this project Alloy 617 was processed and characterized through Electron Backscatter Diffraction with a Scanning Electron Microscope. The aim of this work was to determine the effect of various strain-annealing routes on the fraction of twin grain boundaries. It was observed that the twin boundary density of Alloy 617 could be increased to greater than 60%.

Presentation Number P-59

ABSTRACT:

Abstract Title:	**Optimization of Immunohistochemistry for Detection of Trichomonas vaginalis Proteins in Prostate Tissue of Men with Prostate Cancer**			
Presenter:	Patrick Joyce			
Mentor:	Dr. John F. Alderete			**Honors** No
Authors:	Patrick A. Joyce, Dr. James Stanton, Dr. John F. Alderete			
Presentation Type:	Poster	**College and Major:**	Veterinary Medicine: Biochemistry / Anthropology	
Category:	Molecular, Cellular, and Chemical Biology			

We have previously shown a relationship between seropositivity of men to the protist *Trichomonas vaginalis*, a common curable sexually transmitted infection, and risk of prostate cancer development. While these epidemiological studies are noteworthy, it remains necessary to obtain evidence for the parasite in the prostate tissue of seropositive men. A hallmark of a *T. vaginalis* infection is persistence in the infected human often without presentation of symptoms; a *T. vaginalis* infection can be described as latent in the prostate. Early histologic studies of men with trichomoniasis showed organisms associated with prostatic epithelial hyperplasia and inflammation. Thus, the observed correlation of prostate cancer with serostatus of men to *T. vaginalis*, along with the proximity of the prostate to the urethra in the urogenital tract where the parasite is known to infect, prompted us to investigate for the presence of *T. vaginalis* antigen in the prostate of seropositive men. Here we report preliminary findings on the optimization of protocols for the detection of *T. vaginalis* antigens in the prostate tissue of men using immunohistochemical techniques.

Presentation Number P-60

ABSTRACT:

Abstract Title:	**Physiological Trade-Off due to Immune Response to Blood-Feeding Ectoparasites**		
Presenter:	Emily Martin		
Mentor:	Dr. Jeb Owen		**Honors** Yes
Authors:	Emily Martin, Samantha Whiteside, Jeb Owen		
Presentation Type:	Poster	**College and Major:**	Arts and Sciences: Biology
Category:	Organismal, Population, Ecological, and Evolutionary Biology		

Parasites improve their fitness through exploiting hosts. A host limits fitness costs induced by a parasite through two strategies: resistance, which directly reduces the density of the parasite and tolerance, which minimizes the damage caused by infection without negatively affecting the parasite. Often, multiple parasite taxa infect one host, but the interacting effects of co-infection are not well understood. The project completes two objectives: 1) Determine the interacting effects of two ectoparasite taxa on the fitness of the host and 2) Determine if the host's acquired resistance against one parasite taxon influences the fitness of the second parasite taxon. Domestic chickens, the host, are exposed to two ectoparasite taxa, the southern house mosquito (*Culex pipiens)* and the northern fowl mite (*O. sylviarum)* over five weeks. There are three treatment groups: mites only, mosquitoes only, and mites and mosquitoes. Fitness and condition of the chicken are evaluated by calculating feed conversion efficiency and monitoring body weight and body temperature. The immune response to the ectoparasites is quantified by conducting periodic complete blood counts and ELISA, a test to quantify antibodies specific to mite and mosquito antigens. The size and number of the subsequent generation of mosquitos are used to assess the fitness of the mosquitoes. The findings may contain important implications for the risk assessment and prevention of pathogen transmission as many ectoparasites serve as pathogen vectors, including *C. pipiens,* which transmits West Nile Virus. Thus, elucidating the interacting effects ectoparasites on each other and on animal host is important for understanding the ecology of a disease. This will help to predict the spillover of zoonotic pathogens into human populations. Further studies will look at the effects of single and simultaneous infestations at different levels of parasite burden in a dosage-response design.

Presentation Number P-61

ABSTRACT:

Abstract Title:	**Hydrational Control of ETS-family Transcription Factors: a Possible Resolution of the "Specificity Conundrum"**			
Presenter:	Miles Linde			
Mentor:	Dr. Gregory M. K. Poon			**Honors** Yes
Authors:	Gregory M. K. Poon, Manoj M. Munde, Miles H. Linde, W. David Wilson			
Presentation Type:	Poster	**College and Major:**	Veterinary Medicine: Biochemistry	
Category:	Molecular, Cellular, and Chemical Biology			

The ETS family of transcription factors are widely distributed among the metazoan phyla and regulate the expression of a wide range of genes. Despite their functional diversity, all ETS proteins share a structurally conserved DNA-binding (or ETS) domain. Given the highly overlapping sequence preferences among ETS members, it is as yet unclear how ETS proteins achieve functional specificity, a problem known as the "specificity conundrum." Compounding this problem is a current lack of understanding of the biophysical mechanism of sequence selectivity among ETS binding sites. We hypothesize that the structural conservation among ETS domains disguises physicochemical heterogeneity in their mechanisms of sequence recognition. We have previously demonstrated that the ETS-family member PU.1 (Spi-1) recruits a cooperative network of water-mediated contacts along the protein-DNA interface for high-affinity binding. We have now compared the thermodynamics and kinetics of sequence recognition between the ETS domains of PU.1 and ETS1 which represent extremes of sequence divergence (~30% homology) in the ETS family. We found that the thermodynamics and kinetics between the two structurally conserved ETS domains are highly differentiated under physiological conditions. More precisely, whereas high-affinity PU.1 ETS-DNA binding is enthalpically driven against an entropic penalty, ETS1 ETS-DNA binding is entropically driven. Kinetically, whereas ETS1 ETS associates rapidly with a high-affinity cognate site, PU.1 ETS is strikingly slow. This profound difference in association rate constants means that the high-affinity PU.1 ETS-DNA complex, despite being somewhat thermodynamically less stable than the corresponding complex with ETS1, is significantly longer-lived. If these differences that underlie the intrinsic heterogeneity in site recognition by ETS proteins extend to protein-protein and domain-domain interactions, they offer one potential biophysical resolution to the specificity conundrum.

Presentation Number P-62

ABSTRACT:

Abstract Title:	**Sexual Orientation Based Discrimination in Hiring: Variation across State and Job Gender Type**			
Presenter:	Brooke De Witt			
Mentor:	Julie Kmec			**Honors** No
Authors:	Brooke De Witt			
Presentation Type:	Poster	**College and Major:**	Arts and Sciences: Sociology	
Category:	Social Sciences			

This research project explores employment discrimination based on sexual orientation in the hiring process. In most cases, discrimination is hard to see using direct observation or surveys because people can lie about discriminatory behavior. The modified audit study helps eliminate these problems. Using a modified audit study, I focus on discrimination against openly gay women in two different job types: janitor (a male-typed job) and maid (a female-typed job). Two nearly identical fake applications will be sent to each job. The major difference between applications is that one applicant will have been the treasurer of the Gay/Straight Alliance in high school (meant to dictate a lesbian sexual orientation) and the other will have been the treasurer of the U.S. Government Club. The applications will be sent to job postings in 12 states with varying laws prohibiting discrimination based on sexual orientation: four states have laws prohibiting discrimination based on sexual orientation, four states have laws prohibiting discrimination based on sexual orientation and gender identity, and four states have no such laws. This will allow a test of whether state law impacts employer behavior. By submitting applications to a masculine-typed job and a feminine-typed job, I will detect whether there is more or less discrimination against an openly gay women in masculine or feminine jobs. I will compare callback rates to see if they differ across sexual orientation status, state law, and job gender-type. A central goal of this study is to demonstrate the effectiveness of anti-discrimination laws.

Presentation Number P-63

ABSTRACT:

Abstract Title:	**Design of Fluorescent Probes to Study Dynamics of E-Cadherin During Tumor Progression and Metastasis**			
Presenter:	Matthew McFaul			
Mentor:	Dr. Subra Muralidharan			**Honors** No
Authors:	Matthew McFaul and Subra Muralidharan			
Presentation Type:	Poster	**College and Major:**	Veterinary Medicine: Biochemistry	
Category:	Molecular, Cellular, and Chemical Biology			

We are developing a physical-biochemical model for tumor progression and metastasis. As a tumor develops, the extracellular matrix of cells stiffens due to interstitial fluid accumulation, hardening tissue, and angiogenesis that exerts increased pressure on the tumor cells. We hypothesize that this mechanical stress elicits simultaneous physical and biochemical response that could contribute to tumor progression and metastatic phenotype formation. We are developing methods to tag mechanosensitive membrane proteins and lipids to monitor their spatial and temporal dynamics in model prostate cancer cells under mechanical stress to validate our hypothesis and formulate a physical-biochemical model for tumor progression and metastasis that cannot be fully understood with the current cancer models. The specific goal of this research is to tag mechanosensitive cell-cell adhesion protein E-cadherin with molecules employing the recently developed SNAP-Tag technology. E-Cadherin is a cell-cell adhesion membrane protein and is downregulated when normal cells become cancerous and progress to metastatic phenotype. The dynamics of E-Cadherin in model benign, nonmetastatic, moderately metastatic, and highly metastatic prostate cells subjected to tension, shear, and osmotic stress will be monitored by fluorescence microscopy.

We are currently designing and optimizing the expression of SNAP-cadherin plasmids that will be transfected into prostate cancer cells for tracking E-cadherin in response to mechanical stress such as osmotic, shear, and tension forces. Time dependent studies of the fluorescently tagged integrin will provide insights into its response to mechanical stress experienced by the cell membrane and the biochemical signaling involving integrin triggered by this response.

Presentation Number P-64

ABSTRACT:

Abstract Title:	**Conversion of Antibody Fragment Libraries into Antibody-Like Reagent Libraries**		
Presenter:	Adan Medina		
Mentor:	Professor Karl Dane Wittrup		**Honors** No
Authors:	Adan Medina, James A Van Deventer, K.D. Wittrup		
Presentation Type:	Poster	**College and Major:**	Molecular, Cellular, and Chemical Biology
Category:	Molecular, Cellular, and Chemical Biology		

Many applications in basic science, diagnostics, and therapeutics rely on the use of antibodies or antibody-like reagents. Antibody fragments (scFv) are central to many applications in the health sciences and are very easy to work with, but are not effective reagents for research without the corresponding constant region (Fc) of the antibody. Additionally, the process of isolating high-quality antibodies is very challenging and is often limited to experts. Therefore, having access to a system capable converting antibody fragments to antibody-like reagents (scFv-Fc) is necessary for their ubiquitous adoption in research laboratories.

In this work, we focus on converting scFvs to scFv-Fcs in a yeast-based system suitable for the cell surface display and secretion of antibody-like reagents of interest. The DNA manipulation techniques of yeast were used to fuse scFv encoding DNA with Fc encoding DNA, giving yeast the ability to produce scFv-Fc fusion proteins. Lysosyme-binding and Human neonatal Fc-receptor (FcRn)-binding scFvs were used as the template DNA. Yeast surface display, immunoblots, and magnetic bead experiments were used to test for display and secretion of full-length, functional scFv-Fcs.

Yeast surface display experiments indicate that comparable levels of scFv and scFv-Fc can be displayed on the yeast surface, while binding experiments indicate that scFvs are better binders then their scFv-Fc counterparts. Experiments investigating the secretion of full-length scFv-Fcs were performed, but the results were inconclusive.

Presentation Number P-65

ABSTRACT:

Abstract Title:	**Phenotypic Effects of a Mutation at a Pair of Conserved Aromatic Residues in the Yeast Histone Chaperone Protein VPS75**		
Presenter:	Zeta Mui		
Mentor:	McKenna Kyriss		**Honors** No
Authors:	Zeta Mui, McKenna Kyriss		
Presentation Type:	Poster	**College and Major:**	Veterinary Medicine: Biochemistry / Genetics
Category:	Molecular, Cellular, and Chemical Biology		

Eukaryotes pack their DNA into a structure known as chromatin, which is made up of DNA organized into nucleosomes and various associated scaffolding proteins. Nucleosomes are the basic building blocks of chromatin and are made up of ~147bp of DNA wrapped around a histone protein octamer, containing one histone H3-H4 tetramer and two histone H2A-H2B dimers. Histone chaperones are important proteins that facilitate and coordinate the assembly and disassembly of these nucleosomes. The rearrangement and remodeling of nucleosomes are of great importance in processes such as DNA replication, transcription and repair, because the associated protein machinery must be able to access the packed DNA during these processes. VPS75 is a histone chaperone in baker's yeast (*Saccharomyces cerevisiae*) that is known to interact with the histone H3-H4 tetramer, RNA polymerase II and the histone acetyltransferase Rtt109. These interactions function to coordinate nucleosome assembly, disassembly and play a role in DNA repair. To locate a prospective site of importance on VPS75 that might be involved in these interactions, we carried out protein multiple sequence alignments with proteins of other fungal species and higher eukaryotes. Multiple sequence alignments revealed a pair of conserved adjacent aromatic residues, tryptophan 181 (W181) and phenylalanine 182 (F182), which implies structural or functional importance. Structural visualizations using PyMOL software confirmed that W181 and F182 are surface exposed residues of the VPS75 protein, suggesting that they might play a functional role in the interactions of VPS75 with its targets. To better understand how W181 and F182 of VPS75 are important for interaction with its targets, we performed site-directed mutagenesis to change the two aromatic residues to two alanines (W181A F182A). We hypothesize that these mutations may disrupt VPS75-target interactions, which could lead to possible phenotypes such as sensitivity to heat, cold, DMSO (dimethyl sulfoxide), acetic acid, sodium chloride, and DNA damaging agents/DNA replication blockers. *S. cerevisiae* cells containing mutant or non-mutant VPS75 proteins will be assayed to determine their response to these conditions.

Presentation Number P-66

ABSTRACT:

Abstract Title:	**Dysregulation of the Dynorphin/Kappa-Opioid Receptor System Promotes Withdrawal-Induced Negative Affect**			
Presenter:	Molly McGinnis			
Mentor:	Brendan Walker			**Honors** No
Authors:	Molly McGinnis			
Presentation Type:	Poster	**College and Major:**	Veterinary Medicine: Neuroscience Arts and Sciences: Psychology	
Category:	Organismal, Population, Ecological, and Evolutionary Biology			

Alcohol use disorders (AUDs) impact approximately 18 million people in the United States and are comorbid with negative affective disorders such as depression and anxiety. Negative affective-like behavior is one characteristic of withdrawal from alcohol in dependent populations. A key element to this behavioral state is activation of kappa opioid receptors (KOR, for which dynorphin (DYN) is the endogenous ligand) that have been shown to drive excessive alcohol seeking and consumption and promote depressive-like behaviors during withdrawal. Infusions of a KOR antagonist, such as nor-BNI, have been shown to selectively attenuate escalated alcohol self-administration in dependent animals, with no effect in non-dependent animals. The purpose of this study was to further understand the role of the DYN/KOR system in alcohol withdrawal and how this system relates to abuse and dependence. To test the hypothesis that the DYN/KOR system is dysregulated by alcohol dependence and contributes to the expression of negative affect-like phenotypes during withdrawal, male Wistar rats had bilateral guide cannulae implanted into the lateral ventricles and were exposed to intermittent alcohol vapor to induce dependence. Subsequent to the dependence induction phase and following infusion of a KOR antagonist into the lateral ventricles, 22-kHz ultrasonic vocalizations (USVs) were measured as an ethologically valid index of a negative affect. The results indicate that alcohol withdrawal-induced negative affect is KOR-sensitive, as nor-BNI successfully attenuated the increased number of USVs associated with acute alcohol withdrawal in dependent animals in a dose dependent manner. This study implicates that targeting the DYN/KOR system may contribute to the development of effective treatments for AUDs.

Presentation Number P-67

ABSTRACT:

Abstract Title:	**Neutral Red as a Redox Mediator in Bioelectrochemical Systems**			
Presenter:	Abdelrhman Mohamed			
Mentor:	Haluk Beyenal			**Honors** Yes
Authors:	Abdelrhman Mohamed, Timothy Harrington, and Haluk Beyenal			
Presentation Type:	Poster	**College and Major:**	Engineering and Architecture: Bioengineering	
Category:	Engineering and Physical Sciences			

Microbial catabolism involves a cascade of enzymatic reduction/oxidization (redox) reactions that allow cells to harvest the chemical energy of organic substrates. Cells use redox enzymes - enzymes that transfer electrons from one substrate to another – often involving a coenzyme - to control the reaction cascade. Nicotinamide adenine dinucleotide (NAD^+) is an example of a redox coenzyme. NAD^+ acts as an oxidization agent by accepting electrons from other molecules and becoming reduced. Accordingly, the reduced form (NADH) acts as a reducing agent by donating electrons and becoming oxidized.

The energy generated from the enzymatic reduction/oxidization reactions allows the cells to grow, divide and produce metabolic products. Some microorganisms are known to produce valuable metabolites (e.g. ethanol, biofuels) as a by-product of their growth. The goal of metabolic engineering is to design processes that optimize the productivity (rate and yield) of valuable metabolites. One approach to optimize productivity is to control the ratio of $NADH/NAD^+$. Continuous reduction of NAD^+, or continuous oxidization of NADH, in a bioelectrochemical system can be used to control the rate of a specific reaction cycle as per Le Chatelier's principle.

Neutral red electrodes have been to electrochemically influence the $NADH/NAD^+$ ratio in solution.[1] The utilization of reduced neutral red for energy by bacterial cells has also been reported in the literature. *Escherichia Coli* reduces neutral red, while *Actinobacillus Succinogenes* oxidizes electrically reduced neutral red. Several attempts -including our own- to use neutral red to increase the production rate of ethanol using *Zymomonas Mobilis* did not produce significant results. We hypothesize that neutral red interacts enzymatically with NAD+/NADH across the cellular membrane through hydrogenases. Type I NADH Dehydrogenase, an enzyme expressed in both *Escherichia Coli* and *Actinobacillus Succinogenes* but not in *Zymomonas Mobilis*, is believed to facilitate the interaction of Neutral red with NAD^+/NADH. In order to test this hypothesis, our future research will focus on observing the interaction of neutral red with several bacterial strains where closely related Type I NADH Dehydrogenases are expressed.

[1] A. A. Karyakin, O. A. Bobrova, E. E. Karyakina, J. Electroanal. Chem. 1995, 399, 179.

Presentation Number P-68

ABSTRACT:

Abstract Title:	**The Tangibility of Death**		
Presenter:	Athena Lemon		
Mentor:	Pamela Lee		**Honors** Yes
Authors:	Athena Lemon		
Presentation Type:	Poster	**College and Major:**	Veterinary Medicine: Microbiology
Category:	Arts and Design		

In a portrait, the artist must capture the essence of the sitter on a canvas, a permanent reminder of the sitter at that time. In the creation of art, especially with painting or drawing, the final product always includes the artist's opinion or impression of the sitter. In the case of self-portraits, the artist analyzes herself and is given free liberty with her appearance and portrait. Helene Schjerfbeck, a Finnish painter, thought that those "who prettify themselves are boring," and separated herself from this group by looking critically at her own character, and developed a technique to show the mind of the sitter. This paper examines the series of self-portraits Schjerfbeck produced over her lifetime and identifies the themes of humanity that she experienced during each period of her life. These themes are reflected in how she represents herself on the canvas. Schjerfbeck's work is a reminder that we are not how we seem. In the later years of her life, photographs show that she looked nothing like her self-portraits. Many other artists would have tried to replicate the person in the photograph, but Schjerfbeck was able to reconcile and understand her own emotions towards her death, and express that on the canvas. Her technique makes the viewer focus on the emotion being expressed by her self-portraits, forcing us to feel as she did. She revolutionized the idea of art by incorporating her mind into her work. The process of dying strips us of our humanity and personality. Although it is strange and terrifying while it is happening, it is tangible enough to be expressed on canvas, and shared with others.

Presentation Number P-69

ABSTRACT:

Abstract Title:	**Site Directed Mutagenesis (E366W) of Yeast Juggler Protein Nap1**			
Presenter:	Deepak Nankani			
Mentor:	Dr. McKenna Kyriss			**Honors** No
Authors:	Deepak Nankani, Dr. McKenna Kyriss			
Presentation Type:	Poster	**College and Major:**	Veterinary Medicine: Genetics & Cell Biology	
Category:	Molecular, Cellular, and Chemical Biology			

The genomic DNA of a eukaryotic organism is highly condensed in the nucleus of the cell, and is called the chromatin. The chromatin is formed with the help of histone proteins which help in compaction of the DNA by forming octameric structures called nucleosomes. The highly compact structure of the chromatin blocks various interactions with the DNA, thus the maintenance of these structures is highly important in a eukaryotic cell. Proteins that help facilitate the interactions with condensed DNA and also support nucleosomal maintenance by interacting with the histone proteins are called histone chaperones.

The nucleosome assembly protein (Nap1) is a histone chaperone that exhibits a variety of functions in the cell. It is found in multiple eukaryotic species and has a highly conserved structure as well as functions. Its roles range from assembly and disassembly of nucleosome particles, to interactions with chromatin remodeling proteins, to presumed roles in transcription and nuclear transport. This protein without doubt acts as an important juggler protein with multiple functions across the cell.

In this study, we are working with baker's yeast, *Saccharomyces cerevisiae*, in order to better understand the importance of the Nap1 protein. We began by conducting a bioinformatic analysis of yeast Nap1 to identify potentially functional amino acid residues based on comparisons with Nap1 proteins from different species. As a result of this analysis, we chose to mutate glutamic acid 366 to tryptophan (E366W) because this residue was found on the edge of the protein structure, where interactions with other proteins are possible. This residue was also found to be highly conserved across many eukaryotic species, and the difference in size and charge between glutamic acid and tryptophan made this an intriguing mutation.

The effects of this mutation will be analyzed by comparing certain physical characteristics of the yeast cells containing the mutant Nap1 with those containing the non-mutant Nap1. This will help us determine the importance of glutamic acid 366 in Nap1, and also to study the importance of a specific structural region of the Nap1 protein with respect to its structural integrity and functionality in *Saccharomyces cerevisiae*.

Presentation Number P-70

ABSTRACT:

Abstract Title:	**First-Generation Mexican-American College Students: Familial Educational Involvement and College-Going**			
Presenter:	Rosalinda Godinez			
Mentor:	Dr. Monica Kirkpatrick Johnson			**Honors** No
Authors:	Rosalinda Godinez			
Presentation Type:	Poster	**College and Major:**	Arts and Sciences: Sociology	
Category:	Social Sciences			

The low educational attainment of students of Mexican origin in the United States is a growing concern. Research identifies parental involvement (PI) as an important asset to students' success and defines it as the direct parental involvement with schools. Little research addresses the ways Mexican parent's help their children succeed, however. To address this gap, this research attempts to understand Mexican parents' involvement and other factors first year Mexican-American college students perceived as important in shaping their educational success. Semi-structured interviews were conducted with 17 college freshman who identified themselves as Mexican, first-generation, low-income, and migrant/seasonal farmworker background. Findings indicate that Mexican parents are involved in their children's education, but in ways other than traditionally defined. Instead, a number of the students identify receiving direct involvement that meets the standard definition of PI from an educational program or individual.

Presentation Number P-71

ABSTRACT:

Abstract Title:	**A Third Generation of Friendship?**		
Presenter:	Jackie Hill		
Mentor:	Lydia Gerber		**Honors** No
Authors:	Jackie Hill		
Presentation Type:	Poster	**College and Major:**	Arts and Sciences: Chinese
Category:	Humanities		

Among current threats to global stability, the actions of the North Korean regime loom large. This project focuses on the relationship between China and the Democratic People's Republic of Korea and questions what the transfer of power in Pyongyang to the third generation of the Kim family will mean for the future relationship between the two states, and the stability of the region. It is an ongoing project since this issue evolves over time, especially with recent nuclear tests and repatriation of North Korean refugees in China. An analysis of the complex relationships between China and the two Koreas, and of China's response to North Korea's behavior and provocations in the past, based on recent scholarly articles and publications was performed to identify China's goals for its relationship with North Korea and potentially changing trends in its response to its frequently rogue neighbor. This analysis suggests that China's main goal is to maintain peace and stability in the region in order to safeguard its own continued economic growth. Accordingly, Beijing does not wish for regime change in North Korea, only for the regime to change and, in particular, to adopt economic reforms. China attempts to influence decisions in Pyongyang through demonstrating the success of reforms that China has enacted, such as the construction of special economic zones. Beijing sees respecting Pyongyang's sovereignty and not interfering in internal affairs as more important than pressing its neighbor to engage in much-needed reform. Unless the current leader's policies deviate significantly from his predecessor, the transfer to the next generation of the Kim family is unlikely to impact these attitudes, as China's interests remain largely unchanged. Based on China's past interactions with the regime, economic ties, diplomatic relationships in the region and decisions during the nuclear crises, it seems likely that China will continue to be close the North Korean regime, rather than calling for drastic changes. In examining this issue from the perspective of the Chinese government and its goals, this project contributes to our understanding of a complex global challenge.

Presentation Number P-72

ABSTRACT:

Abstract Title:	**A Meta-Analysis of BPD and Facial Affect Recognition**			
Presenter:	Sabrina Gonzales			
Mentor:	Lisa Fournier			**Honors** Yes
Authors:	Sabrina Gonzales			
Presentation Type:	Poster	**College and Major:**	Arts and Sciences: Psychology	
Category:	Social Sciences			

Borderline Personality Disorder is characterized by severe impairments in emotion regulation, affective instability, identity problems, and unstable interpersonal relationships. Previous research has suggested that impaired recognition of facial affect may contribute to disturbed social relations in BPD. This meta-analysis examined the association between Borderline Personality Disorder (BPD) and facial emotion recognition. Twenty studies published between 1999 and 2012 were included. All included studies used behavioral tasks, which presented pictures of the basic facial emotions (e.g. happy, sad, angry, disgust, surprise). Participants were instructed to identify the facial expressions in a variety of behavioral tasks in order assess differences in facial affect recognition between individuals diagnosed with BPD or high in BPD traits and healthy controls. Accuracy scores were converted to appropriate effect size scores. There was an association between BPD and lower accuracy rates in recognizing facial affect. The inability to recognize basic facial emotions has significant implications for BPD and the realities of functioning effectively in social contexts.

Presentation Number P-73

ABSTRACT:

Abstract Title:	**Head and Neck Posture During Tablet PC Use**		
Presenter:	Steven Monda		
Mentor:	Dr. Anita Vasavada		**Honors** No
Authors:	Steven Monda, Derek Nevins, David Lin, Anita Vasavada		
Presentation Type:	Poster	**College and Major:**	Engineering and Architecture: Bioengineering
Category:	Engineering and Physical Sciences		

Tablet PC is associated with neck pain due to the flexed position users often adopt during use. The goal of this study was to quantify the head and neck postures adopted while participants used tablet PCs in different usage conditions. Photographs were taken of people using an iPad during reading and writing tasks in different Tablet PC positions. The head, neck, and trunk angle were calculated from these photographs. These angles were compared to the subject's neutral posture in order to see how flexed a person is in that particular task. These results may be used for recommendations on tablet PC use that promotes better ergonomics.

Presentation Number P-74

ABSTRACT:

Abstract Title:	**Creating Barcodes for Shapes**			
Presenter:	Joshua Cruz			
Mentor:	Bala Krishnamoorthy			**Honors** Yes
Authors:	Cruz, J., Krishnamoorthy, B., Vixie, K.			
Presentation Type:	Poster	**College and Major:**	Arts and Sciences: Mathematics	
Category:	Computer Science, Mathematics, Statistics, and Information Sciences			

The problems of shape recognition, sorting, and compression arise in applications as varied as facial recognition and computational geography. For example, keeping track of every single shape every analyzed could be tiresome and impractical, but it is still desirable to match a given shape with one similar to it. One way to do this is to assign a signature to the shape like stores assign barcodes to merchandise: instead of dealing with the actual object, the signature acts as a shortcut.

We can create our version of a signature based on curvature and topology. We gradually smooth the parts of the shape that have the most curvature. At each step, we look at the topology of the part of the shape we took out, e.g. how many connected parts it has or how many holes or voids each has. We track the changes to the topology as we get stricter and stricter on how much curvature we're allowed to keep until the entire shape is eventually taken away. We use this information to create a barcode, or a set (with multiplicity) of intervals. We use this barcode as the signature. We define a distance between barcodes, which gives us distances between shapes. This distance is what allows us to solve problems of shape recognition and sorting. Because the barcodes are just a collection of intervals, it also takes much less information to store than the original shapes. We demonstrate the procedure on several 2-dimensional and 3-dimensional shapes.

Presentation Number P-75

ABSTRACT:

Abstract Title:	**German Reproductive Policy: The role of Institutions in the Symbolic Pre-Adoptive Outcome of the 1992 Abortion Act**			
Presenter:	Nikkole Hughes			
Mentor:	Dr. Amy Mazur			**Honors** Yes
Authors:	Hughes, Nikkole A.			
Presentation Type:	Poster	**College and Major:**	Agricultural, Human, and Natural Resource Sciences: Natural Resource Policy / CAS: Political Science	
Category:	Social Sciences			

Struggles to reform Germany's abortion law, Section 218 of the *Strafgesetzbuch* (StGB, the Criminal Code), have been the centerpiece of German feminist action since the 1970s. Following the fall of the Berlin Wall in 1989, the question of abortion's legality and criminal status became an integral component of discussions surrounding political reunification of East and West Germany. At the core of the abortion debate were two models of abortion policy: an "indications" model, which aimed to restrict abortion access to a few set conditions or indications, and a "period" model, which sought to permit abortions through the first trimester of pregnancy. This paper deconstructs the individual variables influencing the problem definition, agenda setting, and proposal generation stages of the 1992 Abortion Act, which amended Section 218 of the Criminal Code, in order to answer the question, "Did institutions matter in the policy outcome?" Analysis is conducted through a feminist public policy analytical framework in order to determine whether or not the policy process resulted in a substantively feminist (authoritative) outcome, rather than a non-feminist (symbolic) one. My central argument is that these stages of the policy process promoted a more conservative, and therefore symbolic, approach to reproductive policy. Evaluation of nine policy input variables—politics, socioeconomic conditions, culture, political culture, extra-national influences, public opinion and media, policy entrepreneurs, and institutions—supports this argument. By focusing on the discrete factors contributing to the formulation of Germany's reformed abortion policy, I further reveal that institutions mattered more than any other variable in making the pre-adoptive outcome symbolic.

Presentation Number P-76

ABSTRACT:

Abstract Title:	**Quantification of Lactic Acid in Chicken Cecal Samples**			
Presenter:	Ross Overacker			
Mentor:	Dr. Jeremy Lessmann			**Honors** No
Authors:	Overacker, Ross			
Presentation Type:	Poster	**College and Major:**	Arts and Sciences: Chemistry	
Category:	Molecular, Cellular, and Chemical Biology			

The main goal throughout the summer was to prepare for sample quantification using the high performance liquid chromatography. This was accomplished and we are now ready to receive samples and begin quantifying them for their lactic acid concentrations.

The mobile phase that was used was a 0.1 M solution of Na_2SO_4 adjusted to pH 2.65 with methanesulfonic acid. This was picked in order to match that of the inspection report that came with the column we purchased for this research, which was an Acclaim Organic Acid 5mm 120Å, 4.0x250mm column. I compared the results of the inspection report to the spectra of lactic acid and citric acid that were found experimentally. With the peaks matching up to the inspection report it was determined that the column and HPLC was working correctly and as intended.

Once the broth solution was received we began running samples of it through the HPLC using the same mobile phase as found earlier in the summer. The broth solution revealed a long, messy spectrum, which made it harder to visualize the intended lactic acid peak. Several attempts were made at clearing up the spectrum, which did not work Diluting the broth was found to be the best method to reduce the peaks so that lactic acid would be more visible. The second problem we had was that it took too long for all of the peaks of the broth to come off of the column, over thirty minutes. In order to reduce this time a gradient solvent system was introduced. Using a mixture of the normal mobile phase and Acetonitrile we were able to reduce the time from 30 plus minutes to less than 20 minutes.

The aim has been to prepare an accurate calibration curve using known concentrations of lactic acid in the broth solution. This was accomplished by making a 1000, 500, 250, 125, and 62.5 ppm solutions. Each solution was then run 4 times and a calibration curve made.

Presentation Number P-77

ABSTRACT:

Abstract Title:	**Dynamic Cryogenic Seals to Support the Fueling of Fusion Tokomaks**		
Presenter:	Uriel Naranjo		
Mentor:	Jacob Leachman		**Honors** No
Authors:	U. Naranjo, J. W. Leachman, and J. T. Fisher		
Presentation Type:	Poster	**College and Major:**	Engineering and Architecture: Mechanical Engineering
Category:	Engineering and Physical Sciences		

Sealing failures have the potential to damage products and render them useless as well as put people's lives at stake, so it is important to stop leaks. Sealing at cryogenic temperatures is a substantially more difficult task than sealing at room temperature since materials tend to shrink, become brittle, and crack. We have the goal of creating a dynamic, cryogenic seal to incorporate into a prototype hydrogen extruder at WSU in order to vary the flow restriction in the extruder in a efficient manner. This seal will substantially reduce the time it takes to gather data that would otherwise require several days between adjustments and measurements. Fabricated from polymers similar to Teflon, dynamic cryogenic seals will be used to seal a titanium shaft on the prototype hydrogen extruder. The efficiency of the seal is measured via helium leak testing with a Pfeiffer ASM Graph D leak detector. The measured leak rates and turning torques are provided for the test seal configurations. Knowledge from the seal on this extruder will, in turn, be used to develop fueling systems for fusion reactors such as the ITER tokomak.

Presentation Number P-78

ABSTRACT:

Abstract Title:	**Documenting Domestic Lineages in the American Southwest: Turkeys (Meleagris gallopavo) and Dogs (Canis lupus)**			
Presenter:	Kathleen Judd			
Mentor:	Brian Kemp			**Honors** No
Authors:	Connor Cordray, Erin Reams, Rebecca Higgins, Timothy Kohler, Brian Kemp			
Presentation Type:	Poster	**College and Major:**	Veterinary Medicine: Genetics and Cell Biology	
Category:	Social Sciences			

In this study, we analyzed ancient mitochondrial DNA from the remains of turkeys (*Meleagris gallopavo*) and dogs (*Canis lupus*) to document domestic lineages maintained and managed by prehistoric Puebloan groups. The initial goal of this project is to determine the amount of regional genetic substructure that existed among populations of these species in the northern Southwest. This information is used to evaluate how useful turkey and/or dog genetic lineages are as proxies for human interactions and/or migrations. If sufficient variation and structure is exhibited by these domestic species, their continued study will be important for evaluating various hypotheses about human population prehistory, particularly when human skeletal remains themselves are unavailable for genetic analysis. The data generated in this preliminary study are cast in light of Pueblo depopulation of the Mesa Verde region and their hypothesized movement to the Northern Rio Grande region.

Presentation Number P-79

ABSTRACT:

Abstract Title:	**Catalytic Reforming of Jet-A and Methyl Oleate Transportation Fuels**			
Presenter:	Craig Owen			
Mentor:	Grant Norton, Su Ha			**Honors** No
Authors:	Craig Daniel Owen; Christian Martin Cuba Torres; Su Ha; M. Grant Norton			
Presentation Type:	Poster	**College and Major:**	Engineering and Architecture: Materials Science and Engineering	
Category:	Engineering and Physical Sciences			

Hydrogen is a key component in the future of green and efficient technologies. For instance, hydrogen-based fuel cells can be employed as high efficiency engines emitting less polluting gases than traditional combustion methods with a more efficient fuel use. Despite advancements in fuel cell technology that show promise in replacing internal combustion engines, hydrogen generation is still a critical step in the overall system. For this application, a catalytic material should facilitate complex fuel reforming of readily available transportation fuels (e.g., gasoline, jet fuel, etc) into synthesis gas (H_2 and CO) especially for onboard mobile applications (such as airplanes, cars, and ships.).

Transportation fossil fuels and energy conscience biofuels such as biodiesel are complex fuels that are critical targets for mobile applications of hydrogen generation. Reforming these fuels would not only take advantage of the current fuel distribution infrastructure, but would also provide a proficient use of the fuels if employed in a fuel cell system pre-fed by an external reformer. Nevertheless, current catalysts for fuel reforming such as Pt, Pd, and Rh are not cost effective, and nickel-based catalysts quickly deactivate due to coking, sintering, and sulfur poisoning.

This work focuses on MoO_2 and Mo_2C as catalysts for reforming readily available complex transportation fuels, where current literature is still limited, through two different methods: using $(NH_4)_6Mo_7O_{24}.4H_2O$ as a precursor, and from a hydrothermal formation. The latter method uses only hydrothermally formed MoO_2 as the sole precursor without the need of hydrogen feedstock, whereas hydrogen gas is required using a $(NH_4)_6Mo_7O_{24}.4H_2O$ precursor; storage of which is a primary safety concern for onboard mobile applications. Initial data has been collected showing promising stability of both catalysts for long-term reforming; conversion percentages ranging from 90-100% for more than six hours.

Presentation Number P-80

ABSTRACT:

Abstract Title:	**Colorado Potato Beetle Vitality Against Pathogens After Exposure to Predators**		
Presenter:	Christina (Tina) Miller		
Mentor:	David Crowder		**Honors** Yes
Authors:	Christina Miller		
Presentation Type:	Poster	**College and Major:**	Arts and Sciences: Zoology
Category:	Organismal, Population, Ecological, and Evolutionary Biology		

Mitigating species number (richness) and the relative abundance of species (evenness) has shown to be useful in controlling crop damage from pests. Organic farms often have a high density of predators and pathogens. Since predator and pathogen exposure has been found to weaken the immune response in Colorado potato beetles (CPB), which are key pest in Washington potato farms, we investigate a better way to control pests naturally by testing whether the combined effect of predator and pathogen exposure is greater than each acting individually. Our research included a series of corresponding laboratory and field experiments using a combination of predators (nabids and lady beetles) and pathogens (fungi and nematodes) to determine whether they act in a complementary way to control CPB. Our results showed that the combined effect of predators with pathogens lowers the survival rate of CPB, suggesting that farming **practices may be enhanced by ensuring healthy populations of these** two groups of natural enemies to pests like CPB.

Presentation Number P-81

ABSTRACT:

Abstract Title:	**G-actin Polymerization and Interaction with Tropomodulin 2**		
Presenter:	Kang Pan		
Mentor:	Alla S. Kostyukova		**Honors** No
Authors:	Alla S. Kostyukova; Natalia Moroz		
Presentation Type:	Poster	**College and Major:**	Engineering and Architecture: Bioengineering
Category:	Molecular, Cellular, and Chemical Biology		

The abilities and variations of wild-type Tropomodulin 2 and c-truncated Tropomodulin 2 bind to the pointed (barbed) end of G-actin filaments is the main study in my research. Tropomodulin 2 is a member in the Tropomodulin protein family found in neuron cells, which binds and caps the pointed end of actin along with tropomyosin, in order to lengthen or shorten the actin monomers. G-actin is a free monomer microfilament in the actin group. The experiment is performed by polymerizing G-actin along with pyrene-actin and Tropomodulin 2 with varied mutations and concentrations in polymerization buffer, and measuring the fluorescence level to determine the ability of binding. Prior to the polymerization, wild-type Tropomodulin 2 and c-truncated Tropmodulin 2 are purified using Ni-NTA column method and are kept in Tris-HCl buffer with DTT and EDTA. Concentrations of the two proteins are also measured by spectrometer. Polymerization occurs quickly after polymerization buffer is added to the protein and actin samples. Therefore, within approximate one minute time period, all samples are loaded in the cuvettes and data is collected immediately after loading. The graph of the data includes three phases: lag phase, where the actin molecules start to flow and bind to each other; exponential growth phase, where enough molecule bindings occur and that triggers polymerization, fluorescence level then increases sharply like exponential; steady-state phase, where the polymerization becomes steady. At this stage of the experiment, it suggests that the protein and actin stabilities and activities are important for the entire experiment performance, as well as the nucleation. The experiment is an ongoing and continuous project which means, that the results are expected to be shown in late February or early March. The results will lead to a better understanding of polymerization of G-actin as well as the impacts on binding activities and behaviors due to the different types of protein, wild type Tropomodulin 2 and c-truncated Tropomodulin 2 to G-actin.

Presentation Number P-82

ABSTRACT:

Abstract Title:	**Chinese Historiography: A Clash of East and West**		
Presenter:	Matthew Kenyon		
Mentor:	Lydia Gerber		**Honors** No
Authors:	Matthew Kenyon		
Presentation Type:	Poster	**College and Major:**	Arts and Sciences: History
Category:	Social Sciences		

This work investigates the complex nature of Chinese historiography as it has developed through the 20th century, suggesting that the contemporary Chinese approach towards historiography has developed from three key realms of influence: self-referential historiography, historiography as a reaction to western academia, and conflicts arising between Chinese, South Korean, and Japanese accounts of "historically sensitive" events. Altogether, these realms of influence are the driving force behind an attempt by Chinese historians to develop a new, non-Eurocentric approach to world history, or "world history with Chinese characteristics". This piece further examines how Chinese historiography was influenced by developments within the 20th century: first, a desire to emulate western academic attempts to develop a scientific approach to history; second, an attempt by the Chinese Communist Party to interpret world history through Marxist ideology; and third, recent attempts to synthesize the two approaches and yet still retain a uniquely Chinese character. By drawing upon sources from China, its neighbors, and the West, the author argues that modern Chinese historiography attempts to control the discourse of history as a means of legitimizing the ruling Communist Party, while still trying to prevent itself from being received as simply another form of propaganda. The end result is a unique approach to world history embracing both western academic standards and eastern ideological concerns. This paper contributes to our understanding of the interplay between historiography as an academic discipline and as a political tool, a means of conferring and reinforcing legitimacy.

Presentation Number P-83

ABSTRACT:

Abstract Title:	**Synthesis and Characterization of Nano Particle Oxide Catalyst**		
Presenter:	Serah Njau		
Mentor:	Dr.M Grant Norton		**Honors** No
Authors:	Serah Wambui Njau		
Presentation Type:	Poster	**College and Major:**	Engineering and Architecture: Chemical Engineering
Category:	Engineering and Physical Sciences		

A more electric airplane (MEA) development will be a great innovation in the field of aviation because it will increase fuel efficiency and reduce the weight of commercial airplanes. Solid oxide fuel cells are an important part in achieving this goal. We need to develop an alternative anode material for the solid oxide fuel cell that will allow internal reforming of complex aviation fuels, including biofuels.Nanosized molybdenum dioxide (MoO_2) is a highly promising alternative to expensive noble metals for the internal reforming anode of direct Jet-A SOFCs. MoO_2 has high catalytic activity towards reforming liquid hydrocarbon fuels and resistance towards coking and high sulfur tolerance. The only drawback of using MoO_2 is that it has limited phase stability under a partial oxidation reforming environment. The goal of my research is to stabilize the MoO_2 phase by doping it with Ti^{4+} ions, which can stabilize the lattice oxygen therefore improving an overall phase stability of the MoO_2.

Presentation Number P-84

ABSTRACT:

Abstract Title:	**Funcitional Analysis of E2A and HEB in Female Reproduction**		
Presenter:	Michele Reinelt		
Mentor:	James Pru		**Honors** Yes
Authors:	Michele Reinelt, Cindy Pru, Melissa Oatley, Jon Oatley, James Pru		
Presentation Type:	Poster	**College and Major:**	Agricultural, Human, and Natural Resource Sciences: Animal Science
Category:	Molecular, Cellular, and Chemical Biology		

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-proteins form homo and heterodimers in different combinations to regulate gene transcription of differentiation genes. Given that the female reproductive system retains developmental vestiges in adult life, the objective of this study was to determine if two E-protein genes, E2A and HEB, are essential for female fertility. To study the function of E2A and HEB in fertility, transgenic mice were generated in which both E2A and HEB were targeted for conditional deletion. This was accomplished using a Cre-loxP strategy in which deletion of each gene was controlled by a tissue-specified cre recombinase. Three different tissue-specific cre recombinase expressing mice were used. The first was with the progesterone receptor (Pgr-cre) which targeted cells of the pituitary, ovary and uterus for E2A/HEB deletion. Second was with anti-Mullerian hormone (Amh-cre) which confers cre recombinase expression in the ovarian granulosa cells in early follicular development. The third was anti-Mullerian hormone type 2 receptor (Amhr2-cre), which deleted HEB and E2A in mesenchymal tissue of the female reproductive tract during embryonic development. Ovaries collected from adult Pgr-cre females lacking both E2A and HEB (dcKO) showed a marked decrease in size, as well as a complete absence of corpora lutea and large pre-ovulatory follicles. This phenotype is consistent with mutant mice that lack the follicle stimulating hormone gene, suggesting a role for E2A/HEB in pituitary function. The Amh-cre dcKO females showed a reduction in mature antral follicle formation. Preliminary data from our breeding trial suggests that E2A and HEB are required for normal fertility. Amhr2-cre animals displayed a decrease in the number of pups per litter for heterozygotic females who lacked only one allele for each of the transcription factors. Collectively, these data provide evidence that E2A and HEB do indeed play a fundamental role in female fertility.

Presentation Number P-85

ABSTRACT:

Abstract Title:	**Growth and Properties of Various Carbon Nanotube Arrays**		
Presenter:	Kassiopeia Smith		
Mentor:	David Bahr		**Honors** No
Authors:	Kassiopeia Smith		
Presentation Type:	Poster	**College and Major:**	Engineering and Architecture: Material Science and Engineering
Category:	Engineering and Physical Sciences		

Carbon nanotubes (CNT's) have been found to hold a wide spectrum of outstanding properties. These properties include high thermal and electrical conductivity and incredible strength. However, the while individual tubes may be exemplary, an assembly of tubes in an array may have very different properties based on the architecture of the array. These arrays are usually grown using chemical vapor deposition (CVD).

Three common arrays of CNTs are the "forests", "turfs", and "mats", where forests are primarily vertical, turfs are nominally vertical, and mats are more randomly oriented relative to the growth surface. This study focuses on the differences in growth conditions that lead to mats versus turfs. CVD was used to grow CNT mats and we compared their physical structure to vertically aligned carbon nanotube turfs, including density, tube size, and orientation to the growth direction. Further comparison of the properties of the CNT mats and turfs was carried out using nanoindentation to compare the elastic properties of the two structures. The difference in vertical versus lateral tortuosity will be shown to be a primary consideration in the resulting properties of the turf.

Presentation Number P-86

ABSTRACT:

Abstract Title:	**In Vitro Fermentable Fiber in Byproducts Feeds**		
Presenter:	Brittany Gardner		
Mentor:	Mark Loge Nelson		**Honors** No
Authors:	Brittany Gardner, Mike Thonney, Mark Nelson		
Presentation Type:	Poster	**College and Major:**	Agricultural, Human, and Natural Resource Sciences: Animal Science
Category:	Applied Sciences		

An *in vitro* experiment was conducted to evaluate fermentable neutral detergent fiber (FNDF) content of alfalfa and byproduct feeds. Serum bottles (100 mL) were used as vessels for incubation of alfalfa, cotton seed hulls, soybean hulls and wheat middlings with a 4:1 mixture of McDougal's buffer to ruminal fluid in a completely randomized design with three replicates/ feedstuff. Bottles were flushed with CO_2, to displace O_2 and capped. Initial pressure was reduced to atmospheric pressure and the bottles were incubated at 39 C for 96 h. Gas production was measured using a pressure transducer at 6, 12, 24, 36, 48, 72 and 96 h, and neutral detergent fiber (NDF) substrate disappearance was measured at 48, 72 and 96 h. Soybean hulls and wheat middlings fermented very rapidly (Table 1), however, more gas was produced from soybean hulls, indicating that they were much more fermentable. Gas production generally reflected NDF digestibilities. For example, Soybean hull NDF and wheat middling NDF was dramatically more fermentable than the NDF in alfalfa. Cotton seed hull NDF was substantially less fermentable than the other three substrates ($P < 0.01$). These data show that the variability in fermentation of the dry matter was largely caused by variability in NDF fermentation.

Table 1. *In vitro* Gas Kinetics and Fiber Fermentability[a]

Ingredients	A	B	k	A + B, mL/g	NDF, %	FNDF, %
Alfalfa	-26.1591	347.5413	0.032908	321.3822	53.3	21.0
Cotton seed hulls	16.6567	-142.933	-0.00868	126.276	87.4	17.5
Soybean hulls	-101.985	654.1345	0.051342	552.1491	70	65.4
Wheat middlings	-85.0186	482.3569	0.069367	397.3383	40.5	27.2

[a]Cumulative gas production = A + B * (1-exp(-k*hours)) where A = initial gas production; A + B = potential gas production, mL/g DM; k = rate of gas production, h^{-1}; NDF = neutral detergent fiber; FNDF = fermentable neutral detergent fiber.

Presentation Number P-87

ABSTRACT:

Abstract Title:	**The Human Mutl Homologue Hmlh1: Missense Mutations and their Effects on DNA Double-Strand Break (DSB) Repair**		
Presenter:	Yixuan Ren		
Mentor:	Chengtao Her		**Honors** No
Authors:	Xixuan Ren		
Presentation Type:	Poster	**College and Major:**	Veterinary Medicine: Genetics and Cell Biology
Category:	Molecular, Cellular, and Chemical Biology		

Genomic instability is the major cause for all human cancers, and DNA repair gene mutations are the key underlying factors. For instance, mutations in the human DNA mismatch repair (MMR) gene hMLH1 are causally linked to the pathogenesis of Lynch syndrome (also referred to as hereditary nonpolyposis colorectal cancer). Mutations in hMLH1 occur in over 50% of Lynch syndrome patients, highlighting the importance of this gene in the tumorigenic process. However, it is largely unknown how exactly these mutations exert their pathogenic efforts. Here, we identified a new role for the hMLH1 gene in the process of DSB repair regulation, and this line of research is expected to provide a foundation for a better understanding of how hMLH1 mutations facilitate the development of cancer in Lynch syndrome patients. Briefly, this research is focuses on the effects of hMLH1 missense mutations on DSB-induced recombination. Since hyper-recombination in cells would be expected to increase genomic instability, we have tested several hMLH1 mutations in a newly developed recombination reporter system. The results are phenomenal; among nine missense mutations five displayed aberrant up-regulation of recombination activity. Two of the three tested missense mutations also up-regulate DSB-induced nonhomologous end-joining. Collectively, our current study has revealed a new role for hMLH1 in DSB repair, and most importantly our results provide a foundation for a better understanding of the pathogenic effects of hMLH1 missense mutations and it will also facilitate the development of more effective anti-cancer strategies.

Presentation Number P-88

ABSTRACT:

Abstract Title:	**Effect of Age on Maternal Care Behavior in the Eastern red-Backed Salamander (Plethodon Cinereus)**			
Presenter:	Jessica Graham			
Mentor:	Erica Crespi			**Honors** No
Authors:	Jessica L. Graham, Aurelia C. Kucera			
Presentation Type:	Poster	**College and Major:**	Arts and Sciences: Zoology and Agricultural, Human, And Natural Resource Sciences: Wildlife Ecology	
Category:	Organismal, Population, Ecological, and Evolutionary Biology			

An individual both increases their current reproductive success and decreases their chances of future reproductive success while engaging in parental care behavior. This and other life history tradeoffs are mediated by the neuroendocrine stress axis, which may become more or less sensitive depending on reproductive stage. To test the hypothesis that stress responsiveness is altered to maximize lifetime reproductive success, we investigated how brooding female red-backed salamanders (*Plethodon cinereus*) respond behaviorally to stressors and how this response varies with the age of both the individual and her eggs. These salamanders brood their eggs until hatching (~60 days), which is a highly costly behavior because females reduce foraging and experience increased risk of predation while guarding eggs.

We observed behavior when brooding females were exposed to a non-reproductive conspecific female intruder and used skeletochronology to estimate female age. Following life history theory, we predicted that older females will invest more in current parental care when faced with the stressor, because they have fewer opportunities for future reproduction. We expected that females with older eggs would also favor the current clutch, because their more developed eggs have higher reproductive value than potential future eggs. Specifically, older females and those with older eggs were expected to display more aggression toward the intruder.

Salamanders continue to grow throughout their lifetimes, but during the winter the growth rate slows. In the long bones this causes a visible area of reduced bone deposition called line of arrested growth (LAG), similar to annual rings in trees. We are in the process of collecting age data by staining humerus cross sections and counting LAGs under a high power microscope.

As predicted, we found that brooding females with older eggs were significantly more aggressive toward an intruder than those with younger eggs. These results provide support for our prediction that females with fewer future reproductive opportunities will behave more aggressively toward intruders, and suggest that behavioral response to a stressor is altered depending on the reproductive value of the current clutch, as predicted by life history theory.

Presentation Number P-89

ABSTRACT:

Abstract Title:	**Women Trafficking: Assessment of Traditional and Modern China**			
Presenter:	Olivia Lottes			
Mentor:	Dr. Lydia Gerber			**Honors** Yes
Olivia Lottes	Olivia Lottes			
Presentation Type:	Poster	**College and Major:**	AGRICULTURAL, HUMAN, AND NATURAL RESOURCE SCIENCES: Animal Science	
Category:	Social Sciences			

Trafficking of women has a long history in China. Before the 1950s, particularly the purchase of women as concubines was widely practiced and legal. In 1949, the new Communist government outlawed the practice of taking concubines and consequently abolished the laws and regulations governing related purchasing contracts. It was not until the 1980s that women trafficking emerged again in Chinese society as an unintended result of the One-Child-policy and Deng Xiaoping's economic reforms. This project compares women trafficking before the 1950s when the trade was legal to after the 1980s when the trading was illegal. It explores primary and secondary sources to examine how trafficking impacted the natal families of trafficked women in each time period. Secondly, this project analyzes traditional and current laws pertaining to women trafficking to assess in what, if any, way the interests of trafficked women are recognized. This study concludes that trafficked women and their natal families before the 1950s could reap some advantages from the trade, such as financial benefits, and also maintain contact. Today's trafficking, in contrast, only benefits the criminals specializing in this trade, and separates women from their natal families for life.

By offering a long-term perspective, and by contrasting legal and illegal women trafficking in Chinese history, this project highlights illegality as a contributing factor in further victimizing trafficked women. It contributes to a more complex understanding of the interplay of policy and social realities in China today.

Presentation Number P-90

ABSTRACT:

Abstract Title:	**Catalyzation of Biomass-Lignin to Jet fuel**		
Presenter:	Tyler Rexus		
Mentor:	Bin Yang		**Honors** No
Authors:	Libing Zhang, Dhrubojvoti Laskar, Bin Yang		
Presentation Type:	Poster	**College and Major:**	Agricultural, Human, and Natural Resource Sciences: Biochemistry
Category:	Molecular, Cellular, and Chemical Biology		

A key challenge in using lignin as a biofuel resource is its intrinsic complex cross linked polymeric structure. Flowthrough pretreatment has high potential to generate lignin rich streams and extractives from biomass which provides a flexible platform for producing high-value products. Water-only flowthrough pretreatment conditions with or without additives (0.05% and 0.1% H_2SO_4) have been employed under various reaction times and temperature conditions to achieve selective hydrolysis of C–O–C bonds and lignin cross-linkages for maximum removal of lignin from poplar biomass. This resulted in effective lignin release and allowed efficient solubilization of monomeric/oligomeric lignin in high yields in the hydrolyzates exiting the flow reactor. The solubility limits of lignin under the tested flowthrough pretreatment conditions were successfully determined by UV analysis. The characteristic features of dissolved reactive lignin intermediates compatible for catalytic conversion to jet fuel range hydrocarbons were explored. Understanding the reaction chemistry of lignin depolymerization and solubilization provided the fundamental basis to develop an efficient aqueous-phase catalytic hydrodeoxygenation (HDO) process of lignin to jet fuel range hydrocarbons. The overall strategies for such HDO process including: (i) substantial reduction of oxygen content from the dissolved lignin intermediates; and (ii) appropriate catalyst selection for high HDO yields for production of jet fuel range hydrocarbons, will be addressed in this study.

Presentation Number P-91

ABSTRACT:

Abstract Title:	**Effects of Framing on Ambiguous Risk Decision Making**			
Presenter:	Joelle Martin and Amy Nusbaum			
Mentor:	Paul Whitney, John Hinson			**Honors** No No
Authors:	Paul Whitney, John Hinson, Peter Rosen, Joelle Martin, Amy Nusbaum			
Presentation Type:	Poster	**College and Major:**	University College:Intended major, Biology- Pre Med Arts and Sciences: Psychology	
Category:	Social Sciences			

People's propensity for risk can be influenced by how the choices are presented to them. When faced with the choice between a sure gain and a gamble (positive frame), participants tend to be risk averse, but when faced with a choice between a sure loss and a gamble (negative frame) they tend to be risk seeking. This phenomenon is referred to as the framing effect. Past framing effect research has studied decision making in known risk situations, where the participant knows the exact probability of the possible gamble outcomes. In contrast, there is little information on the subject of ambiguous risk, where the gamble option is presented without the known probabilities and people have to learn the risks based on choice feedback. The current experiment used a framed gambling task to study ambiguous risky decision making. The choices were presented as either a sure loss or gain, pitted against either one of two decks of cards that provided gains of losses of hypothetical sums of money. One of the decks averaged losses that were greater than the sure loss, and the other deck averaged gains that were greater than the sure gain. Knowledge probes were used to measure explicit knowledge of task outcomes over trials. In addition, skin conductance recordings (SCRs) were used to assess affective reactions during decision making. The FGT results demonstrated that risk aversion in the negative frame was so strong that participants would choose a bad gamble over taking a sure loss. In the positive frame, participants often chose the sure gain over a good gamble. SCR data and knowledge probes both indicated that people were aware of the risks associated with the decks, but framing produced disadvantageous choices anyway.

Presentation Number P-92

ABSTRACT:

Abstract Title:	**Pretreatment with the Combination of Opioids Decrease the Development of Tolerance**		
Presenter:	Shauna Taff		
Mentor:	Michael Morgan		**Honors** No
Authors:	Shauna M. Taff, Erin N. Bobeck, and Michael M. Morgan		
Presentation Type:	Poster	**College and Major:**	Arts and Sciences: Psychology
Category:	Molecular, Cellular, and Chemical Biology		

Opioids, such as morphine and fentanyl, are commonly used to treat pain despite a range of side effects, including the development of tolerance with repeated administration. Although tolerance develops to all opioids, the lack of cross-tolerance between opioids suggests different tolerance mechanisms. Thus, combining opioids could enhance pain relief by limiting the development of tolerance. This study tested this hypothesis by measuring tolerance to the antinociceptive effect of microinjection a combination of morphine and fentanyl into the ventrolateral periaqueductal gray (vlPAG), a key brain region for opioid antinociception and tolerance. Rats were microinjected into the vlPAG twice daily for two days with one of the following: saline (0.4 µl), morphine (5µg), fentanyl (3µg,) or morphine (2.5µg)/fentanyl (1.5µg) combination. On Day 3, tolerance was assessed using a cumulative dosing procedure with increasing doses of the morphine/fentanyl combination. Antinociception was measured using the hotplate following each injection. Combined administration of morphine and fentanyl produce a dose dependent antinociception. Rats pretreated with repeated morphine injections showed tolerance when a combination of morphine and fentanyl were injected into the vlPAG on Day 3. In contrast, pretreatment with co-administration of morphine and fentanyl prevented the development of tolerance to the combination of morphine and fentanyl on Day 3. In conclusion, combined morphine and fentanyl administration increased antinociception and decreased the development of tolerance—two changes that could enhance the treatment of pain.

Presentation Number P-93

ABSTRACT:

Abstract Title:	**Nipah Virus Fusion Protein HR3 Region Plays an Important Role in Modulating Membrane Fusion and Viral Entry**		
Presenter:	Cristal Reyna		
Mentor:	Dr. Hector Aguilar-Carreno		**Honors** No
Authors:	Cristal Reyna, Lindsey Robinson, Andrew Vu, Scott B. Biering, Cindy Lin, Benhur Lee, & Hector C. Aguilar		
Presentation Type:	Poster	**College and Major:**	Veterinary Medicine: Microbiology
Category:	Molecular, Cellular, and Chemical Biology		

The Nipah virus (NiV) is a zoonotic, highly pathogenic emerging virus with high bio- and agro-terrorism potential. This project focuses on the novel function of the helical region 3 (HR3) of the Nipah Fusion (NiV-F) protein, which has not been studied in the *Paramyxoviridae* family. The NiV-F protein is involved in the membrane fusion event necessary for viral entry into host cells that contain the mammalian receptor ephrinB2 and for the pathologic induction of cell-cell fusion (Lee *et. al*., 2011). It is known that binding of the viral attachment protein (G) to ephrinB2 triggers NiV-F to carry out viral entry into mammalian cells. However, the mechanism for NiV-F triggering by G is unknown. Our data uncovered a novel role for the HR3 in fusion modulation. Single amino acid mutations in the C-terminus of the NiV-F HR3, where created by alanine scan mutagenesis. Specific mutants in the HR3 displayed hyperfusogenic or hypofusogenic phenotypes, either increasing or decreasing cell-cell fusion and viral entry, respectively. These data strongly suggest that the HR3 plays a critical role in modulating cell-cell fusion and viral entry. This study utilizes new assays to measure the kinetics of the early steps of fusion in order to assess the step(s) of the fusion cascade hyper- and hypo-fusogenic mutants affect. The identification of novel determinants of viral entry in NiV-F offers new potential targets for therapeutic intervention against NiV.

Presentation Number P-94

ABSTRACT:

Abstract Title:	**Stimulus Equivalence in the Domestic Dog: A Test of Inferential Learning Ability**		
Presenter:	Katherine Martucci		
Mentor:	Samantha Swindell		**Honors** No
Authors:	Katherine Martucci		
Presentation Type:	Poster	**College and Major:**	Veterinary Medicine: Neuroscience Arts and Sciences: Psychology
Category:	Social Sciences		

Stimulus equivalence is a complex form of inferential learning in which an organism forms novel relations between stimuli in the absence of direct training and based only on prior knowledge of those stimuli. The criteria for equivalence relations requires that a given set of stimuli be *reflexive* (i.e., a stimulus is equivalent to itself), *symmetrical* (i.e., equivalent stimuli are reversible), and *transitive* (i.e., equivalent stimuli can be related through an intermediate stimulus) (Sidman & Tailby, 1982). These three testable characteristics can be used to experimentally evaluate task comprehension and abstract problem-solving abilities in both human and nonhuman animals. Equivalence testing involves training an organism on a limited number of arbitrary relationships (i.e., conditional discriminations) between multiple sets of stimuli (such as written words, pictures, and symbols), and then subsequently testing the organism's understanding of additional, untaught relations that may have formed between those sets. To date, only studies using verbal humans have produced definitive demonstrations of stimulus equivalence. Studies involving nonhuman animals (e.g., pigeons, parrots, sea lions, chimps), as well as those involving humans with impaired or delayed verbal ability, have produced variable results. This raises questions about species-specific cognitive abilities as well as potential connections between the formation of equivalence relations and language acquisition. The goal of the present study was to test for conditional discrimination capability and stimulus equivalence in the domestic dog. Though the domestic dog is frequently cited in discussions of nonhuman language acquisition, its capabilities have not been tested in the context of equivalence relations nor under well-controlled experimental conditions. The study used an interactive matching task presented to the dogs on a completely automated touch screen training system for testing. The findings of the study contribute to our understanding of species-specific learning capabilities, stimulus equivalence, and the possible relationship between equivalence and language acquisition.

Presentation Number P-95

ABSTRACT:

Abstract Title:	**Mitochondrial DNA divergence in Sockeye Salmon in the Pacific Northwest**			
Presenter:	John Monda			
Mentor:	Gary Thorgaard			**Honors** Yes
Authors:	John Monda			
Presentation Type:	Poster	**College and Major:**	Veterinary Medicine: Biochemistry	
Category:	Organismal, Population, Ecological, and Evolutionary Biology			

This study describes genetic diversity of sockeye salmon (*Oncorhynchus nerka) from populations in Washington, Idaho, British Columbia, and Alaska. Genetic diversity was analyzed among XX individuals from around ten different populations by sequencing a portion of the mitochondrial genome called the D-loop. Considerable diversity was detected among individuals in this maternally-inherited DNA sequence. Identifying single nucleotide polymorphisms that occur in this region and comparing sequence similarity provides a thorough means to analyze population relationships. Similar studies have been done with sockeye but have used parts of the nuclear genome. In this study we test the hypothesis that the D-loop region of the mitochondrial DNA in sockeye reflects a similar pattern of population genetic diversity as regions of the nuclear genome. Information on genetic distinctions among populations is useful for conservation and fishery management programs.*

Presentation Number P-96

ABSTRACT:

Abstract Title:	**Isolation and Characterization of Twenty-Two Novel Mycobacteriophages**		
Presenter:	Sydney Schneider		
Mentor:	Dr. Julie Stanton		**Honors** Yes
Authors:	Nikhil Babu, Christina Beckwith, Kara Beseler, Amanda Brison, Joseph Carone, Tyler Caskin, Molly Diamond, Kenzie Durham, Janey Foxe, Mitchell Go, Bryce Henderson, Isabel Jones, Jessica McGettigan, Matthew Nasrallah, Danny Ortiz, Carly Piller, Sara Privatt, Sydney Schneider, Shaylen Sharp, Tessa Smith, Hannah Ullery, Russell Wilson		
Presentation Type:	Poster	**College and Major:**	Arts and Sciences: Zoology
Category:	Molecular, Cellular, and Chemical Biology		

Bacteriophages are viruses that infect bacteria. They are more abundant on the planet than any other form of life and they live in every environment. They also have many characteristics that make their potential importance to the human race great, such as their ability to change how bacteria affect humans and human antibiotic resistance. Mycobacteriophages are bacteriophages that specifically infect Mycobacteria, a type of bacteria that includes species which cause diseases such as tuberculosis and leprosy. The mycobacteriophages in this study were bred using Mycobacterium smegmatis, which is closely related to the species of bacteria that causes tuberculosis. The objective of this study was to isolate and study mycobacteriophages obtained from the environment and compare them to other previously studied mycobacteriophages in order to categorize them according to their characteristics. Investigating numerous bacteriophages enables us to better understand how they affect bacteria and how that changes the way that bacteria affect their hosts. For each individual bacteriophage, the population was first purified to assure only one type of mycobacteriophage was present. Then, the bacteriophage population was tested to find conditions under which the bacteriophage infected enough bacteria and produced enough particles to extract a high concentration solution of bacteriophage. With this solution, we isolated the DNA of the mycobacteriophages and used restriction enzymes to cut their DNA and obtain restriction digest patterns to see which enzymes cut the DNA and compare the patterns to those of already-categorized mycobacteriophages. Mycobateriophages were also viewed with a transmission electron microscope. The restriction digestion analysis allowed every student to predict what category their mycobacteriophage belonged to. Using transmission electron microscopy led us to conclude that every mycobacteriophage in the study is a Siphoviridae, meaning they have long, contractile tails used to deliver DNA into bacteria. Every student who was able to obtain a solution with a high enough concentration of phage particles presented their bacteriophage as a candidate to have its genome sequenced at Virginia Commonwealth University. The mycobacteriophage ultimately chosen was isolated by Isabel Jones and named Serenity. Currently, we are annotating the Serenity genome.

Presentation Number P-97

ABSTRACT:

Abstract Title:	**Nuclear Excitation by Electronic Transition in U-235**		
Presenter:	Molly Wakeling		
Mentor:	Jason Burke (Lawrence Livermore National Laboratory), Steven Tomsovic (WSU, thesis advisor)		**Honors** Yes
Authors:	Perry Chodash, Jason T. Burke, Molly A. Wakeling		
Presentation Type:	Poster	**College and Major:**	Arts and Sciences: Physics
Category:	Engineering and Physical Sciences		

At an internship this summer at the Lawrence Livermore National Laboratory, I assisted with a Ph.D. project in experimental nuclear physics. The research is for the occurrence of NEET (nuclear excitation by electronic transition) in uranium-235, which can lead to better way of enriching uranium. I also worked on an experiment to measure the half-life of thorium-229m, which can be used to make a much more accurate nuclear clock, among other uses.

Presentation Number P-98

ABSTRACT:

Abstract Title:	**In Vivo Measurements of Rubisco Kinetics in Rice**		
Presenter:	Thomas Sexton		
Mentor:	Asaph Cousins		**Honors** Yes
Authors:	Thomas Sexton, Ryan Boyd, Asaph Cousins		
Presentation Type:	Poster	**College and Major:**	Arts and Sciences: Biology With Botany
Category:	Molecular, Cellular, and Chemical Biology		

Increases in crop productivity are needed to feed the growing world population. Rice is an important source of food around the world and there is a strong research effort to increase its productivity, particularly in response to changing environmental conditions such as temperature and drought. One possibility to increase rice productivity is by enhancing 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 often the rate-limiting step of photosynthesis, which is catalyzed by the enzyme Rubisco. Rubisco is a slow and non-specific enzyme binding both CO_2 and oxygen (O_2). When Rubisco incorporates O_2 the plant undergoes a scavenging process known as photorespiration, resulting in a net loss of CO_2 and energy that could have been used for plant growth. A decrease in photorespiration would mean more efficient uptake of CO_2 and energy usage resulting in increased grain yields. The kinetic properties most relevant to increasing the efficiency of Rubisco are the maximum speed of the enzymatic reaction (V_{cmax}) and the specificity for CO_2 compared to O_2 ($S_{c/o}$). Rubisco kinetics of plant species previously measured suggests a trade off between the speed and specificity of Rubisco. This means a plant's Rubisco ether reacts quickly with little specificity for CO_2, or reacts slowly with high specificity for CO_2. The first step to improving Rubisco for optimizing photosynthesis is to understand the species-specific differences in kinetic parameters. As of now Rubisco kinetics have not been measured in rice, thus limiting our ability to optimize and model rice photosynthesis. My research focuses on measuring Rubisco kinetic parameters for V_{cmax} and $S_{c/o}$ in rice, and modeling photosynthesis under different environmental conditions. This modeling can be used to predict how changes in Rubisco kinetics relate to changes in photosynthesis. Updating current models of photosynthesis that are based on other species with rice-specific kinetic parameters will allow me to identify potential areas for improvement. Furthermore, this research will lead the way for understanding the potential to enhance rice photosynthesis through the optimization of Rubisco kinetics.

Presentation Number P-99

ABSTRACT:

Abstract Title:	**Tri-Cities Governance Study: Phase I**			
Presenter:	Mikko McFeely			
Mentor:	Mike Gaffney			**Honors** Yes
Authors:	Mike Gaffney, Bill Budd, Christina Sanders, Justin Marlowe, Mikko McFeely			
Presentation Type:	Poster	**College and Major:**	Arts and Sciences: Social Sciences / Sustainable Development	
Category:	Social Sciences			

This Ruckelshaus Center study looks at the Tri-Cities Metropolitan Statistical Area (MSA) in an attempt to identify potential opportunities to streamline governance in the Tri-Cities MSA. The study sought to find best practices and case studies from around the United States that would offer some indication of the success of potential public administration strategies being considered by the governments of the Tri-Cities MSA. The area currently relies heavily on multi-government (interlocal) agreements and umbrella organizations but this study evaluates the effectiveness of potential collaboration and consolidation between municipalities and departments. Almost no literature exists on consolidations in areas of Tri-Cities MSA's current and projected sizes but the study focused on the effectiveness of city-city consolidations, annexations, and multi-government agreements. Efficacy of such agreements and agencies are looked at alongside before-after comparisons of government finances in city-city consolidations across the United States. This study indicated that, while consolidation was not a viable option for the Tri-Cities MSA, there were opportunities for different departments and cities to collaborate more closely. Additional study is needed to identify opportunities for expanded cooperation, however. This led directly to the initiation of a second phase that would involve interviewing potential stakeholders to identify the best opportunities and approaches to increased inter-agency cooperation.

Presentation Number P-100

ABSTRACT:

Abstract Title:	**Can Imported Foods Serve as Vehicles for Transporting Antibiotic Resistance Genes?**			
Presenter:	Deven Tokuno			
Mentor:	Dr. Douglas R. Call			**Honors** No
Authors:	Deven Tokuno, Lisa Orfe, Margaret Davis, and Douglas Call			
Presentation Type:	Poster	**College and Major:**	Arts and Sciences: English, rhetoric and professional writing / General Biological Sciences	
Category:	Molecular, Cellular, and Chemical Biology			

Antibiotic use in food animal production is considered a significant factor in the emergence, amplification, and dissemination of antibiotic resistant bacteria. Commensurate public health concerns could lead to policies that significantly curtail antibiotic use in food animal production within the United States. While such policies may be justified, we are concerned that it would not necessarily result in the expected public health benefits. One counter pressure to such policies is the use of antibiotics outside of U.S. borders where regulation and enforcement may be negligible. Importation of food products from these regions could therefore introduce antibiotic resistance elements into the United States. As an initial examination of this idea we chose to determine if antibiotic resistance genes can be readily recovered from farmed and wild-caught shrimp, both imported and domestic.

We hypothesized that recovered antibiotic resistance genes would be present in farmed shrimp imported from developing countries at higher levels as compared to wild-caught shrimp. Uncooked shrimp were purchased from local grocers in Pullman, Washington and Moscow, Idaho representing Indonesia, Thailand (farmed shrimp), Mexico, and the United States (wild-caught shrimp). We readily recovered antibiotic resistance genes from all shrimp samples regardless of presumptive antibiotic inputs. Out of 100 samples tested, 76 conferred resistance to more than three antibiotic drug classes, expressing multi-drug resistance. While our results were not consistent with antibiotic use as a driving factor, we demonstrated that antibiotic resistance traits are easily recoverable from both farmed and wild-caught, uncooked shrimp products.

As a consumer, when shopping for shrimp at the store, farmed versus wild, fresh verses frozen, and imported versus domestic are choices that, according to our findings, have little effect on the resistance present. In fact, wild shrimp from the U.S. Gulf Coast harbored as many recoverable resistance traits as the farmed shrimp from Thailand and Indonesia. This finding suggests that other factors (besides direct farm feeding) may play a role in this challenge, thereby increasing concern for environmentalists and consumers alike. This work will serve to increase awareness of the potential role common grocery store foodstuffs could play in the dissemination of antibiotic resistance traits.

Presentation Number P-101

ABSTRACT:

Abstract Title:	**Women's Integration into the Workforce During World War II: Creating a Hybrid Gender System Lasting from 1941 to 1945**		
Presenter:	Stephanie Meece		
Mentor:	Cherri Wemlinger		**Honors** No
Authors:	Stephanie Meece		
Presentation Type:	Poster	**College and Major:**	Arts and Sciences: History
Category:	Social Sciences		

They would teach you how to walk and how to sit and when you go to someone's home they wanted you to be ladies...to be ladies and play like men, that's what they wanted me to do, so that's what I did!
--Ann Petrovic former All American Professional Girls Baseball League

The attack on Pearl Harbor, December 7th 1941, sparked American men's patriotic duty. The number of men enlisting in armed forces subsequently aided in the growing void in the American labor force. Women were left to fill the economic gap. Out of necessity women adopted traditionally masculine roles in order to meet wartime needs. This trend also impacted the sports world. Baseball, like other industries, struggled with a decreased male population and relied on their only other available labor resource, women. Wartime circumstances provided women the opportunity to participate in the All American Girls Professional Baseball League. The League required it's participants to display a hybridized gender identity emphasizing femininity while expecting masculine athletic participation. This study offers a new perspective on women's integration into the work force during World War II focusing on the flexibility of gender roles based on social needs. Rather than examining gender roles by using a male/female dichotomy this research illustrates hybridized gender expectations of women in the labor force.

Presentation Number P-102

ABSTRACT:

Abstract Title:	**Mutational Study of Histone Arginine Side Chains in Yeast Reveal Vital Contacts with the DNA Minor Groove**			
Presenter:	Linh Tran			
Mentor:	John Wyrick			**Honors** No
Authors:	Linh B Tran, Isaura J Gallegos, John J Wyrick			
Presentation Type:	Poster	**College and Major:**	Veterinary Medicine: Biochemistry / Genetics and Cell Biology	
Category:	Molecular, Cellular, and Chemical Biology			

Eukaryotic DNA is packed into the nucleus by chromatin. Packaging of the DNA can affect processes such as DNA replication, transcription, and gene expression. Changes in chromatin structure can alter these processes and such alterations have been linked to diseases such as cancer. To better understand the effects of chromatin structure, we have performed *in vivo* studies on the basic unit of chromatin: the nucleosome. We have used Saccharomyces cerevisiae (baker's yeast) as our model organism.

Chromatin consists of DNA and the DNA-binding proteins, the histones. The nucleosome is composed of 147 base pairs of DNA wrapped around 8 histones: two each of H2A, H2B, H3, and H4. Previous studies have found that the side chains of arginine residues from the histones interact with the DNA minor groove.

We hypothesize that specific arginine residues of the histones play an important role in regulating DNA repair and chromatin stability. Six of the arginine residues spanning from super helix location (SHL) 1.5 to 6.5 were singly mutated to alanine. Double and triple mutants, where two or three arginine residues were mutated, were also generated. These mutations are designed to eliminate the positively charged arginine side chains, which interact with the DNA, and replace them with the shorter, neutral side chain of alanine. S. cerevisiae with these mutations were treated with known DNA-damaging agents and their viability was assessed.

We concluded that these arginine residues are significant to the DNA damage response. When histone arginine residues were mutated at 3 SHL locations 3.5, 5.5 and 6.5, the resulting yeast cells were more sensitive to DNA damaging agents. Three arginine double mutants displayed a decreased DNA damage response. One double mutant was found to be lethal (H2B arginine 36 and H2A arginine 78). Triple mutants containing this lethal mutant pair were also lethal. We are currently developing an experiment to test the effect of these mutants on the chromatin-mediated repression of a yeast LacZ reporter gene integrated at the HO locus.

Presentation Number P-103

ABSTRACT:

Abstract Title:	**Designer Collaboration Working with the Sciences**			
Presenter:	Brianna Martensen			
Mentor:	Kathleen Ryan, Larry Bruya			**Honors** No
Authors:	Brianna Martensen			
Presentation Type:	Poster	**College and Major:**	Agricultural, Human, and Natural Resource Sciences: Interior Design	
Category:	Arts and Design			

The intent of this project was to understand cross-disciplinary collaboration and engagement through a workshop involving design, geology and environmental sciences students. The workshop addressed the re-design the geology and environmental science exhibit in Webster Hall. The redesign was driven by the lack of user interaction within this informal learning setting. The exhibits have lost the ability to gain the attention from passers-by due to the static quality of the exhibit. This workshop was the catalyst for this research project.

A mixed methods approach was utilized for this research. The design students completed surveys on confidence and engagement before and after the workshop. The surveys included Likert-scale questions on: 1) Interdisciplinary Knowledge and Awareness and 2) Self awareness and Efficacy; and open-ended questions on how the participatory workshop impacted their experience in cross-disciplinary collaboration.

During the participatory workshop, design, geology and environmental sciences students worked together to understand how a 'big idea' story could be told. The workshop atmosphere encouraged all participants to contribute based on their specific discipline.

The comparison between the pre- and post-workshop self-awareness surveys indicated that students improved their ability to communicate with others through the design workshop, were more aware of how their choices affected others, increased their personal connection to the issue of science as well as were more interested in participating in a design workshop as a whole.

The areas where students did not increase in ability were to communicate with others, as well as understanding their personal values in the workshop.

Future work should include determining why students believed their communication skills did not improve. One of the advantages to the workshop format is to improve informal communication between participants. The determination by students of their values should also be addressed. If values are relevant, how should the workshop approach change to encourage improvement in values. The participation workshop is based on interactions between disciplines, and additional information could be collected to determine the exact nature of those interactions. This study has opened doors to the possibility of additional comparisons that could result in a clear understanding of communication and values.

Presentation Number P-104

ABSTRACT:

Abstract Title:	**Immunolocalization of Carbonic Anhydrase**		
Presenter:	Kevin Tran		
Mentor:	Asaph Cousins		**Honors** No
Authors:	Kevin Tran, Jeff Ritter		
Presentation Type:	Poster	**College and Major:**	Agricultural, Human, and Natural Resource Sciences: General Biology
Category:	Molecular, Cellular, and Chemical Biology		

Grasses account for 18%-25% of the global primary productivity (carbon cycle) making them highly important in the plant world. This project concerns localizing an enzyme called carbonic anhydrase (CA) which is responsible for catalyzing the conversion of carbon dioxide (CO2) into bicarbonate (HCO3); an important step in photosynthesis for C4 plants. I aim to locate and study the enzymes in question and find correlations between the CA activity rates and its superstructure, classification of the species', and resolving isotopic work in a researcher's analysis of photosynthetic and also gas exchange rate. To start off the project, grasses are grown in the Abelson greenhouse and are maintained to avoid mixing the different grass species, next will be to take samples of each grass and embed them into resin before sectioning. This is to preserve the tissue to avoid senescence and also keep the cell contents and proteins in a fixed position, followed by immunolocalization where fluorescent antibodies are attached to the enzyme in question, this will allow viewing of enzymes via fluorescent microscope- which is the end goal of the research. In hopes of finding information on the enzyme, I will study the location and concentration of CA in the grass by using an image analyzer program to be able to make conclusions about how well the grasses utilize carbonic anhydrase (makes use of all or just some) as well as looking at the effective path length of water and its likelihood to encounter the enzyme. With this information I expect to calculate the exchange rate of CA and hope to use this and apply it to other grasses and plants.

Presentation Number P-105

ABSTRACT:

Abstract Title:	**Measuring Behavioral Differences Between Hatchery and Wild Rainbow Trout**		
Presenter:	Jonathon Thomson		
Mentor:	Gary Thorgaard		**Honors** No
Authors:	Jonathon Thomson		
Presentation Type:	Poster	**College and Major:**	Arts and Sciences: Zoology
Category:	Organismal, Population, Ecological, and Evolutionary Biology		

The possibility of survival-related behavioral differences between hatchery and wild strains of trout and salmon is a major conservation issue in the Pacific Northwest. We have addressed this issue using two lines of rainbow trout, Whale Rock and Arlee, which descend from vastly different environments. The Whale Rock line was established from wild gametes and the Arlee line was established from fish reared for at least 50 generations in a hatchery environment. The ancestral environments differed in the pressures from predation. In the wild, any behavior that increased a fish's chance of being caught by a predator would likely result in a fitness decrease, but in a hatchery there would not be the same fitness decrease. The discrepancy of predator influenced and non predator ancestries provides a compelling area of research on whether or not hatchery fish respond the same to predators as those obtained from the wild line. Using the program Swistrack, we are able to quantify movement data of the two rainbow trout lines. By observing the fish in similar environments and letting them obtain baseline behaviors, we are able to determine that, after introduction into a novel tank, the wild line tended to utilize a higher water column height and to use the cover less. These unexpected results may indicate that fish with wild ancestries tend to explore new environments more than fish with hatchery ancestries. Exploratory behavior is thought to be important in predatory avoidance.

Presentation Number P-106

ABSTRACT:

Abstract Title:	**Multiple DNA-Independent Interactions between Archaeal RadA Recombinase and Its Paralogs in the Hyperthermophillic Acidophile Sulfolobus solfataricus**		
Presenter:	Antonia Vallejo		
Mentor:	Dr. Cynthia Haseltine		**Honors** No
Authors:	Antonia M Vallejo, Michael L Rolfsmeier, Cynthia A Haseltine		
Presentation Type:	Poster	**College and Major:**	Veterinary Medicine: Biochemistry
Category:	Molecular, Cellular, and Chemical Biology		

Archaea comprise the third domain of life and partially resemble both bacteria and eukaryotes. The similarities between archaeal and eukaryotic DNA metabolism genes have led to the adoption of some archaeal species as model systems for eukaryotic DNA repair. Homologous recombination (HR), a mechanism to repair DNA double-strand breaks, is not yet fully understood. Our model system *Sulfolobus solfataricus* encodes RadA, the archaeal homolog of the eukaryotic Rad51 recombinase integral to HR. *S. solfataricus* also encodes three RadA paralogs: Ral1, Ral2, and Ral3, whose function in HR has not been clearly defined. Since many proteins function in complexes, resolving protein-protein interactions will likely be important in understanding the HR mechanism in this archaeon. To better understand the role of RadA and the RadA paralogs in HR, we have examined the interactions between these proteins. Ni-NTA protein pull-down experiments were performed using 6xHis-tagged Ral2 in combination with untagged Ral1, Ral3, or RadA. We identified a number of specific DNA-independent interactions with our approach, and these results will aid in the further study of these proteins and their role in HR in *S. solfataricus.*

Presentation Number P-107

ABSTRACT:

Abstract Title:	**Empirical Analysis of Space-Filling Curves for Scientific Computing Applications**			
Presenter:	Daryl DeFord			
Mentor:	Anantharaman Kalyanaraman			**Honors** No
Authors:	Daryl DeFord and Anantharaman Kalyanaraman			
Presentation Type:	Poster	**College and Major:**	Engineering and Architecture: Theoretical Mathematics / Arts and Sciences: Mathematics	
Category:	Computer Science, Mathematics, Statistics, and Information Sciences			

Space-Filling Curves are frequently used in parallel processing applications to order and distribute inputs while preserving proximity. Several different metrics have been proposed for analyzing and comparing the efficiency of different curves, particularly in database settings. Here, we introduce a new metric, called Average Communicated Distance (ACD), that models the average pairwise communication cost expected to be incurred by an algorithm that makes use of an arbitrary space-filling curve. For the purposes of empirical evaluation of this metric, we modeled the communication structure of the Fast Multipole Method (FMM) for n-body problems.

Using this method, we empirically address a number of interesting questions pertaining to the effectiveness of space-filling curves in reducing communication, under different combinations of network topology and input distribution settings. We consider these problems from the perspective of ordering the input data, as well as using space-filling curves to assign ranks to the processors. Our results for these varied scenarios point towards a list of recommendations based on specific knowledge about the input data. In addition, we present some new empirical results, relating to proximity preservation under the Average Nearest Neighbor Stretch (ANNS) metric, that are application independent.

Presentation Number P-108

ABSTRACT:

Abstract Title:	**From Earth to Mars: Differentiating Basaltic Eruption Style through X-Ray Diffraction Analysis**		
Presenter:	Kellie Wall		
Mentor:	Michael Rowe		**Honors** No
Authors:	Kellie Wall, Michael Rowe		
Presentation Type:	Poster	**College and Major:**	Arts and Sciences: Geology
Category:	Engineering and Physical Sciences		

On Earth and on Mars, basaltic magmas can reach the surface through a wide variety of eruption styles. In particular, here on Earth, explosive basaltic eruptions can be described in two major styles: “magmatic” and “phreatomagmatic.” Magmatic eruptions occur when high concentrations of gases (such as CO_2 or water) within a magma cause it to erupt explosively, whereas phreatomagmatic eruptions occur when magma interacts with external water that flashes to steam. Prior studies have revealed that the groundmass of basaltic magma may rapidly crystallize after eruption as a function of its cooling rate, with slower cooling leading to more crystalline (vs. glassy) deposits. Therefore, it can be inferred that the slower air-cooling of magmatic eruptions may result in more crystalline groundmass, while the rapid water-quenching of phreatomagmatic eruptions may preserve a more glassy texture. This study aims to quantify this crystallinity difference using powder X-ray diffraction (XRD), a technology available to the current Mars rover. If eruption style can be directly related to crystallinity through efficient, quantitative analysis, this provides a powerful technique for remotely studying magmatic conditions and the presence of surface water or groundwater on Mars.

To conduct this study, sample rock powders of known crystallinity were created and analyzed by XRD to derive a calibration curve. Then, this calibration could be applied to XRD data of basalts from various eruption styles, in order to precisely quantify their crystallinity and observe the relationships to cooling rate. The analyses show promising results: high crystallinity for slow-cooling lavas and ignimbrites, intermediate crystallinity for faster-cooling samples from Strombolian-type eruptions, and most importantly, an approximate 50 percent crystallinity difference between samples of magmatic and phreatomagmatic explosive eruptions. This provides strong evidence that, during current and future Mars missions, researchers could use this XRD technique to extract valuable information about the mechanisms behind explosive volcanism on Mars.

Presentation Number P-109

ABSTRACT:

Abstract Title:	**Dihexa: A Potential Protective Agent Against Neurodegenerative Insults**		
Presenter:	Brandi Ward		
Mentor:	Joseph Harding		**Honors** No
Authors:	Brandi C Ward, Leen H Kawas, Hilary Koenigs, Hamid A Qayoum, Joseph W Harding		
Presentation Type:	Poster	**College and Major:**	Veterinary Medicine: Neuroscience
Category:	Molecular, Cellular, and Chemical Biology		

Alzheimer's disease (AD) is characterized by degeneration of nerve cells (neurons) in the brain. The lack of effective treatments and a growing population of individuals diagnosed with AD necessitates that a new disease-altering treatment be found. Trophic factors, like hepatocyte growth factor (HGF), play an essential role in maintaining the health and well-being, and thus the survival, of neurons. Preliminary work from our lab has shown that Dihexa, an HGF activator, exhibits pro-cognitive effects in rat dementia models and neurorestorative effects in a rat Parkinson's disease model. In expansion of these studies, we are evaluating the capacity of Dihexa to act as a general protectant of neurons against multiple neurodegenerative insults. We induced degeneration in primary hippocampal cell cultures derived from neonatal Sprague Dawley rats by either depriving the cells of required growth factors (starvation) or oxidative stress (hydrogen peroxide treatment). Each experiment included cells treated with Dihexa and controls, which were left untreated. Immunocytochemical methods were engaged to label cells, which were subsequently counted to determine the number of surviving cells for each experimental condition. Studies were carried out in a blinded fashion whereby the experimenter who scored the cultures had no knowledge of the treatment it received. The data showed a significant increase in cell survival in cultures treated with Dihexa compared to those without it. The results indicate that Dihexa can protect against neuronal cell death caused by multiple insults and further suggest that it may possess general protective properties applicable to AD and other neurodegenerative diseases.

Presentation Number P-110

ABSTRACT:

Abstract Title:	**Drug Recognition Experts (DRE): Impaired Driving and The Prescription Drug Abuse Epidemic Challenge**		
Presenter:	Eduardo Mejia		
Mentor:	Dr. Nicholas Lovrich		**Honors** No
Authors:	Eduardo Mejia, Dr. Nicholas Lovrich		
Presentation Type:	Poster	**College and Major:**	Arts and Sciences: Criminal Justice
Category:	Social Sciences		

Since the development of the Drug Recognition Expert program in the 1970s, police officers are trained to recognize impairments, have the expertise to identify these influential drugs other than, or along with alcohol. This research is a part of an ongoing partnership between the Washington State University Division of Governmental Studies and Services and Washington State's DRE program. The goal of the work entails determining whether the current evaluation standards set forth by the Washington State Patrol are sufficiently strict and assessing the accuracy of the DRE officers' assessments of impaired drivers. The analysis will be based on the coding and digitization of all 5000+ DRE assessments done over the period 2006 to 2010 (5 years) and will include the identification of Type I errors (failure to detect) and Type II errors (false attention) as determined by toxicology reports on blood samples. An examination will be made whether the Type I and Type II errors detected are related to driver racial and ethnic background, gender, and age. With this research an understanding of how law enforcement training on "drugged driving" can be improved in Washington State. Through resolving DRE training issues this will ensure that individuals' constitutional rights are full protected while law enforcement safeguards their ability to enforce the states driver safety laws in Washington.

Presentation Number P-111

ABSTRACT:

Abstract Title:	**Solid-State NMR Study of Ethanol Adsorbed on to the Surface of Gamma Alumina**			
Presenter:	Jamie Weaver			
Mentor:	Prof. (Dr.) Karl Mueller			**Honors** No
Authors:	Jamie L. Weaver, Nancy M. Washton, Karl T. Mueller			
Presentation Type:	Poster	**College and Major:**	Arts and Sciences: General Physical Sciences	
Category:	Engineering and Physical Sciences			

Gamma alumina (γ-Al_2O_3) is widely used in industry to catalyze the dehydration of alcohols to produce alkenes. To complete our understanding of the entire catalytic cycle, the sites where alcohols are initially bound to the surfaces of γ-Al_2O_3 must be thoroughly investigated. In this study the adsorption of 1-^{13}C enriched ethanol onto the surface of γ-Al_2O_3 was investigated by ^{1}H-^{13}C and ^{1}H-^{27}Al cross-polarized magic-angle spinning (CPMAS) solid-state nuclear magnetic resonance (NMR), and temperature programmed desorption-inverse gas chromatography (TPD-IGC). The γ-Al_2O_3 samples were pretreated in an evacuated system from 100°C to 500°C in increments of 100°C followed by gas phase dosing with ethanol at 100°C. ^{1}H-^{13}C CPMAS results indicate that the site of ethanol absorption to the surface changes as a function of pretreatment temperature. ^{1}H-^{27}Al CPMAS of the samples showed changes in the surface configurations over the same temperature range, most likely due to dehydroxylation. TPD-IGC data collected for the γ-Al_2O_3 pretreated at 200°C shows ethanol desorbing from the surface at three different temperatures.

Presentation Number P-112

ABSTRACT:

Abstract Title:	**Immediate Effects of a Single Session of Expressive Writing on Negative Affect**		
Presenter:	Rachel Neubauer and Amanda Rukavina		
Mentor:	Dee Posey		**Honors** No
Authors:	Amamda K. Rukavina and Rachel Neubauer		
Presentation Type:	Poster	**College and Major:**	Arts and Sciences: Psychology
Category:	Social Sciences		

The expressive writing paradigm (EWP) developed by Pennebaker has been shown to be effective for a non-clinical population in reducing distress and increasing positive affect and elevating feelings of well-being in most conditions. The expressive writing paradigm typically entails multiple writing sessions, usually 3 to 5, each lasting 15 to 30 minutes in duration. Previous research has shown that writing sessions that are shorter than 15 minutes can be effective in ameliorating negative affect, but each of those studies used multiple writing sessions conducted over varying periods of time. In our study, we wanted to show that a single expressive writing session would help reduce a person's negative mood states enough to be an effective tool to use when dealing with an aversive event or situation. We induced a negative mood state in the participants by having them watch a 15 minute first hand video concerning the events on September 11, 2001 (9/11). After watching the video the participants completed the PANAS-X so we could obtain a baseline negative affect score for each participant. We then instructed them to write specifically about their personal experiences and feelings concerning 9/11 for a single writing session lasting 15 minutes. Immediately after the writing period, the participants completed a second PANAS-X. We found a significant decrease in overall negative affect scores, but strongest and most notably on the measures of "Sad" and "Upset." No significant differences were found between the positive affect scores from pretest to post-test. According to our results a single, short writing session focused on thoughts and feelings on a current negative mood is effective in helping reduce negative feelings immediately. This could be a very inexpensive and imminently accessible treatment skill to teach people who may not be able to afford the time or expense of traditional therapies.

Presentation Number P-113

ABSTRACT:

Abstract Title:	**Student Election Study 2012**			
Presenter:	Russ Walsh			
Mentor:	Dr. Erica Austin			Honors No
Authors:	Russ Walsh			
Presentation Type:	Poster	**College and Major:**	University College:Intended major, Communication	
Category:	Humanities			

With the recent election of 2012 underway, Dr. Erica Austin and Dr. Bruce Pinkleton from the College of Communication led a research team to investigate the factors that influence how young adults view and interpret media, and how their media use affected their vote in the 2012 election. I was invited to join the research team as a freshman investigator and was awarded an Auvil Fellowship to conduct this work. We constructed a comprehensive survey covering topics from student's views on traditional and satirical news broadcasts, their media efficacy skills, and the extent to which humorous programming attracted young people where conventional news organizations did not. It was my responsibility to curate questions directed to people between the ages of 18-24 and to collect a list of unconventional media these young adults are using today. The survey was programmed into third-party survey software known as Qualtrics. I found material to form questions for the survey, brainstormed the path students will take in the question answering process, and did other smaller jobs such as finding a video to use as a control question in the survey. The survey was run during the week prior to the November 2012 election. A total of 721 students from Com 101 responded to the survey. Preliminary analysis of the results has shown several interesting findings already. First, we have found that students are thinking more critically when watching satirical news. Second, students are obtaining news in a diversity of forms including both traditional newsprint and radio but also digital sources such as blogs and user-generated newspages like Reddit. Finally, we also found that family and friends have an influence on what a young person views and how they interpret news. We expect these results to shed light on the importance of non-traditional news media on information that young adults are getting during the election cycle.

Presentation Number P-114

ABSTRACT:

Abstract Title:	**Restoration of Motor Functioning in an Animal Model of Parkinson'S Disease using a Small Molecule Mimetic of Hepatocyte Growth Factor**		
Presenter:	Megan Wilson		
Mentor:	Dr. John Wright		**Honors** Yes
Authors:	Megan Wilson, Daniel Sondheim, Hamid Qayoum, Hank Phillips, Krzysztof Czaja, Leen Kawas, Joseph W. Harding, and John W. Wright		
Presentation Type:	Poster	**College and Major:**	Veterinary Medicine: Neuroscience
Category:	Molecular, Cellular, and Chemical Biology		

Parkinson 's disease (PD) is a motor symptom disease that affects over ten million people worldwide. This disease is characterized by a loss of dopaminergic (DA) neurons located in the substantia nigra (SN) and striatum. Degradation of DA neurons leads to four major symptoms: tremor, rigidity, bradykinesia, and postural instability. These symptoms eventually result in extreme difficulty performing simple everyday tasks including talking, walking, and writing. The most common treatment for PD is oral administration of the drug L-DOPA. This drug is effective at controlling the motor symptoms associated with PD, but over time becomes less efficacious. However, L-DOPA does nothing to address the central cause of PD, i.e. the loss of brain DA neurons. It has been found that facilitating the hepatocyte growth factor (HGF)/c- Met receptor system, a member of the growth factor family, protects against degeneration of DA neurons in animal models. Our laboratory has developed an HGF mimetic, Dihexa, capable of reversing the motor symptoms associated with 6-hydroxydopamine-induced lesions of the SN in rats. Animals treated with Dihexa showed significant motor function improvement as indicated by increased durations on the rope hang and tilt screen tests of motor agility. Rats treated with Dihexa also recovered stride length as evidences by the inked-paw method of gait analysis. Histological analysis revealed that Dihexa encouraged DA neuron recovery in the SN pars compacta. These results indicate that Dihexa is effective in reversing motor dysfunctions in an animal model of PD and offer a possible new approach to the treatment of PD.

Presentation Number P-115

ABSTRACT:

Abstract Title:	**Testing Effects of Body Size, Sugar Resource and Location on Mosquito Survival**			
Presenter:	Kristen Wedam			
Mentor:	Dr. Jeb Owen			**Honors** Yes
Authors:	Kristen Wedam, Amanda Meadows, Jeb Owen			
Presentation Type:	Poster	**College and Major:**	Agricultural, Human, and Natural Resource Sciences: Animal Sciences	
Category:	Organismal, Population, Ecological, and Evolutionary Biology			

The southern house mosquito (SHM), *Culex pipiens quinquefasciatus* is a widespread blood-feeding insect that transmits a diversity of harmful parasites to people and animals. The parasites (and associated diseases) include West Nile Virus (human and equine encephalitis), Haemoproteus (avian malaria), and filarial worms (lymphatic filariasis). Pathogen transmission occurs when female mosquitoes blood-feed on humans and animals to obtain protein required to produce eggs. The probability of pathogen transmission is influenced by a number of physiological, behavioral and ecological factors that shape the interactions between the mosquito, pathogen and vertebrate host. One of these important factors is the survival time of a female mosquito. Theoretically, if a mosquito lives longer, she will have more opportunities to blood feed, lay eggs and spread infectious diseases. Previous studies have shown that mosquito size can affect survival because larger mosquitoes may have more energy reserves and resist desiccation. I conducted an experiment investigating the relationship between size and longevity in a chicken host system to verify these results. Additionally, I investigated if access to sugar resources affected longevity or the potential size effect on mosquito survival. Mosquitoes fed on hosts with no prior mosquito exposure (naïve), and then their offspring were reared to pupation. Pupae were transferred into containers with or without sugar water and allowed to emerge to adulthood. Dead mosquitoes were collected daily and their wing length (proxy for body size) was determined in addition to their gender. The wing length and survival days were compared along with the effect of sugar water availability, gender and location in a controlled vivarium. Results showed no significant correlation between wing length and survival, but sugar water availability, gender and location influenced how long mosquitoes survived. These results suggest that size may not be the main factor in determining the survival time of mosquitoes.

Presentation Number P-116

ABSTRACT:

Abstract Title:	**The Role of the Polymer Host in Reversible Photodegradation**		
Presenter:	David Wyrick		
Mentor:	Mark Kuzyk		**Honors** No
Authors:	David Wyrick, Sheng-Ting Hung, Mark G. Kuzyk		
Presentation Type:	Poster	**College and Major:**	Arts and Sciences: Physics
Category:	Engineering and Physical Sciences		

Organic dyes are widely used in many applications, ranging from organic LEDs, dye lasers, fluorescence microscopy, dye-sensitized solar cells, etc. Photodegradation, the process by which materials change/are damaged irreversibly when exposed to light, limits their usefulness in applications. Dr. Kuzyk discovered that some laser materials (such as PMMA polymer (Poly-methyl-methacrylate) doped with disperse orange 11, DO11 (1-methyl-2-methylanthraquinone)) self heal after photodegradation. The experiments used a Nd:YAG solid state nanosecond laser to pump the material, using its glow (called Amplified Spontaneous Emission (ASE)) to monitor the sample. Using ASE as a probe, it is possible to monitor the decay and recovery process to determine the population of undamaged molecules compared to damaged ones. By observing the ASE signal over a long period of time after the pump laser is turned off, the recovery of the material is readily apparent. Previous research has suggested that the host polymer plays a critical role in the healing of dye molecules after photodegradation. Thus, current research being conducted is trying to determine what mechanisms lead to this phenomenon by varying the host polymer environment from just PMMA to different percentages of MMA and Styrene.

Presentation Number P-117

ABSTRACT:

Abstract Title:	**Determination of Pathogenicity for Bacteria Associated with Diseased Onion Bulbs**			
Presenter:	Jorge Zavala			
Mentor:	Brenda K. Schroeder			**Honors** No
Authors:	Jorge Zavala			
Presentation Type:	Poster	**College and Major:**	Agricultural, Human, and Natural Resource Sciences: Integrated Plant Sciences-Fruit and Vegetable Management	
Category:	Molecular, Cellular, and Chemical Biology			

Members of the *Burkholderia* genus are both onion pathogens and opportunistic human pathogens of those who suffer from Cystic Fibrosis and Chronic Granulomatous Disease. Jacobs et al, 2008 documented that 85% of *B. cepacia*, 90% of *B. cenocepacia*, 76% of *B. ambifaria*, and 15% of *B.pyrrocinia* obtained from the onion rhizosphere and soil were pathogenic in detached onion slice pathogenicity assays. The purpose of this study was to determine what percentage of these microorganisms isolated from onion bulbs exhibiting bulb rot were pathogenic in full bulb pathogenicity assays. In addition, other microorganisms isolated from symptomatic onion bulbs were evaluated for their ability to cause onion bulb rot. Onion bulbs were inoculated with a concentration of 5×10^7 or a 5×10^5 cfu/ml of bacteria using a syringe and then placed at 30°C for 7 days. Bulbs were cut at the point of inoculation and rated for disease as a % of the surface area exhibiting bulb rot. At the higher inoculum concentration, 100% of *B. cepacia*, 100% of *B. cenocepacia*, 100 % of *B. ambifaria*, and 100% of *B. pyrrocinia* caused bulb rot greater than the control (E. coli). At the lower inoculum concentration, 100% of *B. cepacia*, 100% of *B. cenocepacia*, 100 % of *B. ambifaria*, and 33% of *B. pyrrocinia* caused bulb rot greater than the control (*E. coli*).

Presentation Number P-118

ABSTRACT:

Abstract Title:	**Cross Disciplinary Work to Design a Cooperative and Collaborative Playscape**			
Presenter:	Logan Westom			
Mentor:	Kathleen Ryan, Larry Bruya			**Honors** No
Authors:	Logan Westom, Kathleen Ryan			
Presentation Type:	Poster	**College and Major:**	Agricultural, Human, and Natural Resource Sciences: Interior Design	
Category:	Arts and Design			

The goal of the project was to assess how students perceive collaboration on a design project between two separate disciplines; interior design and kinesiology. Through collaboration with different disciplines the solution to a problem is expected to produce a design that accommodates cooperation and collaborative play themes.

The contributions of the kinesiology students was their knowledge about how children play for maximum learning and participation. The interior design students contributions was their ability to design using information provided by the kinesiology students. Through collaboration between separate disciplines, the students would be more successfully create a playscape that accommodated cooperation and collaborative play themes.

Posters developed by students to show their playscape design and potential for different type(s) of play were evaluated using the qualitative method of content analysis. In the first year interior design students were given the task of designing a playscape environment for children. The collaboration between the interior design students resulted in the creation of prototype models of their ideas. In the second year both interior design students and kinesiology students collaborated on a design project. This time both disciplines combined their approach to the task of designing an playscape environment for children.

Comparison of the different type(s) of potential play from year one and year two prototypes and posters showed that an increased number of collaborative and cooperation play themes occurred when kinesiology students were involved in the second year. In year one 0/5 of the posters showed potential for cooperation play or collaborative. In year two 1/11 posters showed potential for collaborative play, 4/11 posters showed potential for cooperative play, and 1/11 posters showed capability for both play themes. Through cross discipline collaboration the play environments were designed to have an increased potential for cooperation and collaborative play.

Based on the results from the second year projects, future projects should have a more focused effort on the collaborative and cooperative playscape. Giving increased effort for interior design and kinesiology students to collaborate on the design of activities involving collaborative and cooperation play will further research in child playscape design.

Presentation Number P-119

ABSTRACT:

Abstract Title:	**Relationship between Science Teaching and Students' Background**			
Presenter:	Yelena Novik and Nemer Tello			
Mentor:	Dr. Andy Cavagnetto			**Honors** No No
Authors:	Yelena Novik and Nemer Tello			
Presentation Type:	Poster	**College and Major:**	Veterinary Medicine: Biochemistry University College: intended major, Neuroscience and Psychology	
Category:	Social Sciences			

This research project focuses on tracking students change in perception throughout a single course. Coming into the course, students come from all sorts of educational backgrounds that varied from no science courses, a lot of science courses, no teaching courses and a lot of teaching courses. This experiment tracks the shift in perception of the whole class as a whole and also focuses on individual students. The research project involves decoding student's ideas and thoughts about videos that deal with science being taught in a classroom setting. In order to decode consistently, a coding sheet has been created, which was the fundamental tool of this project. After this project, this coding sheet will be put to the test by decoding other data sheets.

Presentation Number P-120

ABSTRACT:

Abstract Title:	**Formal Education and its Effects on the Informal Instruction in Santa Rosa de Huacaria, Perú**		
Presenter:	Veronica Puente		
Mentor:	Alex Alvarez		**Honors** No
Authors:	Veronica Puente		
Presentation Type:	Poster	**College and Major:**	Communication: Organizational Communication
Category:	Social Sciences		

Despite the current research on the reform Educación Intercultural Bilingüe [Intercultural Bilingua Education] in Peru, little research has been done on how the lack of or implementation of this reform is affecting indigenous childrens' educational attainment. The aim of this reform is to incorporate childrens' indigenous language and culture in order to improve academic achievement. However, this objective is yet to be met. This study gathers more information in regard to the effects of the formal EIB or non-EIB education on the cultural values informally taught by the parents at the community of Santa Rosa de Huacaria. Through interviews and observation it was exposed that mothers perpetuate the cultural values of thier community, which encourages thier childrens' participation and learning of these values. However, formal education is prioritized over these cultural values leading to more identification with what is taught in the classroom, yet it is not adapted to student's learning needs.

Presentation Number P-121

ABSTRACT:

Abstract Title:	**Designing a Youth Center, Building a Future**			
Presenter:	Beth Ross			
Mentor:	Kathleen Ryan			**Honors** Yes
Authors:	Beth Ross			
Presentation Type:	Poster	**College and Major:**	Agricultural, Human, and Natural Resource Sciences: Interior Design	
Category:	Arts and Design			

As one local Pullman teenager lamented, "[teens] don't do anything during the summer." Pullman needs a central gathering place for teenagers to grow as individuals and feel included in their community. The design of a new youth center in Pullman, Washington addresses how the participatory design process can be utilized with youth. Participatory design engages all the stakeholders in a project to freely discuss their ideas with the designer whose role is to facilitate. A group of Pullman teenagers worked with interior design students in a collaborative charrette or design workshop on the programming and conceptual design of the community youth center in a re-purposed building. The collaborative design charrette helped students be involved in "shaping and managing their environment" while providing qualitative analysis for the researchers. [2] Music, fun, trampoline, study and gym were the most frequently used words by the youth and will be utilized in the design. The youth learn their value in shaping their community and interior design students value the perspective of their "client" through participation. Using the design process, data gathered from the youth has been analyzed and developed into floor plans and perspectives. A conceptual design for the community-supported built environment can be utilized by the stakeholders in future efforts to realize the project. The participatory aspect of the design workshop ensures the development of a sense of ownership in the project by the community youth.

[2] Henry Sanoff, "Multiple Views of Participatory Design," in ArchNet-IJAR: International Journal of Architectural Research, vol. 2, issue 1 (2008), 140

Presentation Number P-122

ABSTRACT:

Abstract Title:	**Resistance to Ectoparasites as a Result of MHC in the Domestic Chicken Infested with NFM**		
Presenter:	Samantha Whiteside		
Mentor:	Jeb Owen		**Honors** No
Authors:	Samantha Whiteside, Jeb Owen		
Presentation Type:	Poster	**College and Major:**	Agricultural, Human, and Natural Resource Sciences: Animal Sciences
Category:	Organismal, Population, Ecological, and Evolutionary Biology		

The major histocompatibility complex (MHC) is a set of vertebrate genes that enables the immune system to distinguish "self" from "non-self" (parasites) through molecule presentation among key immunological cells. This molecular presentation results in targeted production of defensive proteins and proliferation of defensive cells. The domestic chicken is a model for MHC studies because the chicken MHC is smaller and less variable compared to other vertebrates. Chicken MHC genes influence resistance to Marek's virus, which causes paralysis, as well as northern fowl mite (NFM), a blood-feeding ectoparasite that impairs bird egg production. However, it remains unclear if resistances to these diverse parasites are regulated by the same genes. To test if the same region of the MHC regulates virus and ectoparasite resistance, I conducted infestation assays with NFM using two lines of chickens (R2 and R4) that genetically differed at a single locus in the MHC. Previous studies showed the R2 line was more resistant to Marek's virus than the R4 line. In this experiment the two lines (n = 14) were infested with 100 mites per bird. After ~30 days the mite-infested feathers from each bird were clipped-off and mite densities were estimated volumetrically. The R2 line had significantly fewer NFM (average 4481 ±1493) compared to the R4 line (average 23,112 ±16,250), which suggests that the same MHC genes regulate host resistance to intracellular and external parasites. These data may help breeders select for multi-parasite resistance in commercial poultry and provide insight into the evolution of immune function.

Presentation Number P-123

ABSTRACT:

Abstract Title:	**The Surprising Historical Depth of Chinese Currency**		
Presenter:	Larissa Rodriguez		
Mentor:	Lydia Gerber		**Honors** No
Authors:	Larissa Rodriguez		
Presentation Type:	Poster	**College and Major:**	Arts and Sciences: Computer Science
Category:	Social Sciences		

The history of paper currency in China is extensive and rich, yet it finds only occasional mention in historical texts. Dynastic records, however, tracked paper currency almost from its inception nearly 1,000 years ago. They included detailed information on how many notes were circulated, what their purchasing power was, and reasons for over-issuance (such as wars and natural disasters). The study of paper currency not only allows for a fairly accurate and immediate image of each dynasty's economic situation, but the design of the notes themselves and their printed characters reveal much about a period's cultural values and government. Paper notes transcended barriers of status and were handled by nobles and peasants alike, thus representing an artifact familiar to people of many ranks. By studying this often-ignored aspect of China's social structure, this project explores how paper money contributes a fresh and immediate angle to our understanding of Chinese history and culture.

Presentation Number P-124

ABSTRACT:

Abstract Title:	**Latina Mothers' Interaction Quality and Children's Emotional Regulation**		
Presenter:	Yadira Olivera		
Mentor:	Dr. Thomas Power		**Honors** No
Authors:	Yadira Olivera		
Presentation Type:	Poster	**College and Major:**	Agricultural, Human, and Natural Resource Sciences: Human Development
Category:	Social Sciences		

Due to the lack of research available for minority populations in emotional regulation, the present study examines low-income Latina mothers' influences on their preschool aged children's emotional regulation through their interactions during free play. Forty-five Head Start mothers with the mean age of 29.64 years where observed playing with their children in a laboratory setting. Coders rated mothers on five global characteristics that included positive affect, negative affect, sensitivity, intrusiveness, and detached manner. Mothers also completed questionnaires assessing their child's emotional regulation. Of all maternal characteristics, sensitivity was associated with emotional regulation of the child. More sensitive mothers were found to have children with lower levels of anger and who were less negative in their interactions with others.

Presentation Number P-125

ABSTRACT:

Abstract Title:	**Mindfulness, Selves and Spirits in Thailand**			
Presenter:	Justin Van Elsberg			
Mentor:	Julia Cassaniti			**Honors** No
Authors:	Justin Van Elsberg			
Presentation Type:	Poster	**College and Major:**	Arts and Sciences: Anthropology / Psychology	
Category:	Social Sciences			

The Buddhist concepts of *sati* ("mindfulness") and *anatta* ("non-self") are not new, but both have been used loosely in academic literature and popular culture. What is missing from Buddhist studies is contextualization of how people utilize their understanding of these abstractions in their daily lives. Nine semi-structured interviews of novice monks were conducted at Wat Suan Dok temple in Chiang Mai, Thailand and were supplemented with eleven additional surveys of monks and lay students in Chiang Mai University's philosophy department. Both monks and students found metaphors helpful in contextualizing their experiences. Most individuals related their experiences to scholastic study and technologically relevant understandings (such as talking on the phone or driving a car). Additional questions were asked regarding northern Thai conceptions of spirits in relation to mind. Though some individuals believed in spirits, most agreed they had little to do with aspects of mind and more to do with the consequences of attachment on one's rebirth. Such data can be integrated into the study of Buddhism in a way that moves away from objectified, abstractions, into the lives of real people and the real (and diverse) benefits. These benefits may not only have influence in emerging therapeutic fields such as positive psychology, but also may impact the general reception and understanding of what being a Buddhist means, which has both policy implications and implications for those with preconceptions about Buddhism. A final argument is made that such a definition requires a cultural context for meaning to emerge.

Presentation Number P-126

ABSTRACT:

Abstract Title:	**Relationship of Cervical Neck Strength and Head Impacts in Youth Soccer**		
Presenter:	Reed Omdal		
Mentor:	Kasee Hildenbrand		**Honors** Yes
Authors:	Reed Omdal		
Presentation Type:	Poster	**College and Major:**	Education: Athletic Training
Category:	Applied Sciences		

Purpose: Recent research has highlighted alarming rates of concussion incidence among adolescent soccer athletes. Studies have demonstrated neck strength as a possible predisposition to concussive forces, but not in conjunction with quantified impact data and an adolescent population. The purpose of the current study was to investigate a relationship between cervical neck musculature and linear and rotational acceleration values for youth soccer players.

Methods: Isometric cervical neck strength measurements were recorded measuring flexion, extension, and lateral rotation (lbf), with force impact data collected using headbands measuring changes in linear and angular acceleration (rad/s/s). Fifteen male youth soccer players (age = 11.5 ± 0.5 years) were used, comparing their cervical neck strength with impacts recorded during both practices and competitions. Mean values were calculated, with linear and rotational accelerations regressed against the number of impacts recorded for each subject. For analyses, an Alpha level of $P < 0.05$ was used to determine statistical significance.

Results: Increased isometric cervical neck strength was shown to produce higher impact values among youth soccer players. A strong positive correlation existed between flexion strength and both mean linear acceleration ($P = .004$) and mean rotational acceleration values ($P = .001$). Lateral neck strength was also correlated with maximum rotational acceleration measurements ($P = .011$).

Conclusion: Among youth soccer players, cervical neck strength was positively correlated with higher impact values in both mean and maximum rotational acceleration. The findings indicate a potential predisposition to concussive forces among a population with an increasingly prevalent incidence of traumatic brain injury.

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