



Ninth Annual Undergraduate
RESEARCH
Symposium & Celebration
March 25 10:00am - 5:00pm

Acknowledgments



Thank you to the individuals and organizations whose generous donation have supported undergraduate research at Weber State University.

2011-2013

Yaeko K. Bryner in memory of Dale W. Bryner

Stephen & Susan Denkers Family Foundation

Richard F., II & Karen W. Fairbanks

Kem & Carolyn Gardner

Ralph Nye Charitable Foundation

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Schedule

8:00 - 9:00 a.m.
Student & Mentor Breakfast

9:00 a.m. - 3:00 p.m. Registration
Check in and registration for Symposium participants in front of Ballroom C of the Shepherd Union Building

11:00 a.m.
Posters available to view in Atrium

10:45 a.m. -11:00a.m. Performance Session

10:30 a.m. - 12:00 p.m. Oral Session 1

12:00 p.m. - 1:00 p.m. Poster Session 1
In Atrium of the Shepherd Union Building
Light snacks will be served

1:30 p.m. - 3:15 p.m. Oral Session 2

3:00 p.m. - 4:00 p.m. Poster Session 2
In atrium of the Shepherd Union Building.
Light snacks will be served

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Performace Listing

Time	Ballroom A
10:45 a.m.	Weston Larsen - Viola Quartet

Poster Display Listing (Session 1)

- 1: Spencer Arave**
Ebb and Flow of Communication in the Workplace
- 2: ShayLynne Clark**
Group Creativity: Cooperating Across Disciplines
- 3: Amanda Olpin**
The Attitudes and Behaviors of High School Students Towards the School Lunch Program
- 4: Sarah Spedding**
The Effects of Supplementation of Fish Oil on C-Reactive Protein in Obese, Exercising Women
- 5: Anthony Zenger**
Effect of Docosaheaxaenoic Acid (DHA) on Brain-Derived Neurotrophic Factor in Obese Exercising Women
- 6: Amber Acedo**
The Appropriate Stretching for Volleyball and Basketball Athletes
- 7: Shanae Burgin**
Meditation and its Effects on Stress, Anxiety, and Depression

- 8: Allyse Carr**
A Brief Study Looking at the Exercise Habits and Attitudes of College Students on the Campus of Weber State University
- 9: ShayLynne Clark**
Group Performance: Decreasing Stress and Understanding Human Performance Connectivity
- 10: Danielle Dickison**
A Brief Study Looking at the Attitudes and Behaviors Regarding Hypertension in Relation to Stress Among College Students
- 11: Meredith Halls**
A Brief Study of Soda Pop VS Water Intake of Weber State University Students
- 12: Alexis Hurst**
Depression
- 13: Amanda Jones**
Attitudes and Behaviors of College Students in Regard to Their Own Weight Perceptions and Dieting Practices
- 14: Stephanie Keith**
Attitudes and Behaviors of College Students Regarding Music and Moods

- 15: Marie Kemp**
Knowledge of Genetically Modified Food Products
- 16: April Myers**
A Brief Study Looking at the Effects that Positive Affirmations can have on an Adults Quality of Life
- 17: Rebecca Nichols**
Television's Unhealthy Advertising of Food and the Impact on Childhood Obesity
- 18: Alyssa Orr**
Attitudes Towards Complementary Alternative Medicines and its Relation to Health Status Among Weber State College Students
- 19: Brooke Perkins**
A Brief Study Looking at the Behaviors and Knowledge of Pregnant Women
- 20: Holli Rackham**
Attitudes and Behaviors of College Students Regarding Body Size and Perceived Body Image in Relation to Personal Health Practices.
- 21: Cassi Skinner**
Stress Management among Weber State students
- 22: Chandra Tanner**
Knowledge, attitudes, and behaviors of women regarding folic acid supplementation during pregnancy
- 23: Jessica Thorpe**
A Study of the Effects of Music on Stress
- 24: Brogan Van Patten**
Technology: For Better or For Worse?
- 25: Anni Varga**
A Brief Study of the Attitudes and Behaviors of Healthy Adults Regarding the Flu Shot

- 26: Velda Warner**
The Beliefs and Attitude of Weber State University Students Regarding the Effects of Stress on Academic Success
- 27: Logan Allen**
The Nature and Acquisition of Psychological Literacy by Psychology Students
- 28: Emily Brignone**
Stereotyped and Hostile Behaviors in Computer Mediated Communication: A Social Identity Approach
- 29: Matthew Glover**
Nations United: Perspectives on the Fall of the League of Nations and the Rise of the United Nations
- 30: Ariel Hargrave**
The National Alliance on Mental Illness's Peer-to-Peer Class and its Effects on Mental Health Literacy
- 31: Trevor Hicks-Collins**
Understanding the Relationships Between Sleep Cycles and Autistic Symptomology
- 32: Annika Karlsen**
College Tennis Players: Pressure, Abuse, Support, and Involvement from Parents
- 33: Nicholas Smith**
The Effects of Androgen Deprivation Therapy on Brain-Derived Neurotrophic Factor and TrkB Protein Expression

Poster Display Listing (Session 2)

1: Claudia Andrade
Sandbox Kid Excavator

2: Mitch Butler
The effects of stress corrosion cracking on 7075 Aluminum

3: Michael Petersen
A multi-sensor array to study flight dynamics, atmospheric pollution and gas composition in Earth's atmosphere.

4: McKinlei Acord
Adult Client Recall of Oral Health Education Services in an Educational Setting

5: Elizabeth Borg
Pre-Use Validation Study of the Wescor Vapro Vapor Pressure Osmometer

6: Adam Briscoe
Rapid Bacterial Detection in Platelet Units Using Limulus Amebocyte Lysate

7: Danielle Chugg
Microbial Contamination on Photoostimulable Phosphor Plates

8: Mark Harris
Microbial Contamination on Electronic Devices in the Dental Hygiene Environment

9: Marcella Leakehe
An Assessment of Magnification Loupes in Weber State University's Dental Hygiene Program

10: April Lewis
Paramount Importance of Pediatric Oral Health

11: Jacque Rivas
Sealant Longevity: An Evaluation of Weber State University Dental Hygiene Sealant Clinics

12: Ashlee Shemenski
Oral Piercings: What do Patients Know and what do Body Modification Studios Tell Them?

13: Jenna Stuart
Are Womens Eating Habits Affected by Stress?

14: Misty Toupin
Methamphetamine: What Do Dental Hygienists Know?

15: Jennifer Ulrich
Dental Hygienists' Knowledge and Teaching Practices Regarding Diabetes and Periodontal Disease

16: Mary White
Attitudes and Behaviors of Expecting Mothers Regarding Fluoride in Drinking Water

17: Alena Yarema
Cholesterol and Triglycerides Assay Validation

18: Rosana Baldraco
In Situ Measurement of Stratospheric Ozone Above Utah's Uintah Basin

19: Jason Bass
Determination of Microbial Populations in a Synthetic Turf System

20: Tabitha Berghout
Using GIS to Document sand dune movement and change in the San Rafael Desert, Southern Utah

21: Haylie Cox
Comparative molecular genetics of the unusual chromosome telomeres of *Drosophila*

22: Jessica deJong
Effect of Glyphosate and Roundup on the Brineshrimp *Artemia* Survival and Physiological Responses

23: Amanda Gentry
Patterns of Synorogenic Sedimentation and Unroofing History of the Willard-Paris-Meade Thrust Sheet, Sevier Fold-Thrust Belt

24: Stephanie Hansen
A Complex Protein Diet can Improve Rehabilitation Following Intestinal Atrophy

25: Katy Heitkamp
Costs Associated with Colonial Nesting in American Avocets (*Recurvirostra Americana*)

26: Julia Hull
Fungal Endopyte Frequency of *Populus Fremontii*

27: Sean Hunt
Characterization of Salt Tolerance of Halophilic Bacteria isolated from the Great Salt Lake

28: Lauren Johnson
Isolation and Characterization of Novel Bacteriophage from the Great Salt Lake that Infect *Halomonas*

29: Julianne Lemmon
The Sedimentology and Petrology of the Moroni Formation; Indianola, Utah

30: Byron Millet
Calibration and Modification of Off-The-Shelf Gas Sensors for Monitoring Earth's Atmospheric Chemistry

31: Scott Nagao
Novel Survey of Normal Skin Biota its Interaction with Chytrid Fungus in Frogs and Toads

32: Justin Nybo
Gas Chromatography Analysis of Fatty Acid Methyl Esters from *Chlorella vulgaris* Algae

33: Seth Peterson
Vibrio metschnikovii Associated with Brine Shrimp Eggs Isolated from the Great Salt Lake in Utah

34: M. Clay Rumsey
Engineering, Design and Construction of a High-Vacuum Research Facility

35: Kristi Russell
Internalization and Survival of *Salmonella* in Tomatoes

36: Alisha Ryan
Plant Secondary Metabolites as Inhibitors of Drug Resistant Bacteria Causing Wound Infections in U.S. Military Personnel

37: Dexter Snyder
Isolation of Enteric Bacteria from Fresh Water Aquariums

38: Ronnamay Walker
Native Ground Covers To Manage Invasive Weed Growth During River Restorations

39: Sara Yearsley
Facies and Provenance Changes in the Cap-Carbonate Interval (CA. 685-<665 MA) of the Neoproterozoic Pocatello Formation, Scout Mountain Area, Southeast Idaho

40: Shane York
Flow Rate and Filter Efficacy Analysis for measurement and Collection of Stratospheric Aerosols.

Oral Presentation Schedule (Session 1)

Time	312	316
10:30 a.m.	Taylor Nelson Survey for Helenalin Among Utah Asteraceae Species	Anja Greenhalgh Comparison of Tooth Soap and Colgate on General Oral Health
10:45 a.m.	Jackie Parker Maternal selection vs. paternal competition: embryo development in <i>Sophora japonica</i>	Daniel Feller The Effects of Cortisol on Auditory Processing and Perception
11:00 a.m.	Ashley Badley Antibiotic Resistance of Enterococci Isolated from the Great Salt Lake and Fresh Water Sources	Jennifer Bench Auditory Processing and the Stress Response: How the Startle Response and Habituation May Be PTSD
11:15 a.m.	Michelle Kimball Prevalence of <i>Escherichia coli</i> O157:H7 in Grain fed Cattle and the Implications to Public Health	Hanna Baskerville Assessing the Risk of Unionization
11:30 a.m.	Sherry Sorenson Antimicrobial Properties of Essential Oils for Surface Disinfecting	Richard Bell Aeolian Sedimentation and Climatic implications of the Bruneau Dunes, Idaho
11:45 a.m.	Ryan Wilcox Synergistic Effects of Essential Oils and Antimicrobials against Drug Resistant Bacterial Pathogens	Paul Greenhalgh Creating a Sense of Home: Examining the Personal Belonging of World War II Servicemen
12:00 p.m. - 1:00 p.m. Poster Session 1 with Light Snacks		

Oral Presentation Schedule (Session 2)

Time	312	316
1:30 p.m.	Karlee Emal Effects of glucose on swarming motility of <i>P. mirabilis</i>	Michelle Washburn The Effects of Employment on College Students' Academic Performance
1:45 p.m.	Jason Davis Elevated alanine aminotransferase (ALT) in the deceased donor: Impact on early post transplant liver allograft function	Amy Fiscus Motivational Factors in Students Joining PRSSA
2:00 p.m.	Britton Odle Glucose Metabolism in Group O and Non-O Blood Types	Kiersten Voorhees 14 Days of Summer Fun
2:15 p.m.	Richard John Alpha-1 Antitrypsin And The Diagnosis Of Exercise-Induced Bronchoconstriction	Hannah Rice Sustainable Transportation: An Analysis of Bicycle Infrastructure surrounding Weber State University
2:30 p.m.	Rachel Augsburger The Importance of DNA Evidence Packaging	Shauna Wolfgram The Role of Historic 25th Street Farmers? Market in Ogden Food Desert Areas
2:45 p.m.	TJ McIntosh Using epMotion to Reduce Cross-Contamination During Viral RNA Extraction in Real Time PCR	Todd Spencer A Comparative Study of Youth and Parent/Guardian Perceptions of Risk Factors that Lead to Adolescent Delinquency
3:00 p.m.	Eric McKinney Isomorphic tests using invariants and adjacency matrix reordering.	Travis Padilla The Secret Informant Deep Throat in American Popular Culture.
3:00 p.m. - 4:00 p.m. Poster Session 2 and Light Snacks		

College of Applied Science and Technology

Sandbox Kid Excavator

Abstract Authors: Claudia Andrade,
Aaron Allred, James DeVall, Jason Hunt,
Byron Little & Trent Sine
Abstract Mentor: Megumi Leatherbury

Poster Display 1 (Session 2)
Engineering Technology

During the academic school year of 2010-2011 a senior project group had the task of designing a Kid Excavator. They researched what design was best suited for children ranking 3-5 years of age. The group planned on donating the finished product to Weber State University's Elementary School program for their outdoor playground area. They considered different concepts and build the one chosen by the school faculty. The force required to operate the excavator exceeded the children's strength capacity. Our task was to minimize the pulling force. We plan to make the body out of structural steel pipe and the bucket out of a thinner gauge steel plate to maintain rigidity while reducing weight. Redesigning the device was easier than trying to correct previous errors since their previous designs were discharged. Our design will make the excavator easier for children to use. It will not include a seat, so it will be more ADA accessible, which will improve the School's playground in terms of being more ADA compliant.

The Effects of Stress Corrosion Cracking on 7075 Aluminum

Abstract Author: Mitch Butler
Abstract Mentor: Daniel Magda

Poster Display 2 (Session 2)
Mechanical Engineering Technology
Denkers Undergraduate Research Scholarship

The research involves material testing for the time dependent failure mode of stress corrosion cracking (SCC) of high strength 7075-T651 aluminum. Basically we are fabricating C-ring test specimens and conducting SCC test with the following criteria: 1) three different corrosive environments, 2) two different material orientations, 3) anodized surface treatment. The characterization will be a pass/fail to SCC and the amount of time recorded for failure for the above environments and grain orientation conditions.

Undergraduate Research

A Multi-sensor Array to Study Flight Dynamics, Atmospheric Pollution and Gas Composition in Earth's Atmosphere.

Abstract Author: Michael Petersen

Abstract Mentor: Fon Brown

Poster Display 3 (Session 2)
Electrical Engineering

High altitude weather balloons are a valuable tool in understanding Earth's climate and weather systems. However, a shortage of data exists for gas compositions and particulate levels at altitudes attainable by weather balloons; most aircraft fly far below them and spacecraft orbit high above them. Weight and price are two major constraints when selecting scientific instruments to fly onboard weather balloons. Until recently, these factors have limited the quantity and variety of science achievable with weather balloon systems. Advances in technology are making it possible to fly circuitry capable of filling the gap in atmospheric data. Our team has surveyed the market for sophisticated, affordable, and lightweight electronic devices needed to build the next generation of scientific instruments for gathering data at the edge-of-space and from the polluted atmospheric inversion zones common in urbanized mountain basins. We are creating a new Multi-Sensor Array (MSA) which consists of accelerometers, magnetometers, temperature sensors, and pressure sensors. The new system will support an expandable array of particulate and gas sensors; with added radio telemetry capabilities and a simpler user interface. This system will fly to the mid-stratosphere (30-34km) on the WSU HARBOR (High Altitude Reconnaissance Balloon for Outreach and Research) missions.

College of Arts and Humanities

Ebb and Flow of Communication in the Workplace

Abstract Author: Spencer Arave
Abstract Mentor: Susan Hafen

Poster Display 1 (Session 1) Communications

Communication is vital to every organization. The success of a business, group, or relationship is dependent on the individuals' ability to communicate a message. This project involves discovering how the communication flows within an anonymous corporation. I used the medium of an ECCO analysis and interviews to determine the best way for communication to flow in this organization. Expressing [communication] in a professional way is crucial to maintaining a business like atmosphere. (Miller, 205)

I list several ways, through the Human relations lens, that will help this organization become more productive. The results of these findings have led me to use the Human Relations approach to helping this organization become more attuned to the need of a better communication flow, and treating each other as they would want to be treated. The processes of Socialization, Conflict, and Emotion are best dealt with this approach.

I propose giving a training which covers these three issues of: Socialization, Conflict and Emotion. I cover the basics discussed in this paper and the need for improvement. I recommend giving the training to the Senior Management and other invited employees.

Assessing the Risk of Unionization

Abstract Author: Hanna Baskerville
Abstract Mentor: Susan Hafen

Oral Presentation (Session 1) Communications

Although they may seem like a thing of the past, labor unions are winning more elections than ever due to their careful campaign selection processes. Although the total number of elections have decreased, the National Labor Relations Board (NLRB) announced that Unions are winning approximately 70 percent of their strategically selected representation elections (NLRB 2012) and that membership rates rose in 14 states during 2012 (BLS 2012). Research shows that the organizational discontent driving unionization is caused by management practices and overall organizational communication (SHRM 2012).

Ebay, Inc's Human Resources conducts a yearly employee engagement survey at each of its North American worksites to better understand overall employee job satisfaction and engagement. At two recently acquired Ebay, Inc. worksites, employees reported high levels of dissatisfaction in respect to management, pay, communication, working conditions and treatment. Based on that survey, this study analyzes the correlation between managerialism and Ebay, Inc's potential vulnerability to unionization. The results gathered from this analysis were then used to design a risk assessment that can be used throughout the organization to assess each location's vulnerability to union organizing. The study also makes recommendations for specific organizational cultural changes to remain union free.

Group Creativity: Cooperating Across Disciplines

Abstract Author: ShayLynne Clark
Abstract Mentor: Mark Henderson

Poster Display 2 (Session 1)

Music

Nye Undergraduate Research Scholarship

Group creativity is multi-faceted; beginning with individual contributions combining to form a medium that is greater than the sum of its parts. According to the sociocognitive model of creativity, the potential for creativity depends on how group processes take place; whether it be through discussion and voting, or improvisation. The composition of the groups as well as the organizational context is key to creating a cohesive and replicatable outcome, but it is mediated through the number of individual innovations as well as the quality of those innovations. This experiment is a qualitative and quantitative journey to understand the unique interaction between performing groups, with an in-depth case-study example investigation into Weber State University's Moving Company and Chamber Choral Ensemble and how they came together to create the "Coil" performance. Participants will be administered a survey at the end of the performance run, and the responses will then be statistically analyzed with psychometrics as well as a multiple regression. Researchers will also be observing the group interaction, looking for patterns and attitudes that were both beneficial and detrimental to the creative process. These items will be coded and discussed in-depth. Participants will also take part in an improvisational performance exercise in a double blind quantitative experiment. Understanding how groups of individuals create together will give society and the arts a unique insight into the creative process and its innovation.

Motivational Factors in Students Joining PRSSA

Abstract Author: Amy Fiscus
Abstract Mentor: Yeonsoo Kim

Oral Presentation (Session 2)

Communications

In trying to figure out what benefits most motivate students to join undergraduate co-curricular programs, such as the Public Relations Student Society of America (PRSSA), this study examined motivational factors that would influence students to join the organization. This study employed a survey of communication students that would potentially join the organization. The study found that student awareness of PRSSA was low, with only 31.3 percent of survey respondents being aware of a PRSSA chapter at Weber State University. The top causes of students not joining PRSSA were the perceived time commitment it would take, followed by students being unsure that the experience was worth the effort and concerns about the membership fee. Tuition waivers and scholarships (measured separately) were equally the most motivating factors influencing students to join PRSSA, followed by professional experience, networking opportunities, and several other factors. The study also found that higher ranking of individual PRSSA membership benefits, such as tuition waivers, as being a motivational factor increased student intent to join PRSSA.

Viola Quartet

Abstract Author: Weston Larsen
Abstract Mentor: Michael Palumbo

Performance

Performing Arts

I have written (composed) a quartet for four violas and my teacher and I think it would be a good opportunity to get it performed publicly. My fellow violists will be performing the parts while I observe and make changes to make sure the parts work, individually and collectively.

14 Days of Summer Fun

Abstract Author: Kiersten Voorhees
Abstract Mentor: AnDrew Tyler

Oral Presentation (Session 2)

Communications

I will be showing a presentation video of work that I and two other WSU students worked on in the Summer of 2012. I will share our findings and what improvement was made in our department.

Bachelor of Integrated Studies

Group Performance: Decreasing Stress and Understanding Human Performance Connectivity

Abstract Author: ShayLynne Clark
Abstract Mentor: Heather Chapman

Poster Display 3 (Session 1)
Psychology
Nye Undergraduate Research Scholarship

Vocal musicians are faced with physiological stress when they perform. Ryan & Andrews (2009) found that performance stress is a common experience for choral singers. Kenny, Davis, & Oates (2004) found that choristers had three times the amount of trait anxiety than the normative sample in their study and that trait anxiety was highly correlated to music performance anxiety. Performance stress has been correlated to the anticipation of a performance (Lee, 2002), as well as to many other aspects of performing (i.e. audience, technical difficulty of music, pressure from conductor, etc.) which can manifest with symptoms such as an increased heart rate, sweating, dry mouth and increased salivary cortisol levels (Goode, 2004). Cortisol is a hormone important to normal physiological functioning, and it can be used as an indicator of stress and arousal. It is a glucocorticoid which is derived from cholesterol (Meyer & Quenzer, 2005). Cortisol is sometimes known as the “æstress hormone” because levels tend to increase in stressful events to help the person cope with the stressor (Lai et al, 2005). This study examined if and why small choral performing groups seem to experience a de-stressing effect after participation. A sample of 31 undergraduate music students ($M = 23$) participated in this study. All 31 participants were student members of a small chamber choir at Weber State University, a large Western university. A combination survey of the Singer’s Emotional Experience Survey (Ryan & Andrews, 2009), the Choral Experience Questionnaire (Kokotsaki & Davidson, 2003; Sarason, 1986), and the State Trait Anxiety Inventory (STAI) (Bieling, Antony & Swinson, 1998) were used to gather

the performance history as well as stress ratings and symptoms from the choral singers. A combination of these particular surveys was created to allow for more in-depth data collection relating specifically to the choral experience. Furthermore, to understand the mechanism of decreased stress experienced when a performer is in a group, the cortisol levels of each performer were tested once outside of choir rehearsal to find a baseline, then the three times pre and post group rehearsals, and twice pre and post performances. The preliminary results of this study show that choir participation significantly decreased salivary cortisol concentration for all participants during both rehearsal and performance conditions. Currently, statistical analyses are being performed to elucidate this interaction. A full report will be available January 2013.

The Attitudes and Behaviors of High School Students Towards the School Lunch Program

Abstract Author: Amanda Olpin
Abstract Mentor: Susan Hafen

Poster Display 4 (Session 1)
Bachelor of Integrated Studies

School lunch has been a part of adolescence for many years. There are policies that regulate the quantity, selection, and quality of what teenagers alike will consume during that proverbial hour. It is the intention of this study to learn how this regulated time period is used by the students and whether the policies have taken their intended effect. In this study, surveys were conducted throughout different High Schools in the Ogden, Utah area. The subjects were asked questions regarding what kinds of beverages they are drinking on a daily basis, where they eat during the lunch hour, and their behaviors and attitudes of the school lunch provided. They were also asked to report their age, height and weight in order to calculate the average Body Mass Index (BMI) from each school. It is predicted that more high school students obtain lunch from places other than the school cafeteria. It is also predicted that those students who participate in the school lunch program are more likely to eat healthier foods and therefore have a lower BMI.

Effects of Supplementation of Fish Oil on C-Reactive Protein in Obese, Exercising Women

Abstract Author: Sarah Spedding
Abstract Mentor: Rodney Hansen

Poster Display 5 (Session 1)
Bachelor of Integrated Studies
Gardner Undergraduate Research Scholarship

Rationale: C-Reactive Protein (CRP) is fast becoming the standard in detecting inflammation and therefore disease. It is known that obese individuals experience chronic inflammation. It is also known that factors such as fish oil ingestion and exercise can beneficially influence inflammation levels. The aim of this pilot study was to investigate the effect of fish oil supplementation on obese women initiating in an exercise program by measuring their CRP levels over a five month period. In a double-blind randomized placebo-control group study, twelve subjects with a BMI of over 30 received either fish oil (FO) (2g/d EPA &DHA), or 2 g/d corn oil for twenty weeks. Blood samples were taken prior to treatment and then every two weeks for total plasma DHA (via GC chromatography) and CRP (via ELIZA sandwich). Results: The study showed that although DHA levels were significantly elevated in the FO group, the CRP levels in the FO group were not significantly decreased over time. Conclusion: This pilot study showed an increase in serum DHA. While some of the subjects CRP levels improved with DHA, it was not consistent. Further investigation is warranted with larger sample sizes in order to make any definitive recommendations.

Effect of Docosaheaxaenoic Acid (DHA) on Brain-Derived Neurotrophic Factor in Obese Exercising Women

Abstract Author: Anthony Zenger
Abstract Mentor: Rodney Hansen

Poster Display 6 (Session 1)
Nutrition Education
Gardner Undergraduate Research Scholarship

Brain-derived neurotrophic factor (BDNF) is a protein that is encoded for by a nerve growth factor gene. It is expressed in many regions of the central nervous system, and plays a vital role in cell differentiation, survival, and synaptic plasticity. In several studies brain and serum levels of BDNF were found to be significantly lower in beginning Alzheimer's disease as compared to normal controls, alluding to BDNF's role in preventing progressive neuro-degeneration.

Several studies have shown a link between the levels of DHA and BDNF in rodents, but to our knowledge no studies have been performed to evaluate DHA and BDNF relationships in humans. For this study a group twelve student volunteers from the exercise group, Weber in Motion (WIM), were recruited to participate. Of the twelve participants six were given three grams of DHA supplements each day while the other six were given a placebo supplement. Initial results have shown a direct link between DHA and BDNF levels in obese exercising women.

Jerry and Vickie Moyes College of Education

Meditation and its Effects on Stress, Anxiety, and Depression

Abstract Author: Shanae Burgin
Abstract Mentor: Michael Olpin

Poster Display 7 (Session 1)
Health Promotion and Human Performance

Meditation is a practice used to reduce the stress that an individual is feeling, yet it is not something used among a large population. A voluntary survey was submitted to 115 adults between the ages of 20 and 60 years of age that were either stay at home mothers, had full time jobs, or were college students also working full or part time jobs. This survey simply questioned about the participant's daily stress levels and their knowledge and interest levels associated with meditation. The results of the survey indicated that the participants on average dealt with moderate to high stress levels and knew about meditation and the benefits it provided, however they did not practice it regularly for various reasons such as lack of time, disinterest, not knowing how or not caring to learn. The majority of the participants (92%) believed that meditation could provide benefits, and yet 57% of the total responders had never practiced meditation. . Of the total participants, 47% said that they were somewhat interested in learning how to meditate and 25% said that they were very interested in learning how to meditate.

The Appropriate Stretching for Volleyball and Basketball Athletes

Abstract Author: Amber Acedo
Abstract Mentor: Michael Olpin

Poster Display 8 (Session 1)
Health Promotion and Human Performance

Throughout sports history, stretching was known to be an important aspect to prevent injuries. A voluntary survey was administered to 100 college athletes ages 18-35 throughout colleges in Utah. This survey was intended to ascertain the knowledge, attitudes, and behaviors of specific athletes. The majority of the participants surveyed knew what static and dynamic stretching is, knew that dynamic stretching increases performance and decreases muscle injury, and engaged in dynamic stretching at practice and games. Sixty-five percent felt that static stretching combined with dynamic stretching helped their performance and decreased muscle injury rather than just static or dynamic stretching.

The results indicate that most of the participants felt that dynamic stretching affects performance and muscle injury in a positive way and engage in dynamic stretching. However, two percent of the student-athletes felt that no stretching helps their performance or decreases muscle injury although they agreed that dynamic stretching does in fact increase performance and decrease muscle injury. This may indicate that they believe the facts are true, but feel that they are the exception. The results also indicate that the athletes do not only engage in dynamic or static stretching, but a variety of stretches at practice and games.

A Brief Study Looking at the Exercise Habits and Attitudes of College Students on the Campus of Weber State University

Abstract Author: Allyse Carr
Abstract Mentor: Michael Olpin

Poster Display 9 (Session 1)
Health Promotion and Human Performance

Exercise habits and attitudes vary among college students. Often exercise time is lost due to the many demands on a student's time: schoolwork, homework, job, family, etc. A voluntary survey was administered to 100 Weber State University students on the main Weber State campus. The purpose of the survey was to determine the exercise habits of Weber State students as well as their attitudes toward exercise. The majority of students surveyed do seem to lead an active lifestyle with at least four or more days a week containing either a weight training exercise or an aerobic exercise. Most students were able to identify various types of aerobic activities that exist both inside traditional gym facilities and outside. The majority indicated that they would participate in gym activities if they had a membership and knew the activities were enjoyable. Almost all participants surveyed were aware that Weber State University offers free gym facilities for enrolled students. However, Weber State University students still have many demands on their time. In this survey, the top three recorded reasons for missing a workout were that students do not have enough time, they have too much homework, or they are too busy.

A Brief Study Looking at the Attitudes and Behaviors Regarding Hypertension in Relation to Stress Among College Students

Abstract Author: Danielle Dickison
Abstract Mentor: Michael Olpin

Poster Display 10 (Session 1)
Health Promotion and Human Performance

With a fast paced society, it has become more prevalent that stress affects everyone. College students are among the top percent of the population that report being stressed for extended periods of time. With this incline of chronic stress it is expected to ask what the health affects may be to the college student population. Among many studies researched, along with genetic disposition, there is an apparent correlation between hypertensive symptoms and the stress levels of college students. In this study, college students were surveyed to analyze where what their attitudes and behaviors may be in relation to the correlation of stress and hypertension. In the results of this study, it is found that many college students are unaware of how strong the link may be for hypertension and stress. Along with that, students also seem to be uninformed of the necessary steps to monitor their blood pressure. Students at risk, specifically with the fore mentioned genetic disposition, must take action in becoming aware of their stress levels and the lethal affect they place on their health in regards to hypertension.

A Brief Study of Soda Pop VS Water Intake of Weber State University Students

Abstract Author: Meredith Halls
Abstract Mentor: Michael Olpin

Poster Display 11 (Session 1)
Health Promotion and Human Performance

A major health concern is that there seems to be a trend in the American population of drinking more sugary drinks such as soda pop and juice more often than water. This leads to many health concerns such as type 2 diabetes and higher calorie intake than calorie outtake resulting in unhealthy weight gain. A study was done among Weber State University students to assess how much soda pop or other caloric drinks they were consuming compared with their water intake. There were 100 students who took the survey ranging from ages 19 to 31 and up. Those surveyed 65% answered zero on how many soda pop drinks they had a day while 29% answered 1-2 soda pop drinks a day. While 83% drank water throughout the day excluding meals and 66.7% drank water during their meals. Of these students, if and when they work out, 70% drink only water after their workout.

Depression

Abstract Author: Alexis Hurst
Abstract Mentor: Michael Olpin

Poster Display 12 (Session 1)
Health Promotion and Human Performance

Depression is a seriousness sickness which affects people young and old throughout the world. This survey was intended to ascertain how many people are diagnosed with depression and if they are getting any kind of help. The majority of participants surveyed do not suffer from depression but know someone who does suffer from this sickness. Based on the results, nine percent suffer from depression, sixty-four percent do not suffer from depression, and twenty-seven percent sometimes suffer from depression. It is interesting to note that seventy-nine percent of those who responded to this question do know someone who suffers from depression and twenty-one percent said they do not.

Based on the results, the five most common responses for what someone does to feel better when depressed are exercising, eating, talking with friends and family, thinking positive thoughts, and sleeping. The five most common answers for what they do to help the person they know feel better is be a listener, take them out, listen to music, see a doctor, and give him or her treats. These results leave one to wonder if what they are doing to help themselves and others feel better when feeling depressed actually works.

Attitudes and Behaviors of College Students in Regard to Their Own Weight Perceptions and Dieting Practices

Abstract Author: Amanda Jones
Abstract Mentor: Michael Olpin

Poster Display 13 (Session 1)
Health Promotion and Human Performance

Body Images image is an important part of who each one of us is. In my research many studies showed that families and peers had the most influence on body image in children and young adults. In this research study it was decided to look into how Weber State University students perceived their weight and body and their dieting behaviors. For this study 100 Weber State University students were surveyed, of these 100 students 73 percent viewed themselves as a healthy average weight and on a scale from 1 to 10 the average level of body satisfaction was a about 7. When asked what age that they were most satisfied with their weight 30 percent said they were happiest at ages 19-20. Whereas when they were asked when they were unhappiest with their weight 27 percent chose 21-23. When asked which area of the body they would change given the choice 65 percent said they would change their stomach. Of the 100 participants 62 percent had attempted to diet one or more time in the last two years, of those 62 about half were satisfied and half. Also 14 percent had at some point tried unhealthy diets to lose weight.

Attitudes and Behaviors of College Students Regarding Music and Moods

Abstract Author: Stephanie Keith
Abstract Mentor: Michael Olpin

Poster Display 14 (Session 1)
Health Promotion and Human Performance

This study focused on music and how it affects mood regulation with college students. A survey was conducted, one-hundred students (65% female, 35% male) answered questions about if music was perceived as a useful tool in mood and emotion regulation in both general and personal terms; if music was influential subconsciously by the tempo and mode; the duration music was listened to, the preferred genres; and different ways music was used to personally regulate moods.

Based on the results of this study, every student viewed music as a useful method to regulate moods and the tempo and mode makes a subconscious impact on an individual. Forty percent of students listened to music three to four hours each day, which had the highest percentage. The most popular genres were Pop (75%), Rock (67%), and Alternative (66%). The top two ways that music was used was to provide a way to relax and recharge (62%) and to energize and uplift a current mood (36%). This study concludes that college students view music as effective in influencing mood and that students use music to help themselves in various ways to regulate their own mood.

Knowledge of Genetically Modified Food Products

Abstract Author: Marie Kemp
Abstract Mentor: Michael Olpin

Poster Display 15 (Session 1)
Health Promotion and Human Performance

Genetically modified foods, or GM foods, have been a subject of much controversy in California this past election of 2012. Proposition 37 would require food producers to label whether their food products contain GM foods or not. Studies that have previously been done indicate U.S. Consumers have not been knowledgeable about GM foods and their prevalence in our food products as well as the more current research showing the possible health concerns involved with their use. This research study asked 100 consumers located throughout the Ogden, Utah area about their knowledge of GM foods and if they feel food producers should be required to label their food products. They also were asked if they are the primary food purchaser for the foods they eat to indicate their experience with purchasing food for themselves.

This study indicates that this knowledge has increase somewhat and shows that the majority of respondents (81%) indicated that they feel food producers should be required to label whether their food products contain GM foods or not. One percent disagreed, four percent strongly disagreed with this decision and fourteen percent were neutral in their opinion.

A Brief Study Looking at the Effects that Positive Affirmations can have on an Adults Quality of Life

Abstract Author: April Myers
Abstract Mentor: Michael Olpin

Poster Display 6 (Session 1)
Health Promotion and Human Performance

Growing claims exist regarding how negativity can increase ones stress, weaken their health and put a strain on their relationships. This causes people to live in a world of continuously low expectations, which can affect productivity and self-confidence. Negativity can leak into every area of our lives. A voluntary survey was administered to 100 adults ages 18 and older in a variety of locations in Weber County, Utah. This survey was intended to discover how positive self-talk affected ones behavior, progression, and life. The majority of the participants surveyed strongly believed that being positive affects their quality of life. Though the majority of the people surveyed felt that being positive was beneficial for their overall wellbeing only 13 answered that they felt very positive during the time they filled out the survey. In addition to that only 11 percent felt happy all day long. Only one women felt that positive affirmations were a waste of time. If so many people believe in positive affirmations it leaves one to wonder why they do not feel positive throughout their day.

Television's Unhealthy Advertising of Food and the Impact on Childhood Obesity

Abstract Author: Rebecca Nichols
Abstract Mentor: Michael Olpin

Poster Display 17 (Session 1)
Health Promotion and Human Performance

Television viewing and attitudes varied among parents and children across different age groups, geographical regions, and genders. Personal values and practices play an important role in the amount of television viewed by families each day. A voluntary survey was administered to 100 adults with children sixteen years of age and younger at local grocery stores and markets. The purpose of the survey was to determine whether advertising unhealthy foods on television contributes to childhood obesity. The majority of the parents surveyed felt that television advertising of unhealthy foods influence children and the types of foods they eat. Eighty-five percent believed that there is a relationship between unhealthy food advertising and childhood obesity. Most of the parents (86%) felt that there was a strong relation to a higher Body Mass Index of children who viewed three or more hours of television a day.

The results indicate that most of the parents surveyed felt that the media's advertising of unhealthy foods on television did influence obesity in children. A majority of the participants (41%) agreed that eliminating unhealthy food advertising on television would make a positive impact on the obesity epidemic among children.

Attitudes Towards Complementary Alternative Medicines and its Relation to Health Status Among Weber State College Students

Abstract Author: Alyssa Orr
Abstract Mentor: Michael Olpin

Poster Display 18 (Session 1)
Health Promotion and Human Performance

This research study was done by Hana Orr, a student at Weber State University. The study was conducted at Weber State and the participants were Weber State students as well. The purpose of this study was to find if people's attitude towards Complementary Alternative Medicines (CAM) had an effect on their health Status. To find out their attitudes they were asked question that would reflect their feelings towards the effectiveness to CAM, openness to trying it, and opinions towards the insurance coverage of CAM. To find their health status they were asked question about their sick days taken and how often they missed out on events due to poor health. The conclusions were ultimately in conclusive. The correlation rate between sick days and openness towards CAM was far less than one. Although the results seemed non correlated, most of the participants were unfamiliar with CAM. This study will look through how the survey was conducted, the questions asks, results of the surveys, and a conclusion of the findings.

A Brief Study Looking at the Behaviors and Knowledge of Pregnant Women

Abstract Author: Brooke Perkins
Abstract Mentor: Michael Olpin

Poster Display 19 (Session 1)
Health Promotion and Human Performance

Nutrition is an important part of pregnancy. It is up to the pregnant woman to have an adequate diet and to take a prenatal vitamin daily to ensure the health of her unborn child. Folic Acid is a nutrient that can be vital to the well-being of the child. When taken early enough in the pregnancy can help to prevent Neural Tube Defects (NTD's) which are birth defects that occur in the brain and spinal cord. A voluntary survey was administered to 100 pregnant women ages 19-38 years using an online pregnancy forum (baby bumps section on reddit.com). This survey was intended to determine the pregnant women's knowledge and behaviors regarding nutrition during pregnancy.

The results indicate that the majority of the pregnant women (58%) knew how much folic acid they should be taking during their pregnancy (400-1,000 mcg). And they knew that it was to help prevent Neural Tube Defects. Of the 58 women who knew how much Folic Acid they should be taking 84% of those women were actually getting the recommended amount of Folic Acid daily from their prenatal vitamin. They were pretty knowledgeable about Folic Acid and seemed to be trying to get the right amounts.

Attitudes and Behaviors of College Students Regarding Body Size and Perceived Body Image in Relation to Personal Health Practices

Abstract Author: Holli Rackham
Abstract Mentor: Michael Olpin

Poster Display 20 (Session 1)
Health Promotion and Human Performance

In our American, individualistic culture, there is a high value on a body that is not only thin, but in most cases- unrealistic. These unrealistic ideals are the driving force behind crash dieting, over exercising, inaccurate perceptions of body size, poor self-esteem, and in some cases disorders like anorexia and bulimia. One hundred and one students at Weber State University were asked to participate in a survey regarding their perceptions of exercise, dieting, and their own body image in hopes of finding out if their perceptions were accurate and if their perceptions were related to other health behaviors and attitudes. Students were asked to report age, height, and weight to discover their BMI. They were also asked questions regarding their attitudes and behaviors surrounding their own body weight and healthy activities. Over 65 percent of the students who responded were accurate in their body perception. The group of students who were the most accurate in their body perceptions were those of a normal BMI, 42.6 percent, followed by the overweight group at 18.8 percent. Those students with a healthier weight and those with healthy attitudes in regards to diet and exercise were the most accurate in their body image perceptions.

Stress Management among Weber State Students

Abstract Author: Cassi Skinner
Abstract Mentor: Michael Olpin

Poster Display 21 (Session 1)
Health Promotion and Human Performance

College life is often stressful and more likely than not, adds to everyday life stresses of students. Even more in depth, students and people overall tend to deal with their stresses differently. In this study, a voluntary survey was administered to 100 Weber State University students that ranged in age from 18-34 or older. This survey was intended to obtain information about what college students stress levels are and what they do to relieve and/or cope with their stress. The results indicated that their stress levels on scale from 1-5 (5 being extremely stressed), on average was 3.2. The majority of students said that they have an idea of how to manage their stress and they usually exercise, use time management and positive self-talk to ease their stress.

A Comparative Study of Youth and Parent/Guardian Perceptions of Risk Factors that Lead to Adolescent Delinquency

Abstract Author: Todd Spencer
Abstract Mentor: Wei Qiu

Oral Presentation (Session 2)
Child and Family Studies

There has been a great deal of research looking at the risk factors that contribute to adolescent delinquency, but there has been insufficient research comparing the perceptions of both the youth and their parents of what risk factors led to criminal behavior. To test parent and delinquent agreeableness, 36 parent and youth pairs from Salt Lake Peer Court were given surveys looking at family relationship dynamics, aggressive and depressive emotions, the presence of drug use, the role and influence of peers, school participation, and academic achievement. The results suggest that adolescents and parents have a high level of agreeableness to what risk factors led to risk behaviors. Additionally, parents who reported arguing with their spouses frequently were less likely to know where their child is, what they are doing and whom they are associating with.

Knowledge, Attitudes, and Behaviors of Women Regarding Folic Acid Supplementation During Pregnancy

Abstract Author: Chandra Tanner
Abstract Mentor: Michael Olpin

Poster Display 22 (Session 1)
Health Promotion and Human Performance

Folic Acid is a vitamin commonly found in fruits and vegetables as well as many enriched grain products, but do many women know that consuming this seemingly insignificant vitamin can reduce the risk of neural tube defects, in a fetus, by about 91%? The nature of this study was to discover the knowledge, attitudes, and behavior of women regarding their intake of folic acid, prior to becoming pregnant, as well as during pregnancy. A survey was administered to 86 women each of which were asked to share their knowledge, attitudes and behavior regarding folic acid use. The women that participated in this study were either planning on becoming pregnant, were in the early stages of pregnancy, or recently had a baby. It was found that most women (55%) knew how much folic acid they needed during pregnancy. The majority of women (93%) knew the risks that could come from folic acid deficiency, and the majority of women (99%) were taking folic acid supplements during the first trimester of pregnancy. The results of this study suggest that most women believe folic acid supplementation is vital during pregnancy and that women should be encouraged to supplement during early pregnancy.

A Study of the Effects of Music on Stress

Abstract Author: Jessica Thorpe
Abstract Mentor: Michael Olpin

Poster Display 23 (Session 1)
Health Promotion and Human Performance

Music is a powerful tool in many aspects of life. It has been used throughout history as a means to bring people closer, bring about change, and celebrate. Today music is used in similar ways. It brings people together, gives people a way to identify themselves, and aids in celebrating special occasions. A voluntary study was conducted to find if music could also be an aide to people in times of stress. This survey was administered to 100 individuals at Weber State University comprised of males and females ranging in ages 18-34. Results showed that a majority of the participants said they always used music as a means to feel better when they were stressed. The results also showed that more than half of the participants agreed they felt relief when listening to music after a stressful day. This was apparent by the number of times the participants listened to music in a day. The highest responses were listening to music ten or more times per day. The highest genres of music listened to were pop, alternative, and rap. New age, hard rock, and meditative were in the lowest numbers of listened to genres. Although the majority of the people listened to music to relieve stress, an interesting discovery was the responses of non music use.

Technology: For Better or For Worse?

Abstract Author: Brogan Van Patten
Abstract Mentor: Wei Qiu

Poster Display 24 (Session 1)
Child and Family Studies

The purpose of this study is to examine several aspects of cell phone use in University classrooms. This study was designed to measure correlations between attitudes towards cell phone use in the classroom, the purpose of using a cell phone in a classroom, views of cell phones being a distraction, and gender differences. To identify and measure correlations a survey was designed that consisted of questions regarding student's cell phone use in the classroom. The questions were devised to measure your hypotheses which include:

“The relationship between college students” attitude towards cell phone use and purposes of using cell phones in the classroom.

“The relationship between college students” attitude towards cell phone use and their views of cell phone being a distraction.

“The relationship between college students” purposes of using cell phones in the classroom and their views of cell phone being a distraction.

“The gender differences in college students” attitudes towards cell phone use, purposes of using cell phones in the classroom, and views of cell phone being a distraction.

A Brief Study of the Attitudes and Behaviors of Healthy Adults Regarding the Flu Shot

Abstract Author: Anni Varga
Abstract Mentor: Michael Olpin

Poster Display 25 (Session 1)
Health Promotion and Human Performance

The flu shot is recommended to all individuals ages 6 months and older. Research continues to be conducted on the safety of the vaccine across different age groups and the attitudes of those choosing not to be immunized. With the flu shot having a variety of side effects, coming to know that it cannot prevent secondary illnesses and having knowledge that prevention of the flu can take place through other non-invasive means, many individuals are choosing to not receive the flu shot. This study was a survey designed to gather information about behaviors and attitudes of adults regarding flu shots. The majority of those surveyed (38%) feel that receiving a flu shot is beneficial for their overall health and even more (43%) feel it is effective. Interestingly, half (50%) do not feel that the flu shot is safe for everyone. Of those surveyed, 32% receive a flu shot every year and 29% never receive a flu shot. Of those who receive a flu shot every year, they reported having the flu 1-2 times in the past five years. Of those who never receive a flu shot, they also reported having the flu 1-2 times in the past five years.

The Beliefs and Attitude of Weber State University Students Regarding the Effects of Stress on Academic Success

Abstract Author: Velda Warner
Abstract Mentor: Michael Olpin

Poster Display 26 (Session 1)
Health Promotion and Human Performance

Stress is a part of our everyday life and can affect us in many ways. A survey was administered to a hundred students ages nineteen and older on the campus of Weber State University. This survey sought to find out the attitudes and beliefs of college students regarding how stress affects their academic success.

The majority of participants believe that stress has negative effects on academic success and that it is important for them to manage their stress effectively to be able to succeed. Forty-four percent said students should sometimes use stress management techniques to manage their stress levels. The majority said that their stress levels are about the same compared to other college students. Fifty-eight percent said that they let stress have somewhat of an effect on their academic performance. The majority said that they have not dropped a class because they were too stressed to continue taking it.

The results indicate that most WSU students have the belief that stress has an effect on their academic success and that they need to manage their stress to be able to succeed academically. Also, that the participants feel that their stress levels compared to other students is about the same.

The Effects of Employment on College Students' Academic Performance

Abstract Author: Michelle Washburn
Abstract Mentor: Wei Qiu

Oral Presentation (Session 2)
Child and Family Studies

The purpose of this study is to examine in what ways paid employment influences academic performance during the college years. Factors that intervene with the relationship between employment of college students and their academic performance were investigated. The population consisted of college students at Weber State University who were at least 18 years of age. No other restrictions existed to define our sample. The factors involved in examining employment (e.g., part-time vs. full-time employment) and its effects on academic performance (e.g., college students' GPA) will further outline the conflicts within the relationship between employment and academic performance. This study was not able to prove significant causal relationships based on our hypotheses. Our study did, however, find several significant correlations between the impact of employment and academic performance.

Dumke College of Health Professions

Adult Client Recall of Oral Health Education Services in an Educational Setting

Abstract Author: McKinlei Acord
Abstract Mentor: Frances McConaughy

Poster Display 4 (Session 2)
Dental Hygiene

A patients' ability to recall oral hygiene instruction is significant in improving and maintaining the status of overall health care. Prior research suggests that health care providers, specifically dental hygienists, might not be incorporating successful teaching methods or learning strategies geared towards each patient and their individual needs (McConaughy, Lukken, & Toevs, 1991; 1995). Moreover, this research demonstrated that adult patients' recall of such instructions given by the dental hygienist in the private practice setting is of low frequency. The purpose of this study was to investigate and determine adult clients' recall of oral health education services received in an educational setting. Forty-five participants ages 18-70 were selected by a convenience sample. The data was collected through use of a questionnaire regarding oral hygiene education administered to patients in the Weber State University Dental Hygiene Clinic. The results of this study are currently being analyzed and will include descriptive statistics and cross tabulations. The final results and conclusions will be completed for presentation at the Undergraduate Symposium in March.

Pre-Use Validation Study of the Wescor Vapro Vapor Pressure Osmometer

Abstract Author: Elizabeth Borg
Abstract Mentor: Ryan Rowe

Poster Display 5 (Session 2)
Medical Laboratory Science

This project will consist of completing a pre-use validation study for the WSU Medical Laboratory Science Department. This validation study will be performed on a Wescor Vapro Vapor Pressure Osmometer. Using serum controls a within-run study, run-to-run study, and a precision study will be performed and a quality control range determined. Using manufactured calibrators the accuracy, linear range, and minimum detection limit will be established. Pre-use validation is an essential part of laboratory quality control. In order for a machine to give correct patient values, it must be correctly calibrated and ranges determined before using it for patient results. It is expected that our findings will correlate with manufacturer specifications.

Rapid Bacterial Detection in Platelet Units Using Limulus Amebocyte Lysate

Abstract Author: Adam Briscoe
Abstract Mentor: Matthew Nicolaou

Poster Display 6 (Session 2)
Medical Laboratory Science
Nye Undergraduate Research Scholarship

Bacterial contamination in platelet units remains one of the most common causes of patient sepsis and death related to transfusions. Current methods of bacterial detection in platelets are ineffectual, causing erroneous results in pre-transfusion screens. Recent research has shown some success in developing improved screens for bacteria in platelets, however, these methods are expensive and time-consuming. This research will implement an inexpensive, rapid, pre-transfusion screen for bacterial contamination in platelet products utilizing Limulus amebocyte lysate (LAL). Polymerase Chain Reaction (PCR) will be used to verify the LAL screen. Expired platelet units will be acquired and screened for bacteria using LAL, and PCR will then be used for verification of the results. The units will then be spiked with *Escherichia coli* or *Staphylococcus epidermidis*. The above methods will then be repeated. By utilizing LAL, a rapid and less-expensive method for detection of both Gram negative and Gram positive bacteria could be implemented pre-transfusion, preventing sepsis and deaths from bacterially contaminated platelet units.

Microbial Contamination on Photoostimulable Phosphor Plates

Abstract Author: Kristin Twede, Cesia Newton, Sierra Hull & Danielle Chugg
Abstract Mentor: Frances McConaughy

Poster Display 7 (Session 2)
Dental Hygiene

There are over seven hundred types of bacteria that reside in the mouth, however not all of them are pathogenic (Aas, Paster & Stokes, 2005). Cross-contamination can occur at any point when using intra-oral imaging, but particular concerns have been raised to the use of photostimulable phosphor (PSP) sensors (Kalathingal, et al., 2009, 2010; Negron, et al 2005). PSP plates can become contaminated even though they are placed into barriers. Most manufacturers' disinfection guidelines have been unclear. The purpose of this study is to evaluate the best protocol to decrease bacterial contamination. Two disinfecting methods will be evaluated post-exposure of PSP plates. One method includes a dry wipe of barrier before removal. The second group will also incorporate a dry-wipe protocol, followed by an additional wet wipe protocol using PDI Sani-cloth HB before barrier removal. These two experimental methods will be compared for effectiveness of bacterial reduction. It is hypothesized that contamination will be reduced when following manufacturers guidelines of PDI sani-cloth HB. Investigation is still being conducted and results will be available prior to Symposium.

Elevated Alanine Aminotransferase (ALT) in the Deceased Donor: Impact on Early Post Transplant Liver Allograft Function

Abstract Author: Jason Davis
Abstract Mentor: Travis Price

Oral Presentation (Session 2)
Medical Laboratory Science

Serum alanine aminotransferase (ALT) levels are frequently elevated with liver injury and are common in non-living organ donors. The impact of these elevations on early liver allograft function has not been well described. This study analyzes the immediate function and 1-year graft patient survival for liver allografts stratified by peak serum ALT levels in the deceased donor. Organ procurement records for 1348 deceased liver donors were reviewed. Serum ALT was categorized into 3 study groups: normal/mild elevation, 0-499u/L; moderate elevation, 500-999u/L (>10x upper limit); severe elevation, ≥ 1000 u/L (>20x upper limit). Outcomes included early graft function and graftloss, as well 1-year graft and patient survival. Distribution of subjects included: normal/mild, 1259 (93%); moderate, 34 (3%); severe, 55 (4%). Risk of 30-day graft loss for the 3 study groups was: 72 (6%), 3 (9%), 3 (6%). Graft and patient survival at 1-year for the 3 groups was: normal/mild, 1031 (87%), 1048 (88%); moderate, 31 (91%), 31 (91%); severe, 43 (88%), 44 (90%). This study demonstrates clinical equivalence in early graft function and 1-year graft and patient survival for donor livers with varying peak levels of serum ALT. These donors allografts may, therefore, be utilized successfully under certain circumstances.

Effects of Glucose on Swarming Motility of *P. mirabilis*

Abstract Author: Karlee Emal
Abstract Mentor: Scott Wright

Oral Presentation (Session 2)
Medical Laboratory Science
Denkers Undergraduate Research Scholarship

Proteus mirabilis, when colonizing the urinary tract, can cause cystitis, acute pyelonephritis, and urinary stones. *P. mirabilis* forms biofilms and has cyclic swarming growth on solid media, facilitated by multicellular rafts of hyper-flagellated cells. Research shows glucose enhances *P. mirabilis* biofilm formation. Additionally, diabetics have increased risk of urinary tract infections, presumably due to increased saccharides in urine, suggesting glucose availability plays a role in *P. mirabilis* uropathogenesis. This research aims to determine effects of glucose availability on *P. mirabilis* motility by examining growth rates, flagella structure, and swarming rafts. *P. mirabilis* swarming has two cyclic phases: swarming and consolidation. Differences in motility rate and overall duration of each phase will be determined on agars with and without glucose, using a camera mounted in the incubator. Swarming rafts will be captured using scanning electron microscopy, allowing inspection of flageller helical connections. Flagella quantity and morphology will be assessed using silver nitrate stain. It is reasonable to suspect in the presence of glucose, *P. mirabilis* increases its rate of swarming by increasing activity of multicellular rafts via the production of hyper-flagellated cells, supporting an association between increased UTIs and glycosuria.

Microbial Contamination on Electronic Devices in the Dental Hygiene Environment

Abstract Author: Mark Harris
Abstract Mentor: Frances McConaughy

Poster Display 8 (Session 2)
Dental Hygiene

Infection control practices to control or reduce cross contamination of pathogenic microbes have been established for many medical and dental procedures. However, the advent of touch input technology (eg. tablets, keyboards, etc.) has made these infection control practices more challenging. Moreover, the portability of these devices and the multi-user potential has complicated these infection control practices and potentially contributing to cross contamination for both clinicians and patients. In a review of the literature, one group of researchers who examined 200 mobile phones from a hospital found that 94.5% of the phones demonstrated evidence of bacterial contamination (Ulger et al., 2009). The purpose of this study is to test for pathogens on keyboards and mobile phones to identify possible contamination. The devices will be wiped with a sterile dry swab. Each swab sample will then be plated onto a trypticase soy agar plate with 5% sheep blood where it will be incubated at 37°C for 48hrs. The samples of bacteria will be identified and the amount of each species. Results may indicate for newer sterilization/disinfecting protocols when dealing with these devices in the dental hygiene setting.

Comparison of Tooth Soap and Colgate on General Oral Health

Abstract Author: Anja Greenhalgh
Abstract Mentor: Matthew Nicholaou

Oral Presentation (Session 1)
Medical Laboratory Science
Eccles Undergraduate Research Scholarship

Tooth Soap is an all-natural alternative to standard toothpaste that is marketed as being healthier and safer than fluoride toothpaste. It contains only natural oils, water, salt, and essential oils. To determine if there is a significant difference between Tooth Soap and Colgate on oral health, a two-group cross-over study of 27 Dental Hygiene students will be used. Oral health will be assessed using salivary pH, plaque growth, and growth of *S. mutans*. These factors will be measured over a four week period with a total of three oral exams. After a preliminary exam, Group 1 will begin the study period using Tooth Soap for two weeks and Group 2 will be using Colgate during the same two weeks. An intermediate oral exam will be given to both groups following the treatment. Both study groups will then switch products for the final two weeks of the study, which will be followed by a post oral exam. Participants will take a post-experiment survey concerning preference of Tooth Soap or Colgate and any other changes they may have noticed between products. It is expected that there will be no statistically significant difference in oral health between Tooth Soap and Colgate.

Alpha-1 Antitrypsin And The Diagnosis of Exercise-Induced Bronchoconstriction

Abstract Author: Richard John
Abstract Mentor: Ryan Rowe

Oral Presentation (Session 2)
Medical Laboratory Science
Eccles Undergraduate Research Scholarship

Exercise-induced bronchoconstriction (EIB), generally known as exercise-induced asthma, is a commonly diagnosed pulmonary disease. The objective of this study is to determine if a positive correlation exists between the diagnosis of EIB and genetic variations of alpha-1 antitrypsin (AAT). AAT is a protein produced by the liver that inhibits a number of enzymes, specifically one found in the respiratory system known as human neutrophil elastase (HNE). Malformations of the AAT protein, due to variations of the individual's genotype, results in the inability to completely inhibit HNE. This can lead to a chronic breakdown of host tissue resulting in an increased likelihood of respiratory problems including wheezing, asthma, and emphysema. Participants who have previously been diagnosed with EIB and a control group will be screened for the different phenotypes of AAT. Results will be analyzed to determine if there exists a correlation in the frequency of the various alleles for AAT among those diagnosed with EIB when compared to the control group. The expected results will demonstrate a positive correlation between the diagnosis of EIB and phenotypic variations of AAT. This will establish that many who have been diagnosed with EIB may actually be suffering from some form of AAT deficiency.

Prevalence of Escherichia coli O157:H7 in Grain fed Cattle and the Implications to Public Health

Abstract Author: Michelle Kimball
Abstract Mentor: Scott Wright

Oral Presentation (Session 1)
Medical Laboratory Science
Eccles Undergraduate Research Scholarship

The novel strain of *Escherichia coli* O157:H7 was positively identified in 1975 and then subsequently as a human pathogen in 1982. This strain has the ability to produce toxins and adhere to endothelial cells lining the digestive tract of humans causing illness ranging from bloody diarrhea to the life threatening condition, hemolytic uremic syndrome. Cattle are known to be the primary reservoir of the bacteria with the transmission to humans occurring through direct contact, meat and milk products, and through manure contamination of water and field crops. This disease currently affects more than 73,000 people annually in the U.S. causing approximately 200-500 fatalities each year with financial costs reaching an estimated 726 million dollars each year. There is concern that the practice of feeding grain to cattle leads to an increase of digestive acidity, which could possibly enhance the growth *E. coli* O157:H7. The objective of this research was to determine if *E. coli* O157:H7 could be isolated from cattle raised in the northern Utah area and if the occurrence of the strain was more prevalent in grain fed cattle. Four farms were studied: two that feed their cattle a grain-based diet, and two that feed a grass-based diet. The presence of the O157 and the H7 antigens were detected in 2 out of 107 grass fed samples (1.8%), and 6 out of 94 grain fed samples (6.3%).

An Assessment of Magnification Loupes in Weber State University's Dental Hygiene Program

Abstract Authors: Leisa Alsop, Karlie Burton, Marcella Leakehe
Abstract Mentor: Frances McConaughy

Poster Display 9 (Session 2)
Dental Hygiene

Dental hygiene is an occupational field laden with musculoskeletal disorders(MSD). In fact, one study found that 93% of dental hygienists experience at least one musculoskeletal disorder, with nearly 68% reporting pain in the neck and upper back regions (Anton, 2002). While the use of magnification loupes have been used to help reduce the prevalence of this disorder, few studies discuss the use of loupes in the educational setting. Given the limited information on the use of loupes in Dental Hygiene programs, the purpose of this project was to assess the implementation of loupes in the Dental Hygiene Program at Weber State University. Senior Dental Hygiene students served as participants in this study and first completed a questionnaire related to their experience with using loupes. From this group, ten students were videotaped using the loupes in a clinical setting and their body posture was evaluated and rated according to a posture scale. Inter-rater reliability was established prior to evaluation and scoring. Data collection is near completion and the results will be compiled for presentation at the Undergraduate Symposium. The results will provide information to faculty and other students about posture and implementing magnification loupes in an educational setting.”

Paramount Importance of Pediatric Oral Health

Abstract Author: April Lewis
Abstract Mentor: Frances McConaughy

Poster Display 10 (Session 2)
Dental Hygiene

Dental caries is the most common chronic disease in children and the importance of a child's oral and overall health starts even before the child is born. Recent research also indicates that childhood caries is on the rise, especially in young children. A large portion of dental hygiene care is directed toward education and prevention of such diseases, but parental involvement and supervision is necessary and pivotal for infant and early childhood caries prevention. Little is known about parental knowledge of caries and related care strategies they provide for their children. This study is designed to assess parental knowledge of pediatric oral health at two different dental care settings and determine if there are differences in parental knowledge at these two settings. Participants were randomly selected for inclusion in the study. Demographic data and an assessment of parental knowledge were obtained by using a one page questionnaire. The results are currently being analyzed and will be completed for presentation at the Research Symposium.

Using epMotion to Reduce Cross-Contamination During Viral RNA Extraction in Real Time PCR

Abstract Author: TJ McIntosh
Abstract Mentor: Scott Wright

Oral Presentation (Session 2)
Medical Laboratory Science

West Nile Virus (WNV) is a pathogen that can lead to serious illness and is typically spread by mosquitos. According to the Center for Disease Control, there have been more than 30,000 reported human cases in the U.S. since 1999. The Unified State Laboratories: Public Health, Utah's only public health lab, in conjunction with Utah's various mosquito abatement district offices, tests mosquitoes for WNV in an attempt to help prevent spread of the disease by determining areas of high risk. WNV is detected using real time polymerase chain reaction techniques performed on pools of mosquitoes submitted from throughout the state. The first step in this process is to extract the viral RNA from the sample. Cross-contamination can be a common error during the extraction process. One way of reducing contamination errors is by using an automated pipetting instrument. This research will compare the relative likelihood of cross-contamination between automated extraction using an epMotion machine and manual extraction methods. During the extraction step of the procedure, WNV positive and negative residual mosquito lysate will be pipetted in duplicate using both the epMotion system as well as manual pipetting each specimen. Polymerase chain reaction will be run on both sets of extracted samples to compare accuracy and contamination of the two methods. It is expected that using the epMotion automatic pipetting system will decrease contamination rates while maintaining accuracy, ultimately resulting in increased specificity and fewer errors in the detection of WNV.

Glucose Metabolism in Group O and Non-O Blood Types

Abstract Authors: Britton Odle, Callie Odle, Paulette Padilla & Daniel Savage
Abstract Mentor: Matthew Nicholaou

Oral Presentation (Session 2)
Medical Laboratory Science
Gardner Undergraduate Research Scholarship

Recent research indicates a significant difference between ABO blood types and the likelihood of developing various diseases such as pulmonary embolism, chronic heart disease, and pancreatic cancer. These studies indicate patients with group O blood have the lowest risk of developing these conditions. Two hour glucose tolerance tests were used to evaluate the efficiency of glucose metabolism in 60 individuals (30 group O and 32 group non-O). Multivariate linear regression was used to detect statistically significant differences between group O and non-group-O patients with non-group-O metabolizing glucose less efficiently. The results of this study have significant implications for the prevention of developing type-two diabetes. We are still in the final stages of the project.

Sealant Longevity: An Evaluation of Weber State University Dental Hygiene Sealant Clinics

Abstract Author: Jacque Rivas
Abstract Mentor: Frances McConaughy

*Poster Display 11 (Session 2)
Dental Hygiene*

The CDC Division of Oral Health (2011) has indicated that dental sealants can reduce decay in school children by more than 70 percent. Some researchers suggest that sealants have the potential of lasting as long as 10 to 15 years (Messer, 1997). The purpose of our study is to evaluate the retention rate of the sealants placed at the WSU community clinics in the 2011-2012 school years. Over 200 sealants from 65 children have been identified for follow up procedure and data collection will include qualitative retention information (eg. full/partial retention) about the sealants or loss to decay. Importantly, assessing the retention rates of the sealants will provide valuable feedback for the effectiveness of the sealant program. The data analysis is in process and results will be available for presentation at the Research Symposium.

Oral Piercings: What do Patients Know and what do Body Modification Studios Tell Them?

Abstract Author: Ashlee Shemenski
Abstract Mentor: Frances McConaughy

*Poster Display 12 (Session 2)
Dental Hygiene*

Oral piercings have increased in popularity in recent years. There is a lack of awareness in the general population of the potential complications associated with oral piercings, and consultations with dental or medical professionals are rarely sought. Potential complications from oral piercings include broken/chipped teeth, inflammatory reactions, bleeding, bone loss, tooth mobility, and gingival damage (Miles, 2003, pg. 8). Further, the literature has documented life-threatening complications. This project was designed to investigate the information given to patients receiving oral piercings. Two surveys were developed to elicit complications related to oral piercings. The first survey was completed by patients with oral piercings, and the second survey was completed by personnel from body modification studios. Initial results confirm that minimal information is sought by people receiving the piercings, and that body modification studios provide minimal information with the exception of fractured teeth. We are in the process of determining what information needs to be provided to improve patient knowledge of oral piercings. Final data will be available for the symposium presentation.

Antimicrobial Properties of Essential Oils for Surface Disinfecting

Abstract Author: Sherry Sorenson
Abstract Mentor: Matthew Nicholaou

*Oral Presentation (Session 1)
Medical Laboratory Science
Denkers Undergraduate Research Scholarship*

Studies have shown that essential oils contain chemical compounds with broad antimicrobial properties. This research aims to further these studies by testing the possible disinfecting properties of lemon, geranium, clove, cinnamon, and rosemary essential oils. Culture plates were inoculated with four organisms that are commonly acquired by patients during hospital stays. These four organisms, *E. coli*, *P. aeruginosa*, *E. faecalis*, and *S. aureus*, were separately inoculated on culture plates and individually treated by each of the five essential oils. The oils that showed antimicrobial activity were selected to test for their disinfectant properties on surfaces commonly found in laboratory and hospital settings. Water and bleach were used as controls for this phase of testing. The surfaces were inoculated with organisms, then treated with a known concentration of oils, then swabbed at five separate time intervals. These swabs were used to inoculate culture plates that were incubated for 24 hours. The antimicrobial activity of each essential oil was based on the organism growth on the culture plates. The surfaces were re-inoculated at 24 hours to test the continued antimicrobial activity of the oils against the organisms. After phase one of testing lemon and rosemary showed no antimicrobial activity against the organisms.

Are Womens Eating Habits Affected by Stress?

Abstract Author: Jenna Stuart
Abstract Mentor: Michael Olpin

*Poster Display 13 (Session 2)
Health Promotion*

Eating habits and stress levels vary throughout the world among different cultures and different age groups. Environmental factors and individual preference play a role in individual and group eating habits and stress levels. A voluntary survey was administered to 100 women on face book. This survey was intended to see if there was a correlation between women's eating habits related to their stress levels. The majority of participants were between the ages of 18-25. Sixty six percent said that they sometimes tend to eat less healthy foods when they become stressed. An eight was the highest percentage of people at 22 they said crave unhealthy foods when they are stressed. It was pleasing to see that 54 percent of the women said that they sometimes use methods of stress management. this answers to this question were a bit more spread out but the high one was 21 percent with an 8 saying there were pretty much aware of how much they were eating.

After going over all the survey I was so pleased with the results it. I felt like I got some really good data. It a very interesting topic that I feel like a lot of women have a real struggle. I wonder if men have to same struggles and women do but I chose to do all women because I feel like more eating fell into bad eating habits when they became stressed.

Methamphetamine: What Do Dental Hygienists Know?

Abstract Author: Amanda K. Chugg, Marie Pontius & Misty L. Toupin
Abstract Mentor: Frances McConaughy

*Poster Display 14 (Session 2)
Dental Hygiene*

The abuse of Methamphetamine (Meth) impacts a wide variety of the population both directly and indirectly. Within the dental setting, dental hygienists are often the first point of contact for patients with a history of Meth use. Hygienists are in a unique position to be the first to educate patients on the detrimental effects of Meth and provide resources for intervention. However, little is known about hygienists' knowledge level of potential Meth users or former users. We investigated the knowledge base of licensed Dental Hygienists from the Northern Component of the Utah Dental Hygienists' Association. Utilizing a web based survey format, qualified subjects were invited to complete an online questionnaire regarding their recognition of Meth use, signs, symptoms, appropriate treatment alterations, and personal in-office experiences with patients. Analysis of the data is currently underway. Final results will be completed for presentation and discussion at the time of the Undergraduate Symposium.

Dental Hygienists? Knowledge and Teaching Practices Regarding Diabetes and Periodontal Disease

Abstract Author: Jennifer Ulrich
Abstract Mentor: Frances McConaughy

*Poster Display 15 (Session 2)
Dental Hygiene*

The medical and dental literature supports a relationship between oral disease and other systemic diseases. Both periodontal disease and diabetes are chronic inflammatory diseases and the relationship that exists between them is bi-directional (Lopes, Southerland, Buse, Malone, & Wilder, 2012). For example, patients with diabetes who have poor glycemic control are more susceptible to infection in the periodontium. While both medical and dental health care providers have knowledge of these two diseases, there is little evidence that these providers share this knowledge with their patients. Further, there is minimal information about the medical and dental providers own knowledge level regarding the bi-directional relationship between diabetes and periodontal disease. The purpose of this research is to ascertain the knowledge level of a group of dental hygienists about the relationship between diabetes and periodontitis and the extent of health related information that they provide to their patients who have diabetes. Participants are licensed Dental Hygienists who have been asked to complete an online survey designed to address the stated purposes of this project. Responses to the online survey are currently being evaluated and will be analyzed and completed for presentation at the Undergraduate Research Symposium in March.

Attitudes and Behaviors of Expecting Mothers Regarding Fluoride in Drinking Water.

Abstract Author: Mary White
Abstract Mentor: Michael Olpin

Poster Display 16 (Session 2)

The surveys objective was to find out the awareness that pregnant women had about the potential adverse effects of fluoride and how it affected them and their developing child but also was to find out their attitudes toward changing their habits to protect themselves and their child from the consumption of too high of levels of fluoride. The survey was taken by 42 pregnant women through online Utah pregnancy support forums. What I found out was that the majority of pregnant women that took that survey were not aware of the negative effects of consuming high levels of fluoride. It appears that women are not concerned with consuming high amounts of fluoride in their diet as fluoride is aggressively promoted by proponents as having "positive" effects on teeth.

Synergistic Effects of Essential Oils and Antimicrobials against Drug Resistant Bacterial Pathogens

Abstract Author: Ryan Wilcox
Abstract Mentor: Scott Wright

*Oral Presentation (Session 1)
Medical Laboratory Science
Nye Undergraduate Research Scholarship*

Drug resistant strains of bacterial pathogens have become a rising concern within the medical community due to the overuse of antimicrobials. A significant amount of research is currently being performed to enhance the effectiveness of antimicrobial treatments. Essential oils have been shown in previous studies to have antimicrobial properties, however, little research has been done to show synergistic effects of essential oils with current antimicrobial treatment. The goal of this study is to investigate the potential synergistic effects of six essential oils in conjunction with antimicrobials used in the clinical treatment of resistant bacterial pathogens. Essential oils of known concentrations will be tested against four species of drug resistant bacterial pathogens using a micro dilution method. The varying dilutions will be added to antimicrobial micro scan plates that contain standardized concentrations of 20-24 frequently used antimicrobials. The minimum inhibitory concentration (MIC) will then be determined. We are hoping to find a statically significant synergistic effect of essential oils used in conjunction with antimicrobials. These results could potentially have an impact on improving the clinical effectiveness of antimicrobial therapy.

Undergraduate Research

Cholesterol and Triglycerides Assay Validation

Abstract Author: Alena Yarema

Abstract Mentor: Ryan Rowe

Poster Display 17 (Session 2)

Medical Laboratory Science

Validation of medical laboratory equipment is required by Centers for Medicare and Medicaid Services, as per the Clinical Laboratory Improvement Act in order to ensure the patient results are accurate. This validation is going to be performed on the ACE analyzer in the Medical Laboratory Sciences department at Weber State University. This is done to ensure that the correct results are obtained from total cholesterol and triglyceride assays. Two methods, cholesterol oxidase and glycerol kinase, are used for total cholesterol and triglycerides assays, respectively. The process of validation involves precision, accuracy, minimum detection limit, linear range, QC range, and a correlation and regression study. It is important to understand the functions of cholesterol and triglycerides in the human body. Triglycerides are blood lipids necessary for transfer of the adipose fat and blood glucose. Cholesterol is an important lipid for cell membrane permeability and fluidity, as well as synthesis of steroid hormones in the body. Therefore the body has to maintain certain levels of these substances for proper function. If the levels of either one of these lipids are elevated, a wide variety of serious illnesses may occur. Proper and accurate evaluation of cholesterol and triglycerides is desired for prevention of these unwanted consequences.

College of Science

The Importance of DNA Evidence Packaging

Abstract Author: Rachel Augsburger
Abstract Mentor: Michele Culumber

Oral Presentation (Session 2)
Microbiology/Forensic Science
Nye Undergraduate Research Scholarship

DNA evidence is an important part of forensic evidence, but if improperly packaged the end result can be devastating to the case and the evidence itself. In this research procedure six volunteers will give buccal sample swabs that will be placed in plastic bags and paper envelopes. Their 'evidence' will then be left at room temperature for 24 hrs, 48hrs, four days, one, two and four weeks. At the end of the specific time period swabs from both types of packaging will be evaluated for bacterial and fungal growth on TSA agar. One swab from each package will be processed through an 'UltraClean Forensic DNA Isolation Kit' to determine if the buccal cells contain a usable and sufficient amount of DNA to be ran on an agarose electrophoresis gel. These samples will then be ran on an agarose gel to determine the amount of DNA in the sample. Through this study the standard of how biological evidence should be properly packaged will be achieved.

This is an on going research project that will be completed by the middle of March. Data is currently being collected.

Antibiotic Resistance of Enterococci Isolated from the Great Salt Lake and Fresh Water Sources

Abstract Author: Ashley Badley
Abstract Mentor: Karen Nakaoka

Oral Presentation (Session 2)
Microbiology
Eccles Undergraduate Research Scholarship

Enterococcus, a bacterial genus that normally inhabits the gastrointestinal tract of animals, can be pathogenic to humans, causing urinary tract infections, sepsis and other serious diseases. It is also one of the major causes of hospital acquired infections. One important complication of Enterococcus infections is that they often have a high level of antibiotic resistance, making effective treatment of patients more difficult. While it is a normal inhabitant of the gastrointestinal tract, it can survive outside its host in the environment, even in adverse conditions, such as hypersaline environments. In this experiment, 73 isolates of Enterococcus were collected from the Great Salt Lake and 52 from fresh water sources. These isolates were examined for different phenotypic characteristics and for their antibiotic resistant patterns using ciprofloxacin, erythromycin, tetracycline, vancomycin and gentamycin. The results of the Kirby Bauer disk-diffusion assay revealed a significant difference ($p < 0.05$) in resistance to at least one antibiotic between isolates from the Great Salt Lake and freshwater sources (48% versus 15%, respectively). Analysis revealed significant differences ($p < 0.05$) between the isolates from these water sources for resistance to gentamycin and tetracycline. These findings may have implications for those who have recreational and occupational contact with the Great Salt Lake.

In Situ Measurement of Stratospheric Ozone Above Utah's Uintah Basin

Abstract Author: Rosana Baldraco
Abstract Mentor: John Sohl

Poster Display 18 (Session 2)
Physics

Although well publicized, measurements of Earth's ozone layer are actually very limited. Ozone-layer measurements are of three types, vertical column, horizontal column, or in situ. Column measurements do not provide good distribution information along the length of the column although they do provide global scale data. In situ measurements are spotty and limited to high altitude balloon flights and occasional high-altitude ER-2 plane flights. We have assembled a system to fly an ozonesonde (same as utilized by NOAA) along with other instrumentation into the stratosphere with the goal of measuring ozone to approximately 35km above sea level. We currently have a live telemetry system that relies on the sound card of the computer being used. That approach seems to work well but it varies in efficiency from one computer to another. We are working on replacing that method by using a modem. The radio-sonde signal-to-noise ratio is being tested by assessing possible changes in the geometry and length of its current antenna for better transmission. Weber State University's HARBOR (High Altitude Reconnaissance Balloon for Outreach and Research) 2012 flight season data are consistent with comparable NASA data. Results, current methodology, hardware system improvements and antenna testing will be presented.

Determination of Microbial Populations in a Synthetic Turf System

Abstract Author: Jason Bass
Abstract Mentor: Craig Oberg

Poster Display 19 (Session 2)
Microbiology
Gardner Undergraduate Research Scholarship

There is growing concern regarding the contribution of infilled turf fields on the increase of athlete infections. Abrasions that occur on these fields create a port of entry for pathogens such as *Staphylococcus aureus*. This study has compared the occurrence of microbial populations on infilled turf fields. Synthetic turf was tested in three locations on two separate fields, one that is new, and another that is older. The fields were sampled on the sidelines, in the middle of the field, and at the end of the field. Tryptic Soy Agar was used to count total microbial load, Mannitol Salt Agar was used to measure the amount of *Staphylococcus aureus* present, and Eosin Methylene Blue Agar was used to count the number of enterbacteric organisms such as *Escherichia coli*. A considerable increase of microbial populations was shown on the older turf field; as well as in areas of high traffic such as the sidelines. These results indicate that infill material can serve as a source for the spread of pathogens among athletes and that these organisms accumulate over time posing a greater risk if proper cleaning is not routinely performed.

Using GIS to Document Sand Dune Movement and Change in the San Rafael Desert, Southern Utah

Abstract Author: Tabitha Berghout
Abstract Mentor: Richard Ford

Poster Display 20 (Session 2)
Geoscience
Nye Undergraduate Research Scholarship

The San Rafael Desert exhibits an aeolian environment with several dune fields. The fields were monitored over time using aerial photography and satellite imagery collected in 1938, 1955, the mid 90s, 2006, 2009, and 2011. Earlier imagery lacked coordinates making it necessary to Georeference the images in ArcGIS. Changes in field movement, vegetation cover, the number of dunes in each field, and types of dunes were observed. Imagery from 1938 generally show less dune activity and more vegetation cover. The following imagery taken in 1955 shows less vegetation and more dune activity. Several areas appear to have evolved from flat areas into dune fields with dune structures. It is worth noting that differences in resolution of the air photos may be the source of differences seen in vegetation. Additionally some discrepancies were noted in some dune fields, including the field designated 3-3 where a dune field has lost all form. Dune fields also exhibit migration towards the Northeast which was confirmed in field observations tracking the movement of a single dune on two separate occasions. Climate data was used to compare changes.

Comparative molecular genetics of the unusual chromosome telomeres of *Drosophila*

Abstract Author: Haylie Cox
Abstract Mentor: Jonathan Clark

Poster Display 21 (Session 2)
Zoology
Gardner Undergraduate Research Scholarship

In most eukaryotes, telomeres are formed by a short nucleotide sequence that is repeated many times at the chromosome end. In contrast, the chromosome ends of *Drosophila* consist of at least two different transposable elements, HeT-A and TART, which are tandemly arrayed in multiple copies. In *D. melanogaster*, these transposable elements are confined to the ends of chromosomes and are not found at any other sites in the genome. This is the most striking example of a eukaryotic transposable element that performs an essential cellular function. A molecular study has been initiated that examines the phylogeny of the HeT-A transposable element among eight species within the melanogaster species subgroup, which includes *D. melanogaster*. Multiple HeT-A sequences were obtained from each species and these sequences are compared to an expanded dataset of HeT-A sequences available from the *Drosophila* genome projects. The phylogeny of the HeT-A sequences is compared to the phylogeny of the host species, determined by ADH gene sequences. For some comparisons, the extent of HeT-A nucleotide divergence exceeds 50%. The phylogeny reveals that multiple sequences from each species are not always monophyletic. This suggests that multiple subfamilies, each with their own evolutionary history, exist in all genomes examined. Alternative explanations, including lateral transfer of HeT-A elements between species, are discussed. Additional comparisons of the rate of synonymous and nonsynonymous nucleotide substitutions suggest that there is no selection operating on the HeT-A coding region, surprising finding given the importance of telomeres for cellular stability.

Effect of Glyphosate and Roundup on the brineshrimp *Artemia* survival and physiological responses

Abstract Author: Jessica deJong
Abstract Mentor: Nicole Berthelemy

Poster Display 22 (Session 2)
Zoology

Introduction: The herbicide Roundup and its active ingredient, Glyphosate, are widely used for weed control. These chemicals end up into streams and lakes, including the Great Salt Lake. Originally advertised as being non-toxic and environmentally friendly, glyphosate and its inactive ingredients, among them polyethoxethyleneamine (POEA), have carcinogenic effect and interfere with growth and hormonal regulation in many animal species. The goals of this project are a) to determine the survival rate of *Artemia* larvae exposed to various concentrations of Glyphosate and two types of commercially sold Roundup (50% concentrate-Roundup and ready-Roundup) and b) quantify the stress response of adult shrimp exposed to these chemicals.

Materials and Methods: *Artemia* larvae and adults were exposed to various concentrations of the above chemicals. The survival rate, growth fertility are calculated. The up-regulation of stress protein hsp70 and 90 will be measured using PAGE electrophoresis and western blot.

Results: Glyphosate at 0.5g/L killed all larvae within 1 hour. However, larvae survived all other concentrations for at least 72 h. A 48h exposure killed 21% and 25% larvae placed in 1g/L concentrate-Roundup and 0.01g/L ready-Roundup, respectively, thus making ready-Roundup the most toxic. Other parameters are currently being measured.

Patterns of Synorogenic Sedimentation and Unroofing History of the Willard-Paris-Meade Thrust Sheet, Sevier Fold-Thrust Belt

Abstract Author: Amanda Gentry
Abstract Mentor: Adolph Yonkee

Poster Display 23 (Session 2)
Geosciences

The Willard-Paris-Meade thrust sheet and associated synorogenic deposits are well exposed from SE Idaho and northern Utah to western Wyoming. This thrust sheet comprises a 10- to 15-km-thick package of miogeoclinal rocks that was emplaced ~60 km eastward within the Sevier fold-thrust belt. The thrust sheet included Jurassic-Triassic strata (now mostly eroded), mixed siliciclastic-carbonate upper Paleozoic strata, carbonate-rich lower Paleozoic strata, and quartzite-rich basal Cambrian to Neoproterozoic strata, which each display distinctive detrital zircon (DZ) signatures. The thrust system had a long deformation history recorded by westward thickening and coarsening synorogenic strata, including the Aptian()Albian Gannett Group, Bear River and Aspen formations, and Turonian Frontier Formation. To better understand unroofing history and nature of flexural loading, an integrated thermochronologic and DZ/petrographic study of source bedrock and synorogenic strata is underway. Zircon U-Pb geochronology of 10 samples of synorogenic strata collected from two transects reveals consistent stratigraphically upward changes in DZ patterns. DZ spectra for the Gannett Group show abundant Jurassic and Triassic grains, moderate amounts of Paleozoic, Neoproterozoic, and Mesoproterozoic grains, and lesser Paleoproterozoic grains, consistent with erosion of Mesozoic to upper Paleozoic bedrock in the thrust sheet. Limited volcanic grains in the upper part of the group indicate a maximum depositional age <110 Ma. DZ spectra for the Bear River and Aspen formations have fewer Jurassic and Triassic grains and a complex mix of Paleozoic to Archean grains, consistent with erosion of mostly Paleozoic bedrock. DZ spectra for

the Frontier Formation reveal increasing amounts of Mesoproterozoic and Paleoproterozoic grains, consistent with increased erosion of basal Cambrian to Neoproterozoic quartzites. The Aspen and Frontier formations contains tuffaceous layers and sandstones with abundant ~103 to 95 Ma volcanic grains that closely constrain depositional age. Total thickness of the synorogenic strata increase from ~1000 to >3000 m westward. These observations indicate protracted emplacement and loading by a dominant thrust sheet that was unroofed during the Early Cretaceous.

A Complex Protein Diet can Improve Rehabilitation Following Intestinal Atrophy

Abstract Author: Stephanie Hansen
Abstract Mentor: Brian Chung

Poster Display 24 (Session 2)
Zoology
Eccles Undergraduate Research Scholarship

Re-feeding syndrome is the result of the rapid re-introduction of nutrients following a period of severe malnourishment or starvation. During this time the intestinal tract attempts to conserve energy by undergoing atrophy and nutrient reintroduction can overwhelm diminished intestinal absorptive ability, leading to critical complications. We hypothesized that a complex protein diet would improve rehabilitation over an elemental amino acid-only diet. We utilized the nematode *Caenorhabditis elegans* as a minimalist model of refeeding. To mimic refeeding, we induced a developmental state, dauer, by starvation and then transferred animals into either a complex or elemental diet, measuring body length daily for 5 days. Data were statistically analyzed using ANOVA and expressed as mean+/-SEM. Results indicate that the complex animals demonstrated at least 10% ($p < 0.05$) improved growth and reached adulthood 1 day sooner compared to elemental animals. To determine intestinal proteolysis, worms were fed green fluorescent protein and fluorescence along the intestinal tract was measured. Our findings demonstrate a decreased rate ($p < 0.05$) of intestinal proteolysis among exclusively complex diet worms. Our data confirm our hypothesis that a complex diet improves growth and rehabilitation over an elemental diet. Extrapolating these results might help to improve rehabilitation of refeeding syndrome through dietary manipulation.

Costs Associated with Colonial Nesting in American Avocets (*Recurvirostra Americana*)

Abstract Author: Katy Heitkamp
Abstract Mentor: John Cavitt

Poster Display 25 (Session 2)
Zoology

Why do some birds nest in tightly packed colonies? Colonial nesting is an aspect of avian breeding biology and occurs in some shorebirds including the American Avocet (*Recurvirostra americana*). There are costs and benefits associated with colonial nesting in avian species. Benefits may include, greater safety from predators and providing the opportunity for inexperienced members to observe and learn foraging and breeding behavior from experienced members. Costs may consist of, increased rates of disease and parasites, increased competition for resources, and abnormal nesting behavior. Ecological and social factors in colonial nesting have implications on hatchability and overall nest fate. We investigated the evolution of coloniality in American Avocets using nest card data collected, focusing on a five-year period between 2004 and 2009. Data was examined to determine the general characteristics of 38 artificial islands at Bear River Refuge, in Box Elder County, Utah. The islands were built to provide waterfowl nesting habitat. Characteristics identified included date of first egg, clutch size, and maximum number of eggs for each island. Three islands were recognized as one colony. We are interested in looking at what the selective advantage of colonial nesting is among this species. One possibility is that it may be an evolutionary adaptation to avoid nest and egg depredation by mammal predators.

Fungal Endopyte Frequency of *Populus Fremontii*

Abstract Author: Julia Hull
Abstract Mentor: Ron Deckert

Poster Display 26 (Session 2)
Botany

Fungal endophytes are fungi that spend all or most of their life cycle within aerial portions of a plant without causing visible signs of disease. Although much is not understood, endophytes play an important role in the ecology of the host plant, making the host more resistant, in some cases, to pathogens and herbivores, and may increase the ability to recover from stress. Likewise, distributions of endophytes are variable within the host plant tissue. This study examined the relationship between age of tissue in *Populus fremontii* and the frequency of endophyte infection. As host plant tissue increases in age, proportions of endophyte infection also increased, with a 100% proportion by five years. The relationship between age and infection frequency is important for long life-cycled woody plants to keep evolutionary pace with short life-cycled pathogens and herbivores.

Characterization of Salt Tolerance of Halophilic Bacteria isolated from the Great Salt Lake

Abstract Author: Sean Hunt
Abstract Mentor: Michele Culumber

Poster Display 27 (Session 2)
Microbiology
Gardner Undergraduate Research Scholarship

By definition, halophiles are aerobic and require at least some Sodium Chloride for growth. Typically marine organisms grow best with 1-4% Sodium Chloride, whereas halophiles require 3-12% NaCl, and extreme halophiles require 15-30% Sodium Chloride. Many halophiles are so fragile that, when placed in distilled water, they may immediately lyse due to changes in osmotic conditions. The Great Salt Lake, with its high salinity ranges from 5 to 27% Sodium Chloride (50 to 270 parts per thousand), and is home to many halophiles. This research is compiled of several of those genera, (*Idiomarina* (3), *Halomonas* (26), *Salinivibrio* (39), and *Marinobacter* (51).) which have been isolated and identified based on 16s rRNA gene sequencing. Varying Sodium Chloride composition and other key component growth requirements the growth curves of all the previously mentioned halophiles have been determined and graphed. This research provides vital information concerning the growth parameters of these bacterial halophiles. Future research can thereby be established on this information. Such research may involve; where in the Great Salt Lake different halophiles may be found, how different ecological and changes in solute composition of the Great Salt Lake may effect micro life, it may even help give support to hypothesized micro physiological properties of the studied halophiles.

Isolation and Characterization of Novel Bacteriophage from the Great Salt Lake that Infect *Halomonas*

Abstract Author: Lauren Johnson
Abstract Mentor: Craig Oberg

Poster Display 28 (Session 2)
Microbiology
Nye Undergraduate Research Scholarship

Bacteriophages in aquatic environments play a significant role in bacteria population control, as well as recycling nutrients. The bacterial genus *Halomonas* is commonly found in the Great Salt Lake (GSL), but very little is known concerning its population dynamics. This euryhalophilic genus is highly versatile concerning its ability to grow in a wide range of substrates and environmental conditions including salt concentration. To better understand GSL microbial ecology, seven strains of *Halomonas* were isolated from the GSL and identified using 16S rRNA. Samples of South Arm GSL water were filtered twice through a 0.2 μ m filter, and tested against these *Halomonas* strains using soft agar overlays to detect *Halomonas* phages. Four strains exhibited plaque formation indicating the presence of phages. *Halomonas* phage isolates produced very small plaques, sometimes barely visible. Individual phages were isolated by vortexing agar plugs taken from single plaques in sterile saline then filtering the solution through a 0.2 μ m filter. From host range streak plates, a single phage isolate (LJ17) appears to infect 4 closely related *Halomonas* strains. Electron micrographs of LJ17 phage indicate it has a small icosahedral head and perhaps a very short tail. There also appears to be a satellite phage that may be associated with LJ17. There are no reports of *Halomonas* phages isolated from the Great Salt Lake (GSL), although there are phages found for marine *Halomonas* strains. Successful isolation and characterization of novel GSL *Halomonas* phages, besides being critical for development of host/phage models, will also allow studies of GSL microbial ecology.

The Sedimentology and Petrology of the Moroni Formation; Indianola, Utah

Abstract Author: Julianne Lemmon
Abstract Mentor: Jeffery Eaton

Poster Display 29 (Session 2)
Geoscience
Nye Undergraduate Research Scholarship

The Moroni Formation covers a large area of central Utah, and only parts of it having been studied. This study was undertaken northeast of Indianola, Utah, in Little Clear Creek Canyon. This formation is a complex geological unit made up of coarse volcanoclastic sandstones and conglomerates, a thick air fall tuff, lava flows, and intrusive igneous bodies. This unit represents an unusual period in the regional geologic history when western North America underwent a long period of volcanic activity accompanied by relatively quiescent tectonics. The section in the study area records several pyroclastic eruptions and flows emitted from an unknown volcanic center. The petrology of these rocks indicates the sequence is dominated by pyroxene and amphibole bearing andesites. Between these eruptive pulses, fluvial reworking and deposition generated a thick (450 m) sequence of volcanoclastics. A single fossil was previously discovered at the top the formation which dates the uppermost part as early or middle Miocene. Attempts to locate additional fossils as part of this study were unsuccessful. There are several competing theories on the origin of these volcanics and the results of the chemical analyses (not yet available) will aid in identifying the actual volcanic center. The topography in the Miocene was similar to that of today, in that the region was mountainous with large valley drainage systems. The volcanic flows, ashfalls, and volcanoclastics infilled these valleys. The sequence found in Little Clear Creek Canyon records primarily fluvial infill of one of these valleys. The basal tuff unit in the Moroni Formation within the study area represents an ash fall that would have originally blanketed a larger area, but only parts of it have been preserved as valley fill. Higher in section are several very poorly

sorted lahars that have had minor fluvial reworking. The thick uppermost layers consist of poorly sorted very lithic rich sandstones with thin conglomerate lens scattered throughout. This suggests that the eruptions had ceased and that reworking of the lahar and ash layers became the prominent process generating high energy, fluvially deposited coarse grained volcanoclastics.

Calibration and Modification of Off-The-Shelf Gas Sensors for Monitoring Earths Atmospheric Chemistry.

Abstract Author: Byron Millet
Abstract Mentor: John Sohl

Poster Display 30 (Session 2)
Physics

Concentrations of O₃, CO₂, CO, and NO_x are being measured from ground-level to the mid-stratosphere. These gases directly affect both climate change and ground-level pollution ('inversions'). Stratospheric ozone protects life from high levels of ultraviolet light. NO_x plays an important role in stratospheric photochemistry as a primary mechanism for ozone removal. CO and CO₂ both play important roles in their contributions to global warming while CO concentrations can also provide insight into the dynamics of other aspects of Earth's atmospheric chemical system. Gas sensors designed for sea-level applications are being modified and calibrated for a wide range of pressures using a custom-made environmental test chamber. Interference from other species expected to be encountered is being evaluated for each sensor. Limits of detection and limits of quantization are also being determined. These sensors fly on Weber State University's HARBOR (High Altitude Reconnaissance Balloon for Outreach and Research) program's high-altitude research balloons typically reaching altitudes of 30km to 34km. Preliminary CO₂ data from five flights in 2012 are consistent with previous studies but need the calibration curves developed by this project to be useful. The modifications adapting these sensors for use in the harsh, edge-of-space, environment will also be described.

Isomorphic Tests Using Invariants and Adjacency Matrix Reordering

Abstract Author: Eric McKinney
Abstract Mentor: Mahmud Akelbek

Oral Presentation (Session 2)
Mathematics
Nye Undergraduate Research Scholarship

We consider a list of properties of isomorphic simple graphs and the use of these properties as quick tests to show nonisomorphic relationships. We compare advantages of tests, and list these in order of efficiency. We consider a nonisomorphic test using cospectral graphs with its drawbacks. And lastly, we consider an algorithmic approach showing two graphs are isomorphic through efficient adjacency matrix reordering techniques.

Survey for Helenalin Among Utah Asteraceae Species

Abstract Author: Taylor Nelson
Abstract Mentor: Sue Harley

Oral Presentation (Session 1)

Botany

Denkers Undergraduate Research Scholarship

Arnica is a common form of complementary medicine used to treat bruises and sore muscles. Arnica salves contain extracts of flowers of *Arnica montana*, a member of the Asteraceae. Due to arnica's popularity, *A. montana* is becoming scarce in Europe (its native range) and is sometimes substituted commercially with *A. chamissonis*. This study focused on finding other sources of helenalin, a sesquiterpene lactone presumed to be the active component, among species in the Asteraceae. *A. chamissonis*, *A. cordifolia*, *A. latifolia*, *A. longifolia*, *A. mollis* and *Helianthella uniflora* were collected from Alta, UT, and *Helenium autumnale* from Salt Lake City, UT. Sesquiterpenes were extracted from the flowers and separated by thin-layer chromatography. Helenalin and possible helenalin derivatives were identified by their reaction with vanillin and comparison to a pure helenalin standard. Flowers from six of the seven species contained helenalin, with *Helenium autumnale* containing the highest concentration and *Helianthella uniflora* containing none. Therefore, six of the species tested in this study have the potential to be used commercially to prepare arnica salves and thus allow the *A. montana* population to re-establish itself.

Novel Survey of Normal Skin Biota its Interaction with Chytrid Fungus in Frogs and Toads

Abstract Author: Scott Nagao
Abstract Mentor: Jason Fritzler

Poster Display 31 (Session 2)

Microbiology

Gardner Undergraduate Research Scholarship

Batrachochytrium dendrobatidis belongs to the fungal phylum Chytridiomycota, and in 1999, was both identified as a new species and associated with causing chytridiomycosis in amphibians. This fungus has been implicated in rapid population declines in multiple amphibian species in North and Central America, Europe, and Australia. There is data indicating that bacteria living on the epidermis of amphibians produce chemicals that inhibit the growth of *B. dendrobatidis*. However, this previous data is associated only with salamanders. There is no similar inhibitory data published for frog and toad species, and no data published on the identification of normal skin biota of frogs and toads. We have isolated over 175 bacterial isolates from 67 toads and frogs, extracted DNA, and used PCR to amplify the 16S ribosomal DNA gene. Amplicons have been sequenced to determine speciation based on genetics. This is the first report of normal bacterial skin biota in frogs. Further, a skin swab was also taken from these frogs and used to analyze which are infected with *B. dendrobatidis* via PCR screening. While the prevalence of fungal infection appears to be low, we have been able to correlate fungal-positive hosts with number and/or species of normal bacterial skin biota.

Gas Chromatography Analysis of Fatty Acid Methyl Esters from *Chlorella Vulgaris* Algae

Abstract Author: Justin Nybo
Abstract Mentor: Timothy Herzog

Poster Display 32 (Session 2)

Chemistry

Eccles Undergraduate Research Scholarship

Finding a source of energy to supply the demands of energy consumption globally is one of the biggest problems facing society today. Algae represent an abundant source of biomass that could be used as a source to make biodiesel.

In my research, we set up an array involving 40 flasks that were split into 8 rows and 5 columns. Each row had a unique frequency of light that came from a combination of red, green or blue LEDs. Each column varied the light intensity by changing the distance of the flask from the light source. The goal of my research was to quantify the amount of lipids produced by the algae under different lighting conditions. This was accomplished by converting the lipids produced by the algae into fatty acid methyl esters (FAMES) and then analyzing the FAMES using a gas chromatograph (GC). We used a direct FAME synthesis outlined by O'Fallon et al in their research. As soon as the lipids were converted into FAMES we identified and quantified the FAMES. Careful comparisons of the samples analyzed in the lab with purified standards helped to identify the type and amount of lipids produced by the algae.

Vibrio Metschnikovii Associated with Brine Shrimp Eggs Isolated from the Great Salt Lake in Utah

Abstract Author: Seth Peterson
Abstract Mentor: Karen Nakaoka

Poster Display 33 (Session 2)

Zoology

Vibrio metschnikovii, a halotolerant gram negative bacterium, was isolated from washed brine shrimp eggs collected from the Great Salt Lake (GSL). This organism grew as yellow colonies on TCBS, a media selective for *Vibrio* species. Extraction of total RNA with PCR augmentation of the 16S rRNA gene, BLAST/RDP analysis and phylogenetic analysis revealed a 99% match of our isolate to *Vibrio metschnikovii* while there was only 91% match to *Salinivibrio*. To the best of our knowledge neither *V. metschnikovii*, nor any other *Vibrio* species, has been isolated from the GSL. Although there were earlier reports of *Vibrio* species in the GSL, these have been reclassified as *Salinivibrio*. However, this is consistent with others who have documented *Vibrio* species to be associated with brine shrimp eggs, larvae and adults from hypersaline settings in the San Francisco bay, in Israel and processed eggs. Although *V. metschnikovii* is a low level pathogen to humans, it has been shown to have devastating effects in aquaculture. Further studies are in progress to determine the role, if any, of *V. metschnikovii* and other *Vibrio* species in the ecology of GSL brine shrimp as they are a worldwide nutrient source in aquaculture.

Maternal Selection vs. Paternal Competition: Embryo Development in *Sophora Japonica*

Abstract Author: Jackie Parker
Abstract Mentor: Ron Deckert

Oral Presentation (Session 1)
Botany

Plants may selectively abort seeds as a result of limited resources, self-pollination, or a lethal paternal gene combination. The purpose of this study was to understand how this interaction works in a small community of *S. japonica*. It was expected that the greatest seed success would occur in the outer crown and stylar end of the fruit. This was assumed because these are the regions with the highest probability of out-crossing and is consistent with the habit of most other legumes. Four trees growing along a North-South line were chosen and the seed presence and position were recorded. A presence/absence chi squared test was done between the placement and number of mature and aborted embryos according to the position of pods on each tree. It was observed that ovule position played strong role in seed success. A region of non-fertilization near the peduncle occurred on all samples and the stylar seeds had the highest amount of maturation. The data suggest that a preference for offspring produced by out-crossing exists in small communities *S. japonica*.

Engineering, Design and Construction of a High-Vacuum Research Facility

Abstract Author: M. Clay Rumsey
Abstract Mentor: John Sohl

Poster Display 34 (Session 2)
Physics

Vacuum Technology is used in a wide variety of applications from industrial manufacturing processes such as thin film processes, freeze drying, and electronics manufacture to simulating different atmospheric conditions for processes such as high-altitude, near-space flights. A vacuum system was designed that is computer controllable but with full manual-over-ride features. The system is designed to work over a wide-range of vacuum pressures from high-vacuum to atmosphere with multiple over-lapping gauge systems to monitor the full range. The system has been designed to be reasonably portable with a large easy-to-access chamber with enough access ports to be adaptable to almost any future student research project from manufacturing solar cells to measuring the optical properties of gases. Using surplus, purchased, and handmade components the system was constructed for approximately one-tenth the price of a comparable commercial system. This facility has already been extensively used for flight simulations to the edge-of-space for Weber State University's HARBOR (High Altitude Reconnaissance Balloon for Outreach and Research) program.

Internalization and Survival of Salmonella in Tomatoes

Abstract Author: Kristi Russell
Abstract Mentor: Karen Nakaoka

Poster Display 35 (Session 2)
Microbiology

Salmonella species cause many cases of food borne illness annually in the USA. Since ingestion of contaminated raw produce is a risk factor, the FDA has suggested interventions such as washing produce before consumption. However, recent studies have shown pathogens may be internalized into some produce, reducing the effectiveness of washing. For these reasons, this study was undertaken. Initially, an experimental model was developed to determine whether internalization of *Salmonella enteritidis* occurred after its inoculation onto the stem scar of tomatoes. Internalization was determined by plate counts of *Salmonella* on the skin and in the top and bottom of the skinless pulp. Results indicated that *Salmonella* was able to penetrate the stem scar, with infectious levels in the top, skinless pulp of all tomatoes for seven days after inoculation. During this time, about 10-fold multiplication occurred in the skinless top pulp and on the skin, while about 1000-fold fewer *Salmonella* were found in the skinless bottom pulp. Uninoculated control tomatoes contained no internalized *Salmonella*. Further studies are underway to determine if *Salmonella* can penetrate regions of the skin other than the stem scar. This study suggests that use of untreated irrigation water containing *Salmonella* could contaminate produce internally.

Plant Secondary Metabolites as Inhibitors of Drug Resistant Bacteria Causing Wound Infections in U.S. Military Personnel

Abstract Author: Alisha Ryan
Abstract Mentor: Jason Fritzler

Poster Display 36 (Session 2)
Microbiology

One of the major challenges facing U.S. military caregivers is the presence of multidrug resistant organisms in extremity wounds. The most frequently identified drug resistant strains of bacteria found in these wounds are *Acinetobacter baumannii*, *Pseudomonas aeruginosa*, *Escherichia coli*, *Klebsiella pneumoniae*, and *Staphylococcus aureus*. Due to these organisms rapid increase in resistance to the commonly used drugs, it is crucial to discover and establish alternative methods for treating these microbial infections. We have screened 31 individual compounds from 10 major compound families to determine if plant-based phytochemicals could be explored further for use in treating bacterial infections in patients with military wounds. All compounds were tested to determine the minimum inhibitory concentration (MIC) and minimum lethal concentration (MLC). Of the 31 compounds tested, 21 (67.7%) inhibited at least one strain used in this study, with only 1 of the 21 (4.8%) inhibiting all strains. There were 10 (47.6%) of the compounds that displayed MIC values less than 100 µg/ml. For compounds displaying MLCs, they ranged from 5 mg/ml to 625 µg/ml. While there is much more research that needs to be done with each of these compounds, this work is a crucial first step in the drug discovery process.

Isolation of Enteric Bacteria from Fresh Water Aquariums

Abstract Author: Dexter Snyder
Abstract Mentor: Mohammad Sondossi

Poster Display 37 (Session 2)
Microbiology

Fresh water aquariums are common in many homes. There have been published reports suggesting the presence of Salmonella species in aquariums. The possibility of Salmonella species being present in aquariums would be a concern in residential settings with young children present and could be considered problematic for individuals or groups with higher risk of infections. In the present study, efforts were made to test for the presence of enteric bacteria, specifically Salmonella, in residential and commercial fresh water aquariums. The isolated bacteria were subject to routine microbiological and biochemical tests to characterize their taxonomic affiliations. Based on initial tests, bacterial isolates were obtained that appeared to be Salmonella species. These presumptive conclusions were based on biochemical tests, growth on selective and differential media normally used to identify this group of bacteria, as well as antiserum testing. Four of the isolates that tested positive in all tests were identified based on 16S rRNA sequencing and found to be Citrobacter youngae. It is concluded that, more specific biochemical tests and or molecular approaches should be performed to confirm the presence of bacteria such as Salmonella species in environments such as aquariums.

Native Ground Covers To Manage Invasive Weed Growth During River Restorations

Abstract Author: Ronnamay Walker
Abstract Mentor: Barbara Wachachi

Poster Display 38 (Session 2)
Botany
Denekers Undergraduate Research Scholarship

Due to increased awareness of water conservation, river restorations are becoming standard procedure in this country. Accompanying these projects is a standardized set of goals and guidelines for restoration; one of these basic goals states that during the construction phase, 'No lasting harm should be inflicted on the ecosystem' and the loss of native vegetation should be minimized during in-river reconstruction activity. 'Indeed, removal of any native riparian vegetation should be avoided unless absolutely necessary.' (Palmer, et al. 2005) Achieving these goals can be difficult, resulting in a greater loss of native river bank vegetation than desired. Most projects remedy this with a more extensive native replanting at the end of the project. However, this period of time, while the riparian corridor is left barren, can become critical, as it provides an inviting environment for invasive weeds. Once there, they become increasingly difficult to get rid of. The primary objective of this study was to find suitable native plants to provide a cover crop for riparian areas during the time of construction. These plants would serve as a physical control aimed at minimizing the expansion of invasive weeds. In order to accomplish this task, suitable plants would need to provide adequate cover by growing quickly and densely. In addition plants would need to meet the following criteria; to withstand some degree of human disturbance, be attractive, low maintenance, and lastly, be a complimentary step plant to the future native community. Sixteen different native plants with ground cover habits were selected, by grower availability, and planted at three locations along the Ogden River. Observation data was recorded in a field log book and a photographic history was also taken from June 6, 2012 to November 8, 2012. Of these sixteen plants, eight met the desired criteria.

Facies and Provenance Changes in the Cap-Carbonate Interval (CA. 685-665 MA) of the Neoproterozoic Pocatello Formation, Scout Mountain Area, Southeast Idaho

Abstract Author: Sara Yearsley
Abstract Mentor: Adolph Yonkee

Poster Display 39 (Session 2)
Geoscience

A newly analyzed diamictite-cap carbonate interval in the Neoproterozoic Pocatello Formation exposed on Scout Mountain, Idaho, records ca. 685-665 Ma syn- to post-glacial deposition and exhibits changes in facies and provenance as compared to correlative units northward. The massive diamictite lithofacies consists of poorly sorted quartzitic and granitic clasts up to 20 cm embedded in a sandy matrix. The diamictite is overlain by a distinctive 12.3 m-thick, upward fining, stratified unit of moderately sorted quartz arenite and laminated green argillite. The contact with the overlying cap carbonate is gradational and marked by cm-scale interlayered green siltite and dolostone, with the siltstone beds becoming thinner and less abundant upwards. The cap-carbonate unit (> 2.0 m thick) comprises thinly laminated, pink to tan dolostone with thin silty interbeds. Above the exposed cap carbonate unit is a covered interval (27 m) overlain by >7.5 m of m-scale, fine-grained feldspathic sandstone?argillite fining upward cycles with rare dolomite interbeds. The sandstone exhibits asymmetric ripples and soft sediment deformation. U-Pb geochronology of detrital zircons from the quartz arenite reveal three main peaks: ca 685 Ma grains related to syn-rift volcanic activity that constrain maximum depositional age (n=13 out of 100 grains), Mesoproterozoic grains (1.0 to 1.4 Ga) that may be recycled from older Neoproterozoic strata, and 2.45-2.7 Ga grains sourced from basement rocks and/or reworked from diamictite. The wide variety of detrital-zircon grain ages and sources is interpreted to record rapid influx of siliciclastic sediment during deglaciation, which slightly preceded to overlapped with rapid deposition of the dolostone. Dolostone $\delta^{13}C$ values range from -4.0 to -4.9 per mil PDB, similar to

other cap carbonate units locally and globally. The facies present at this locale show similarities as well as differences with other cap carbonate exposures in SE Idaho, particularly the sub-cap quartzite-argillite interval that is not present 20 km to the north at the other main exposures of this interval (Portneuf Gap). Varying thickness and facies changes are interpreted to reflect a dynamic depositional environment and rapid influx of sediment from multiple sources during glacial retreat.

Undergraduate Research

Flow Rate and Filter Efficacy Analysis for Measurement and Collection of Stratospheric Aerosols.

Abstract Author: Shane York
Abstract Mentor: John E. Sohl

Poster Display 40 (Session 2)
Physics

HARBOR is a high-altitude research program at Weber State University utilizing stratospheric weather balloons. We are counting the number of dust particles in the atmosphere relative to both aerosol size and altitude. We have discovered persistent spikes in aerosol counts at particular altitudes, especially at approximately 11km above sea-level. We want to determine what the particulates are, their impact on climate change, and their origin. We designed a device to collect samples of these particulates for laboratory analysis. As commercial air sampling systems are designed for use at near sea-level pressures, we are designing a custom-made system to operate in the low pressure, low temperature conditions found in Earth's stratosphere. A high sensitivity air flow sensor and microcontroller attached to the sample return apparatus will allow us to adapt the pumping rate to the changing conditions. A SEM will be used to study the filters and determine the elemental constituents of the captured particulates.

Further tests will be conducted in a high-altitude simulation chamber to measure and characterize the change of flow rate we will be experiencing in the near vacuum found at the edge-of-space. We expect this sample return mission to fly during the 2013 summer flight season.

College of Social and Behavioral Science

The Nature and Acquisition of Psychological Literacy by Psychology Students

Abstract Author: Logan Allen
Abstract Mentor: Eric Amsel

*Poster Display 27 (Session 1)
Psychology*

Psychology educators have argued that psychological literacy should be an outcome goal of undergraduate education in psychology because it is an important characteristic of citizens in a democratic society. To assess whether taking psychology courses promotes psychological literacy, high school and college psychology students completed three distinct questionnaires assessing their psychological knowledge, values, and skills. Scores on the three questionnaires were positively correlated with each other and formed a single dimension in a factor analysis which accounted for most of performance variance. Participants' scores on the single dimension, labeled as Psychological Literacy, was found to be related to completing courses in psychology even for High School students. Scores were also higher for psychology majors than psychology minors and for seniors than for freshmen. The results support the idea that psychology literacy is an integrated and adaptive set of psychological knowledge, attitudes, values, and skills that increases with exposure to and engagement in the discipline. Implications of the results for teaching and learning in the discipline will be discussed.

Stereotyped and Hostile Behaviors in Computer Mediated Communication: A Social Identity Approach

Abstract Author: Emily Brignone
Abstract Mentor: Joshua Marquit

*Poster Display 28 (Session 1)
Psychology*

It is well established in existing research that computer-mediated communication (CMC) is associated with hostile and stereotyped communication toward an out-group audience. Most research regarding these behaviors has drawn on classic deindividuation theory, which asserts that these behaviors are the product of disinhibition and occur as a result of loss of accountability and self-awareness. However, recent research has failed to find consistent evidence to support these processes. Recently, the Social Identity Model of Deindividuation Effects (SIDE) has been presented as an alternative explanation for the processes behind hostile and stereotyped behaviors in CMC. While previous studies have found consistent evidence for the cognitive component to SIDE, few studies have examined the strategic component of SIDE relating to social identity performance in the presence of an in-group or out-group audience. This study focused on the effects of identifiability and audience group normative attitudes on salient social identity and subsequent behaviors of CMC users. Specifically, stereotyped descriptions of out-group targets and expressions of hostility were greater when participants were identifiable to in-group audience, as opposed to being anonymous to an in-group audience. The results of this research project will significantly contribute to our understanding of hostile and stereotyped communication among online communicators.

Aeolian Sedimentation and Climatic implications of the Bruneau Dunes, Idaho

Abstract Author: Richard Bell
Abstract Mentor: Julie Rich

Oral Presentation (Session 1)
Geography
Denkers Undergraduate Research Scholarship

The Bruneau Dunes are based in a depression, about 5.6 kilometers in diameter, known as Eagle Cove in the Southwest region of Idaho. Eagle Cove is an old meander of the late Pleistocene and Holocene era (16,000- 10,000 BP) Snake River course. Because of the basin configuration, when winds carrying sediment travel into this region the sediments become trapped. The wind energy decreases while moving out of the basin and the entrained sediment load is deposited creating the tallest dune structure in North America standing at 143 meters.

Optically stimulated luminescence can establish when the sediments were last exposed to sunlight by detecting their subsequent response to environmental ionizing radiation exposure. As the sediments were transported, they trapped charges of radiation in their tiny crevices. With careful extraction and OSL measurements, the ratio of buried, sunlight deprived sediments, to sunlight exposed sediments will determine the estimated time of burial. By determining the burial date, I will estimate if the region was exposed to warmer, dryer condition (mobile dunes) compared to a wet environment (vegetated, stable dunes) during the Pleistocene and Holocene eras.

This study provides the first age estimates on the dune and will allow insight into climatic environmental change.

Auditory Processing and the Stress Response: How the Startle Response and Habituation May Be Predictors of PTSD

Abstract Author: Jennifer Bench
Abstract Mentor: Lauren Fowler

Oral Presentation (Session 1)
Psychology
Gardner Undergraduate Research Scholarship

Individuals who experience unexpected or startling noises undergo physiological changes due to the body's stress response system. This response system involves the activation of the hypothalamic-pituitary-adrenal (HPA) axis, the primary stress response system in the human body. In this situation, an individual will also experience a reflexive startle response. One of the predictors for PTSD is an inability to habituate to startling noises. Individuals who do not habituate after a repeated loud noise may have a predisposition for PTSD. The purpose of this study is to find whether a loud, unexpected noise produced in a stressful environment will cause physiological changes that will suggest a connection between auditory processing, the startle response, and the stress response. The participants will complete a social stress test during the course of the study, which is designed to induce a mild stress response. During this time, a moderately loud noise will be presented unexpectedly, and the participants' galvanic skin response, heart rate, and salivary cortisol levels will be measured, as these are physiological indicators of stress. Results will be analyzed to determine if stress affects the startle response induced by the noise. Results are expected to show that individuals who do not habituate well to loud noises in stressful situations may be at greater risk for developing traumatic stress disorders such as PTSD.

The Effects of Cortisol on Auditory Processing and Perception

Abstract Author: Daniel Feller
Abstract Mentor: Lauren Fowler

Oral Presentation (Session 1)
Psychology
Gardner Undergraduate Research Scholarship

Cortisol, a human glucocorticoid produced when one is stressed, has been shown to affect certain aspects of auditory processing. Though those with increased cortisol levels tend to show a generally attenuated auditory response, studies differ in demonstrating which specific aspects of auditory processing are affected. Even fewer studies have investigated the broader effect that such changes in processing might have on auditory perception. This study aims to clarify components of auditory processing that are affected by the cortisol stress response and to investigate the extent to which these changes affect auditory perception as a whole. In order to assess the role cortisol has on auditory processes, a within subjects design will be used. Participants will first be presented different auditory stimuli (i.e. deviating tones, pitches, frequencies, and durations) while auditory evoked potentials are recorded. After this pre-test, participants will be asked to undergo the Trier Social Stress Test, a procedure designed to place participants under a moderate degree of stress in order to elevate cortisol levels. Following the Trier Social Stress Test, participants will repeat the auditory stimuli procedure used at the beginning of the study. Cortisol assays will be taken at various intervals throughout the study in order to assess salivary cortisol levels in relation to auditory responses. Results, as measured by change in P1, N1, and P2 components of the vertex potential, are expected to show a marked difference in auditory processing between those with elevated salivary cortisol levels compared to a control group. It is also expected that several aspects of auditory processing (such as sensitivity to frequency change and tone duration change) will be affected while others (such as intensity change) remain unaffected. Such results

may prove important in understanding the effects that daily stress has on the way music is processed and perceived.

Creating a Sense of Home: Examining the Personal Belonging of World War II Servicemen

Abstract Author: Paul Greenhalgh
Abstract Mentor: Kathryn MacKay

Oral Presentation (Session 1)
History
Gardner Undergraduate Research Scholarship

Much has been written about the experiences of those who served in World War II. Far less, however, has been written about cultural aspects of those experiences. My research focused on the personal effects that servicemen carried with them during the war and how those possessions helped them create a sense of home while they were deployed. Servicemen had a vast array of possessions with them that were not Government Issue. These included diaries, pictures of, and letters from loved ones, Bibles, pets, musical instruments, and talismans. Moreover, in letters and diaries, many servicemen described why it was important for them to carry this “extra weight” into combat. My research included a review of the scholarship on World War II veterans and a review of the psychological literature on the comfort provided by pets and talismans. I also worked with oral histories, diaries, letters, and photographs at the Library of Congress and the Institute on WWII and the Human Experience at Florida State University. I discovered that many servicemen created a sense of well-being by keeping close to them objects which reminded them of home. By focusing on these objects, I have realized that part of the war experience includes maintaining a sense of identity and cultural connections.

Nations United: Perspectives on the Fall of the League of Nations and the Rise of the United Nations

Abstract Author: Matthew Glover
Abstract Mentor: Nancy Haanstad

Poster Display 29 (Session 1)
Political Science

This project will demonstrate the flaws and downfall of the League of Nations, some Major diplomatic events between the First and Second World Wars, and the establishment of United Nations from the Realist and Liberal perspectives. These two models were chosen due to the contrasting natures that are inherent in each school of thought. After offering comparative examinations, I will make the claim that the United Nations today is an uncomfortable union between these two perspectives.

The National Alliance on Mental Illness's Peer-to-Peer Class and its Effects on Mental Health Literacy

Abstract Author: Ariel Hargrave
Abstract Mentor: Melinda Russell-Stamp

Poster Display 30 (Session 1)
Psychology

A review of the literature surrounding mental health literacy has suggested that there are many misconceptions about those living with mental illness. These misconceptions effect help-seeking, treatment, mental health policies, early intervention and social support. The National Alliance on Mental Illness (NAMI) offers a peer-to-peer taught class called Building Recovery of Individual Dreams and Goals through Education and Support (BRIDGES). This class addresses these misconceptions and aims to educate those struggling with mental illness on how to self-advocate. The objective of this study is to measure the effectiveness of this class by conducting a pre and post assessment at the beginning of the class before material is presented and at the end of the class. A population of approximately 100 participants over the age of 18 diagnosed with a mental illness will be used. The assessment includes eleven total questions that identify key factors to recovery and mental health literacy. A five point likert scale will be used to measure participant's responses. Data will be collected starting in January of 2013 and will be completed in March of 2013. Data will then be analyzed using a T-test in SPSS.

Understanding the Relationships Between Sleep Cycles and Autistic Symptomology

Abstract Author: Trevor Hicks-Collins
Abstract Mentor: Lauren Fowler

Poster Display 31 (Session 1)
Psychology
Gerdner Undergraduate Research Scholarship

With autism spectrum disorders (ASD's) on the rise (1 in 88 children were diagnosed with ASD in 2008), it is imperative that we examine factors related to this disorder. Numerous aspects of ASD life can affect the severity of the disorder (i.e. diet, environment), and sleep is one of them. Sleep problems in children with ASD's occur more frequently, and there is a higher incidence rate in ASD children compared to normal children. The sleep literature in non-ASD children is clear about how sleep deficits adversely affect behavior and cognition, but there is little research to indicate the effects of sleep deficits on ASD children. This study was designed to assess the effect of sleep quality and quantity on ASD symptoms. The participants were children, ages 5-8, who were rated on the autistic spectrum. The children's sleep was assessed using Actigraph monitors, which provided an objective measure of sleep quality and quantity. The children wore the monitors each night for one week. Also, parents and teachers kept daily records of the children's sleep quantity and autistic behaviors, reporting both good and bad behaviors. Results indicate that the amount and quality of REM sleep (both short-term and long-term) affects the frequency of autistic symptomology in children. Helping parents and teachers understand how important sleep is in affecting autistic symptomology can help modify behaviors. Studies like this are instrumental to providing us with information to better understand one of the fastest growing disorders affecting children today.

College Tennis Players: Pressure, Abuse, Support, and Involvement from Parents

Abstract Author: Annika Karlsen
Abstract Mentor: Joshua Marquit

Poster Display 32 (Session 1)
Child and Family Studies

This descriptive correlational research project looked at four factors that influence current elite college tennis players and gender differences of prevalence of these factors. The factors explored were pressure, abuse, support, and involvement of parents. A survey was distributed to 132 athletes and 31 athletes responded. Gender differences were looked at in regards to prevalence of parents involvement, reported levels of abuse from athletes, parental support, parental pressure, and the overall effect of tennis on the athlete/parent relationship. Positive correlations between verbal and emotional abuse and negative outcomes were discovered in this research. This research found that there were no gender differences in perceived parental pressure and no gender differences in verbal, emotional, and physical abuse reported from elite college tennis players. There was also a positive correlation between the parents being involved in on and off court coaching and the athlete reporting that tennis had helped their overall relationship with their parents. Finally, it was found that within this subject group, the majority of athletes reported that their relationship with both their mother and their father was helped by tennis.

The Secret Informant Deep Throat in American Popular Culture.

Abstract Author: Travis Padilla
Abstract Mentor: Kathryn MacKay

Oral Presentation (Session 2)
History
Eccles Undergraduate Research Scholarship

This study details how Deep Throat has been used as a reference and how he has resonated throughout American popular culture. The epic meetings between Washington Post reporter Bob Woodward and secret informant Deep Throat have resonated throughout American history and culture for nearly four decades. Woodward and his colleague at the Washington Post, Carl Bernstein, released their book *All the President's Men* in 1974, which described the meetings and subsequently inspired the imaginations of Americans. The book chronicled their journey of covering the Watergate Scandal for the Washington Post. Two years later the book was turned into a movie which depicted Deep Throat, the most famous secret informant in American history, as a paranoid, chain smoker who wore a trench coat. Over the next forty years, the Woodward and Deep Throat's meetings became a popular reference for writers, directors, and creators who incorporated government and corporate conspiracy and cover-ups into their television shows, films, and video games. Deep Throat became legendary in American popular culture.

Sustainable Transportation: An Analysis of Bicycle Infrastructure surrounding Weber State University

Abstract Author: Hannah Rice
Abstract Mentor: Dan Bedford

Oral Presentation (Session 2)
Geography

Today there are a number of universities working to promote sustainability initiatives as a way to improve their environmental credentials. In particular, transportation is one area where many universities can improve their environmental practices and image. Cycling is an active, environmentally friendly way of travel. However, the use of cycling as a mode of transportation is often underutilized due to many factors such as insufficient or unsafe cycling infrastructure, shortage of cycling amenities, and undesirable land use conditions, all of which work to inhibit a commuter from choosing cycling over the use of an automobile. This study examines bicycle commuting at Weber State University, a primarily undergraduate institution located in Ogden, Utah. A survey of road-surface conditions, signage, availability of cycling infrastructure, and quality of route content was conducted for all roads within a 1.5 mile radius surrounding the university, with the objective of producing a map of the most bicycle-friendly commuting routes to campus.

The Effects of Androgen Deprivation Therapy on Brain-Derived Neurotrophic Factor and TrkB Protein Expression

Abstract Author: Nicholas Smith
Abstract Mentor: Matthew Schmolesky

Poster Display 33 (Session 1)
Psychology
Eccles Undergraduate Research Scholarship

The purpose of this study was to investigate the molecular reason for why Androgen Deprivation Therapy (ADT) has the common side effects of developing obesity and type 2 diabetes mellitus. ADT is commonly used to treat metastatic prostate cancer by dramatically diminishing testosterone levels. We hypothesized that such a decrease in testosterone caused by ADT would decrease protein expression within the brain of Brain-Derived Neurotrophic Factor (BDNF) and/or the BDNF receptor protein known as TrkB. This would be significant because reduced BDNF and/or TrkB production has been demonstrated in the research literature as an etiology of both obesity and type 2 diabetes mellitus. In order to test the effect ADT has on BDNF and TrkB levels in the mammalian brain, eight adult mice were treated with an ADT drug (Lupron Depot), and the other eight were paired as a control. After 28 days, all mice were humanely sacrificed and brains were appropriately dissected and frozen for future work. We are in the process of sectioning the brains into thin coronal slices that will undergo immunohistochemistry for the detection of BDNF and TrkB protein expression.

Undergraduate Research

The Role of Historic 25th Street Farmers' Market in Ogden Food Desert Areas

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Oral Presentation (Session 2)
Geography

The Historic 25th Street Farmers' Market in Ogden Utah has been operating for 12 seasons. Ogden City has a large proportion of food desert areas within its city limits. This study examines who is utilizing this farmers' market. Do people who live in Ogden's food desert areas use the 25th Street Farmers' Market as a supplier of fresh food? Sixty-six customers at the farmers' market were surveyed to collect demographic information as well as information regarding the farmers' market, such as how often they visit the market. Twenty-one questions were asked in total. The results of the study show that majority of the customers are white, well educated, and female. Almost all are very likely to return to the market next season showing a great loyalty to the market. The demographic information collected was not representative of the larger population of the Ogden area, but is what is typically seen at the farmers market. This leads to other questions like; why are the lower income populations not coming to the market and what sources are they using to purchase fresh fruits and vegetables, and what can be done to draw in the people who live in the food desert areas to come to the farmers' market?