

•••••
8th Annual
Undergraduate Research
Symposium and
Celebration

Students from all colleges and departments
are invited to make oral, performance
visual art, and poster presentations
of their undergraduate research projects
scholarly, or creative activities.

•••••

u can
ake it
ched
oints
ange
is the
ll that
ins do
Think
The only
Time we
think we can
is when
hed
kpres
Eni
IE
nem

• Creativity
• of the min
• and of all
Inspire



Acknowledgements



The Office of Undergraduate Research would like to thank Amy Douangdara, Valerie Frokjer, Beth Koford, Tyler Barnum, and Ryan Thomas for organizing this event, Haden Hamblin for designing all event promotional material and this program, and all the campus staff who worked behind the scenes to make today's event possible. We want to especially thank our oral session moderators and all the students and faculty participating in today's celebration.

Schedule

9:00 – 11:00 a.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

10:30 a.m. – 12:15 p.m. Oral Session 1

12:15 p.m. – 1:00 p.m. Break
 Refreshments will be served

1:00 p.m. – 2:45 p.m. Oral Session 2

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

Table of Contents

Welcome Messages4
 F Ann Millner, Ed., President
 Michael Vaughn, Ph. D., Provost
 John F. Cavitt, Ph. D., Director, Office of Undergraduate Research

Poster Display Listing8

Oral Presentation Schedule10

Abstracts

College of Arts & Humanities12

Bachelor of Integrated Studies18

John B. Goddard School of Business & Economics20

Jerry and Vicki Moyes College of Education24

Dumke College of Health Professions28

College of Science38

College of Social & Behavioral Science60

Welcome Messages



Welcome to the Eighth Annual Undergraduate Research Symposium and Celebration! I am pleased that you have joined us for this year's celebration of student innovation, creativity, and scholarship. Today, students from a variety of academic disciplines have come together to showcase their work through oral and poster presentations and we applaud their efforts.

These students have had the opportunity to experience the dynamic combination of scholarship, teaching and research: their mentors have had the opportunity to extend their knowledge and to enjoy the rewards of collaboration. In the spirit of exploration, many have also reached out to our community to learn.

I hope you enjoy today's celebration of their experiences and accomplishments. These students' work, with the guidance of our dedicated faculty, is helping Weber State to grow as an institution of discovery and to create connections with our neighbors. As an institute, we appreciate both researchers and mentors for working to continue the tradition of scholarly achievement at Weber State.

F. Ann Millner
President



Across the country colleges and universities have found that undergraduate research is a powerful tool for learning and post-graduate success. Weber State University is proud of the work our undergraduate students do with faculty in conducting pure and applied research. The students' experiences prepare them for the demands of graduate education and their professional careers.

This year marks the eighth year for the WSU Undergraduate Research Symposium, which provides an opportunity for our students to share their work. I am consistently impressed with both the breadth and quality of student research presented at the symposium. Some of our students' undergraduate research has received national attention.

I congratulate our students for the quality of their work, and I extend my appreciation to the many WSU faculty who devote their time and effort to serve as mentors to our students as they pursue their research.

Michael Vaughan
Provost

Welcome Messages



On behalf of the Office of Undergraduate Research, welcome to the Eighth Annual Undergraduate Research Symposium and Celebration. This year's program includes over 60 projects from the colleges at Weber State University. Today, the entire campus community comes together to celebrate our students as they have explored their disciplines in search of answers and helped contribute new knowledge. We also celebrate today the work of their faculty mentors. These mentors are each dedicated academic professionals who give of their time and talents to help launch future scholars on their life-long journey of discovery.

Some of the projects presented are in the early stages of the research process and are thus, preliminary results. Others are completed and the students have already disseminated their work at national conferences or have published their results in peer-reviewed journals. In either case, our students are learning the value and importance of communicating and sharing knowledge to others.

Once again the presentations at this year's symposium are evidence that the pursuit of knowledge and creative expression are an integral part of the campus culture at Weber State University. Please join me in congratulating all the participants and celebrating their outstanding accomplishments. I hope you enjoy listening to, talking with and meeting the student presenters. I am certain you will be impressed by the diversity and quality of their presentations.

A handwritten signature in black ink that reads "John F. Cavitt". The signature is fluid and cursive.

John F. Cavitt
Director of Undergraduate Research

Poster Display Listing

1: Sean Bishop

Was A Luminary Of Cutting Edge Installation.
As A Costume Designer

2: Jaime Frank

Under Construction Scenic Design

3: Shaylynn Clark

Pitch Perfect: On The Road To Accurate
Pitch In Choral Setting

4: Kayla Borrego

Stress Management For Life

5: Andrew Chris

Religiosity As A Mediating Variable In Blended Family Conflict

6: Marcie Dawson

Undergraduate College Students Changing Majors

7: Nathan Marsden

Studying The Effects Of Function-Based Behavioral
Interventions For Students With Severe
Intellectual Disabilities

8: Tiauna Bates

The Impact Of Testing Strategies On
The Dental Hygiene Student

9: Burke Devlin

Second Life As An Intermediary To Dental Hygiene Education

10: Shenelle Kleyn

Direct Determination Of Iron In Whole Blood
By X-Ray Fluorescence

11: Tessnim Ahmad

Quantification Of Collagen In Wild-Type And Magp-2-
Knockout Mice

12: Tyler Anderson

Fish In Your Backyard? Finding Trout In Wasatch Front Creeks

13: Carlie Benson

Comparison Of Idiogramina Bacteriophage Isolated From The
Great Salt Lake, UT

14: Andrew Farr

An Investigation Of A Unique Plaque Morphology Produced
By A Halophage

15: Austin Farall

Seed Removal In The Dwarf Bear-Poppy
(*Arctomecon Humilis*)

16: Amanda Gentry

Reconnaissance Of Marysvale Volcanic Field,
South Central Utah

17: Seth Green

Assessment Of Stonefly Abundance And Body-Length Based
On Rainbow Trout Abundance In Burch Creek, Ogden Utah

18: Robert Jensen

Validation Of Mineral Chelates By Scanning
Electron Microscopy

19: Preston Kerr

Molecular Analysis Of Two Halophages Isolated From The
Great Salt Lake

20: Zachariah Knight

Rainbow Trout Abundance And Habitat Conditions In Creeks
Along The Wasatch Front

21: Alan Liddell

Upper Atmospheric Particulate Monitoring
And Sample Return

22: William Mohn

The Effect Of Monomeric And Polymeric Diets On Growth
And Development

23: Elizabeth Mora

Isolation And Characterization Of Cellulytic Microorganisms
From The Great Salt Lake, UT

24: Chase Naisbitt

Analysis Of Dimethicone In Skin Protection Products By Ftir

25: Brian Penman

Rapid Analysis Of Zinc Oxide In Drug Products
By X-Ray Fluorescence

26: Brice Peter

Biodegradation Of Toluene By Halophilic Bacteria From The
North Arm Of Great Salt Lake

27: Brandon Price

Use Of X-Ray Fluorescence For Quality Screening Of
Minerals Used In Dietary Supplements

28: Jennifer Shamalz

Habitat Ecology Of Pygmy Rabbits (*Brachylagus Idahoensis*)
In Northeastern Utah.

29: Thomas Simon

Novel Marinobacter-Like Organism And A Related Phage
Isolated From The Great Salt Lake

30: Amanda Truong

Identification Of Wolbachia Associated With Great Salt Lake
Brine Flies

31: Tarris Webber

Inhibition Of Clostridium Difficile By Lactic Acid Bacteria

32: Amy Friend

The Effects Of Twelve Hour Shifts On Performance In
Pharmacy Personnel

33: Alisa Garner

An Analysis Of The Effect Of Caffeine On
State-Dependent Memory

34: Katelyn Peterson

The Effect Of Task-Cueing On Optimal Decision Making:
A Dual Process Account

35: Heather Plum

A History Of The Swiss Chorus Edelweiss

36: Amy Trevethan

Comorbidity Of Substance Use And Depressive
Symptomology: A Retrospective Analysis Of Their Relation
And Trajectory Across Adolescence

37: Michael Young

Priming Optimal Decision Making On A Gambling Task:
A Developmental And Educational Study

Oral Presentation Schedule

Time	312	Ballroom C
10:30 a.m.	Michell Casteel ----- Stage Management Technics	Shalease Adams et al. ----- Determining A Heparin Response Curve For The Validation Of Aptt Reference Range On Acl Elite
10:45 a.m.	Aubrey Vickers ----- Under Construction: Dramaturgy	Ryan Bielik & Joseph Nielsen ----- Biosolids In Microbiological Growth Media
11:00 a.m.	Rebecca Briesmaster ----- Promoting Free Tax Services To College Students	David Garner et al. ----- Probiotics In Yogurt Effect On Oral Streptococcus Mutans
11:15 a.m.	Nikki VanOverbeck ----- Eating Disorder Prevention	Dana Heiner & Rachel Bown ----- Pertussis Immunity In A Sample Population Of Pregnant Women
11:30 a.m.	Shawna Rowley ----- Management Reaction To Workplace Bullying: A Structuration Response	Kyle Hueth et al. ----- Aptt And Anti-Xa Values In Antithrombin Deficient Plasma
11:45 a.m.	Justin Embry ----- Participation Of Microfinance In Rural Kyetume, Uganda	Lauren Knudson et al. ----- Analysis Of First And Second Drops Of Blood On Coaguchek Xs
12:00 p.m.	Landon Sandberg ----- Impact Of The Patient Protection And Affordable Care Act On The Individual Insurance Market	Melissa Meyer et al. ----- Human Chorionic Gonadotropic Hormone Effects On Blood Transfusion Reactions.
12:15 p.m. – 1:00 p.m. Break With Refreshments		

Time	312	Ballroom C
1:00 p.m.	Casey Settler ----- To Save Or Not To Save? Restrictions Affecting Rural Ugandans' Decision To Have Savings Accounts.	Naphavanh Phengphong et al. ----- Effects Of Hemolysis In Chemistry Analysis
1:15 p.m.	Jacob Harper et al. ----- Displays And Views Of Affection In Adulthood: The Influence Of Childhood Environment	Lauren Roueche et al. ----- Altering Red Blood Cell Abo Antigens Using A-N-Acetylgalactosaminidase And A-Galactosidase
1:30 p.m.	Sarah Ahmad ----- Effect Of High-Intensity Physical Exercise On Bdnf In Healthy Women	Brittany Russett et al. ----- The Impact Of Tanning On Cortisol
1:45 p.m.	Trista Delzer et al. ----- Prevalence Of Staphylococcus Aureus Colonization Among College Students	Allison Scheel et al. ----- The Effect Of Stevia, An Artificial Sugar, On Four Normal Intestinal Flora
2:00 p.m.	Ryan Cornelius & Melissa Meyer ----- Advantages And Barriers In Counseling Services: A Survey Of Weber State University Students	Brady Vincent et al. ----- Biomedical Analyses Of A Holistic Peanut Allergy Treatment: Naet
2:15 p.m.	Amanda-Jean Fochs ----- The Embodied Representation Of Spatial Language	Casey Whale et al. ----- The Effect Of Androgen Deprivation Therapy On Glucose Metabolism In Prostate Cancer Patients
2:30 p.m.		Cory Woolsey & Jaren Goff ----- The Effects Of Dietary-Hcg On Pregnancy Test Results
3:00 p.m. – 4:00 p.m. Poster Session and Light Snacks		

ABSTRACTS

College of Arts and Humanities

Costume Design - Under Construction

Sean Bishop (Catherine Zublin)

Poster Display 1

Performing Arts

WSUSA Undergraduate Research Travel Fellowship

Charles Mee's contemporary play "Under Construction," is largely based on the melding of two artists: Norman Rockwell, and Jason Rhoades. One, Rockwell, was a seminal figure in what we now call "Americana." The other, Rhoades, was a luminary of cutting edge installation. As a costume designer, I approached this project with this creative limitation in mind. As a collaborative art, Theater provides a perfect setting for conversation and delegation. As the rest of the creative team and I began to delve into this project, I chose to focus my design around the work of Norman Rockwell. The clothes I have designed reflect his work in tone, texture, line, and overall composition. The costumes also provide a familiar anchor in the perceived chaos that this play strives for. Therefore, my research focuses on Norman Rockwell's entire body of work, his life, his creative process, his artistic intent, and how all of those factors assimilate to this carefully crafted script. I have been invited to participate at the Kennedy Center American College Theater Festival Region 8 Design Finals. The Festival is a wonderful opportunity for me to show my work amongst my peers from across the Western United States.

Promoting Free Tax Services to College Students

Rebecca Briesmaster (Anne Bialowas)

Oral Presentation

Communications

The purpose of this study was to find an explanation to why students are failing to take advantage of the free tax service from VITA, voluntary income tax assistance, program. The study was done to understand how to advertise free services to college students. To understand these two concepts, data was collected through a survey that was given to 100 Weber State University students. The survey consisted of mostly closed ended questions and was made from analyzing past studies on this topic. The Elaboration Likelihood Model was used as the framework for this study to better understand the way different people process advertisements and the different routes they take to process the information. The study revealed that students take advantage of free services without realizing it. The students are more likely to use a service if it is not advertised as free. The data showed that students believe that free products are untrustworthy and there must be a catch if it is free. The reason students are not taking advantage of the free VITA service offered on campus is because they are unaware it is there and they are unlikely to take advantage of something that is advertised as "free".

Stage Management Technics*Michell Casteel (Catherine Zublin)**Oral Presentation
Performing Arts
WSUSA Undergraduate Research Travel Fellowship*

I was the Stage Manager for the WSU Production of *The Light in the Piazza*, March 2010. One of the tools I brought to this production is 30 years of musicianship; I read music. For this production I utilized my understanding of music to enhance the traditional stage manager's skill set. Stage managers are responsible for maintaining the director's artistic integrity of the show and the organization of all the designed elements in a specific timed sequence. This notification of timed cues is referred to as "calling the show." The timing of these cues was read from the music director's score. This ability improved the precision of the lighting, scene, and sound cues to be called down to a 32nd note efficiently. Most stage management courses and textbooks do not cover how to call the show from this very accurate score method. I feel that I could impact the field by sharing my knowledge on this successful methodology. Through collaboration with peers and mentors in this field we can develop a way to add this element to the curriculum and improve the way new students can utilize this knowledge. I have been invited to attend the Kennedy Center American College Theater Festival (KCACTF). This honor is not bestowed upon every college student it is by selection only after a nomination and committee selects him or her. Each selected Stage Manager will be responsible to work with a new production at the festival; and call it so each can showcase the skills they have acquired. Following the show I will meet with my mentors and discuss what techniques I used worked successfully and those that did not. This information will then be used to enhance even further the method I hope to bring to the college curriculum and my professional career.

Pitch Perfect: On the road to Accurate Pitch in a Choral Setting*ShayLynne Clark (Mark Henderson)**Poster Display 2
Performing Arts*

Staying on the correct pitch in solo singing is difficult, but when in a multi-voice, multi-part choir, singing on pitch becomes an astronomical issue. Maintaining pitch in a group setting is difficult for many reasons, including the individual difference in vibrato pulses, as well as differences in the tone and physical structure of an individual's singing apparatus. Individuals participating in a small choral setting must learn to blend their individual voices with the 'group voice.' This is accomplished by having individuals understand their voice type, and understand if they generally sing a little sharp or flat. Modifying individual voices to be on the correct pitch (give or take 2 cents) adds to the effectiveness of that individual within the choral setting. This experiment aims to help the individual voices within the choir augment their own instrument to the ideal pitch by having each member of the small group choir use a chromatic tuner, enabling them to see their own pitch in reference to the rest of the group, thus allowing individuals to augment their own voices to the correct pitch, helping the group achieve optimum, accurate and efficient pitch. There is not much literature on altering pitch of choral groups in this way, so this is primarily a pilot study, hopefully leading to more research regarding the delicate balance of individual voices in group choral settings.

Under Construction - Scenic Design*Jaime Frank (Catherine Zublin)**Poster Display 3
Performing Arts
WSUSA Undergraduate Research Travel Fellowship*

During this fall semester 2010, The Department of the Performing Arts produced Charles Mee's *Under Construction* as part of their main stage season. I received the opportunity as a student designer to design the set for this production. This opportunity allowed me to apply design techniques, ideas, and concepts I have learned in my Stage Scenery, Scenic Design, and Scene Painting classes in a real life application. In the analysis of the script, I realized that there are two major conceptual focal points in the play, two visual artists: Norman Rockwell, a 1950's American painter, and Jason Rhoades, a contemporary American installation artist. The research allowed me to understand what inspired these two artists and how I might represent that in my own work. Set design is a process; one idea that resonated with both Sean Bishop, the costume designer, and me came from the Norman Rockwell painting *The Connoisseur*. Together we realized that the best way to incorporate the two artists would be for the costumes to embrace the 1950's, representing the American people, while the set would be inspired by Jason Rhoades works, the chaotic life of the American. I created over twenty small sketches, a quarter-inch scale working model, a quarter-inch scale final model representing the finished product, a three-dimensional computer generated model, and over ten pages of blue prints that were used to specifically show how the set was to be constructed by the scene shop. I have been invited to participate in showcasing my scenic design, the process and documentation of finished work, at the region festival for KCACTF in Los Angeles, CA in February 2011. The festival is an excellent opportunity to see other works from other colleges and other student designers. I would like to continue showcasing my work to other researchers and artists alike.

Management Reaction to Workplace Bullying: A Structuration Response*Shawna Rowley (Susan Hafen)**Oral Presentation
Communications*

The word bullying often conjures up images from the playgrounds of our youth, where schoolyard bullies dominated our interactions. Fast forward to today, where the bully is all grown up and now creates havoc in the workplace. Workplace bullying is a form of harassment, yet it is not illegal in the United States. This presentation will discuss how I conducted a survey of 114 employees at Weber State University, Utah State University, and Salt Lake Community College to determine their past experiences with workplace bullying and the words they use to describe workplace bullying behavior. Participants were allowed to complete the survey anonymously. Once I gathered and analyzed the data, I presented the findings to the people in management positions of the departments that participated in the survey. I facilitated a focus group with these managers to determine their reactions to the data. I related the findings of the survey and the focus group to the communication theory of Structuration, which discusses how human actions are performed within the context of a pre-existing social structure.

*Eating Disorder Prevention**Nikki VanOverbeck (Anne Bialowas)**Oral Presentation
Communications*

As many as 10 million females in the United States are fighting a life and death battle with an eating disorder according to the National Eating Disorders Association. Prevention is a critical tool in fighting this battle. This study will illustrate that eating disorder prevention programs need to be available to elementary age girls. If we wait until the teen years to address this issue, oftentimes the prevention program is too late. This topic of eating disorder prevention is important because many girls are fighting issues of distorted body image and an unhealthy view of what is a “normal” body. By using the Elaboration Likelihood Model, the topic of eating disorder prevention can be analyzed by whether or not elementary age children are capable of critically thinking about the issue of eating disorders, and therefore having a long-term positive attitude change regarding this issue. Through the use of exposure to eating disorder prevention videos and discussion, I found that some younger girls are able to critically think about the issue of eating disorders. Also, when critical thinking is not possible, girls will rely on peripheral cues to make some attitude changes.

*Under Construction - Dramaturgy**Aubrey Vickers (Catherine Zublin)**Oral Presentation
Performing Arts
WSUSA Undergraduate Research Travel Fellowship*

As Dramaturg for Weber State’s production of *Under Construction*, my function was to research the text of the play, both the sources and in general and to help the director answer the question “How can our company produce this play in a meaningful way for our students and audience”? *Under Construction* is a contemporary theatre collage by Charles Mee, asking the question, “What is America”? It was created in cooperation with SITI Company and was intended to remain a collaborative process, being changed each time by the company producing it. Dramaturgy in this particular production was largely responsible for understanding what was originally put in the play and why, so that those things could be manipulated, changed and enhanced while still maintaining the essence of the original work. Pulling from 1950’s PSA video footage, magazine articles, newsreels, interviews and contemporary artwork, I researched the story of America Charles Mee wanted to tell through his play and gave the separate pieces a context in history and within the play. Dramaturgy is playing an increasingly relevant part of contemporary theatre, especially in works like *Under Construction* and exploring it as a means of influencing theatre provided many interesting insights into the direction theatre is taking in our world today.



Bachelor of Integrated Studies

Stress Management for Life

Kayla Borrego, Aimee Jacob (Patricia Cost)

Poster Display 4

Bachelor of Integrated Studies

The term “stress” in regards to physiology is defined as “A specific response by the body to a stimulus, as fear or pain, that disturbs or interferes with the normal physiological equilibrium of an organism.” The effects it can have on those attempting to gain freedom from substance abuse can be astonishing. In an effort to make this healing process easier, we partnered with the Alcohol and Chemical Treatment (ACT) center at Ogden Regional Medical Center in Ogden, Utah to teach their patients useful techniques for managing psychological stress. These techniques included mantra meditation, yoga, nutrition, physical activity, and relaxation exercises. Our interventions took place in the Alcohol and Chemical Treatment center’s facility in October 2010 and were comprised of four classes lasting approximately 45 minutes each. The first intervention followed a lecture/discussion format. The patients were taught the physiological response to stress, including the fight-or-flight response and the changes in major systems of the body that occur during stress. Patients were given basic information on nutrition and exercise and scientific evidence to support the importance of including both in their lives to combat stress. The next three interventions were more practical in nature. The patients practiced proper mantra meditation technique, including choosing a mantra (a single word or short phrase) and repeating it in the mind. They explored basic yoga poses and the value of balance, strength, and flexibility in the stress relief process. Finally, they discovered the value of guided relaxation in increasing energy stores.



John B. Goddard School of Business & Economics

Participation of Microfinance in Rural Kyetume, Uganda

Justin Embry (Therese Grijalva)

*Oral Presentation
Economics
Eccles Undergraduate Research Scholarship*

Microfinance has become increasingly popular in the developing world. This research looks at villages in Kyetume, Uganda and will determine the probability of someone applying for a microfinance loan based on certain economic variables. Microfinance has been popular in the media because of the success and failures that the financial market has been known for. From OLS regression, we can predict what obstacles the people in Kyetume will face when deciding to take out a loan. This will help the microfinance sector become more successful.

Impact of the Patient Protection and Affordable Care Act on the Individual Insurance Market

Landon Sandberg (Therese Grijalva)

*Oral Presentation
Economics
Nye Undergraduate Research Scholarship*

My research examines two controversial provisions in the Patient Protection and Affordable Care Act (PPACA) and its potential impact on the individual insurance market. The two provisions of the PPACA I examined were: (1) a mandate that requires individuals to purchase health insurance or pay a penalty; and (2) universal acceptance for all those that want to purchase health insurance regardless of any pre-existing conditions. I designed lottery choice experiments that reflected actual costs and probabilities associated with purchasing health insurance before the PPACA takes effect and after the PPACA takes effect, for both sick and healthy individuals. I tested whether the individual mandate maintained or increased the number of people with health insurance or decreased the number of people with health insurance given universal acceptance. The results gathered from these experiments can be used as an indicator on how these two controversial provisions will influence behavior when the entire PPACA becomes effective in 2016.

To Save Or Not To Save? Restrictions Affecting Rural Ugandans' Decision to Have Savings Accounts

Casey Stettler (Doris Geide-Stevenson)

Oral Presentation

Economics

Denkers Undergraduate Research Scholarship

Saving money in savings accounts is very difficult for people in Sub-Saharan, Africa. The Sub-Saharan region has some of the lowest savings rates in the world. We focused in on Kyetume, Uganda to study the restrictions, people face, to save on a micro-level. The purpose of this study was to identify the choice individuals make to have an active savings account. We administered 400 surveys within a three-kilometer radius around Kyetume. The surveys were limited in functionality by the information available to us at the time of departure from the United States. There are reasons to explain savings decisions that were not addressed that could possibly be explained within the model; however, the results still show that people face restrictions that alter their choice in opening a savings account. Using linear regression has allowed us to create a basic equation to predict the odds of a person having an open savings account based on gender, household size, age, hours earning income per week, walking distance in km, been inside a bank, knowing someone with a bank account, and weekly income.



**Jerry and Vickie Moyes
College of Education**

***Religiosity as a Mediating Variable in
Blended Family Conflict***

Andrew Chris, Michelle Burton (Paul Schvaneveldt)

*Poster Display 5
Family Studies*

Denkers Undergraduate Research Scholarship

The purpose of this study is to survey religiosity's mediating impact on blended family conflict by examining how it interrelates with family communication, cohesion, and marital commitment. Previous research involving intact family religiosity has established a relationship with family conflict as being a positive mediating variable. A lesser body of research is available when assessing religiosity's impact in a blended family environment, and this current study aims to increase the body of knowledge. Subjects will be recruited from the community and asked to fill out a survey assessing the domains of family religiosity, family communication, family cohesion, marital commitment, and family conflict. Statistical analysis will then be conducted on the collected data to assess religiosity's impact on conflict in a blended family environment.

Undergraduate College Students Changing Majors

Marcie Dawson, Tina Palick, Celeste Pilcher (Wei Qiu)

*Poster Display 6
Child and Family Studies*

Undergraduate college students change academic majors for many different reasons. This study investigated different influences on the decisions made by undergraduate students to change their majors while they were in college. Theoretical theories were based on the works of Erikson and Marcia's identity development and used as a framework for the change of majors by college students. Data was collected from 204 surveys from various classes at Weber State University (WSU). Of the 204 completed surveys 131 were female and 73 were male. These students' were enrolled in the fall semester 2009. The instrument was a survey that consisted of questions on student's age, academic status, number of major changes, and positive and negative influences regarding those major changes. Results of the study showed that the length of college attendance was a significant influence on undergraduate student's decisions to change academic majors. Those students who were registered in college for longer periods of time were more likely to change their majors. Other results included females changing their majors more than males. It was found the 40% of WSU undergraduates never changed their major while 36% changed their major once and 24% changed it more than once.

***Displays and Views of Affection in Adulthood:
The Influence of Childhood Environment***

*Jacob Harper, Cydney Viall, Angela Ward, Alyssa Harper, Denae Hoog
(Wei Qiu)*

*Oral Presentation
Child and Family Studies*

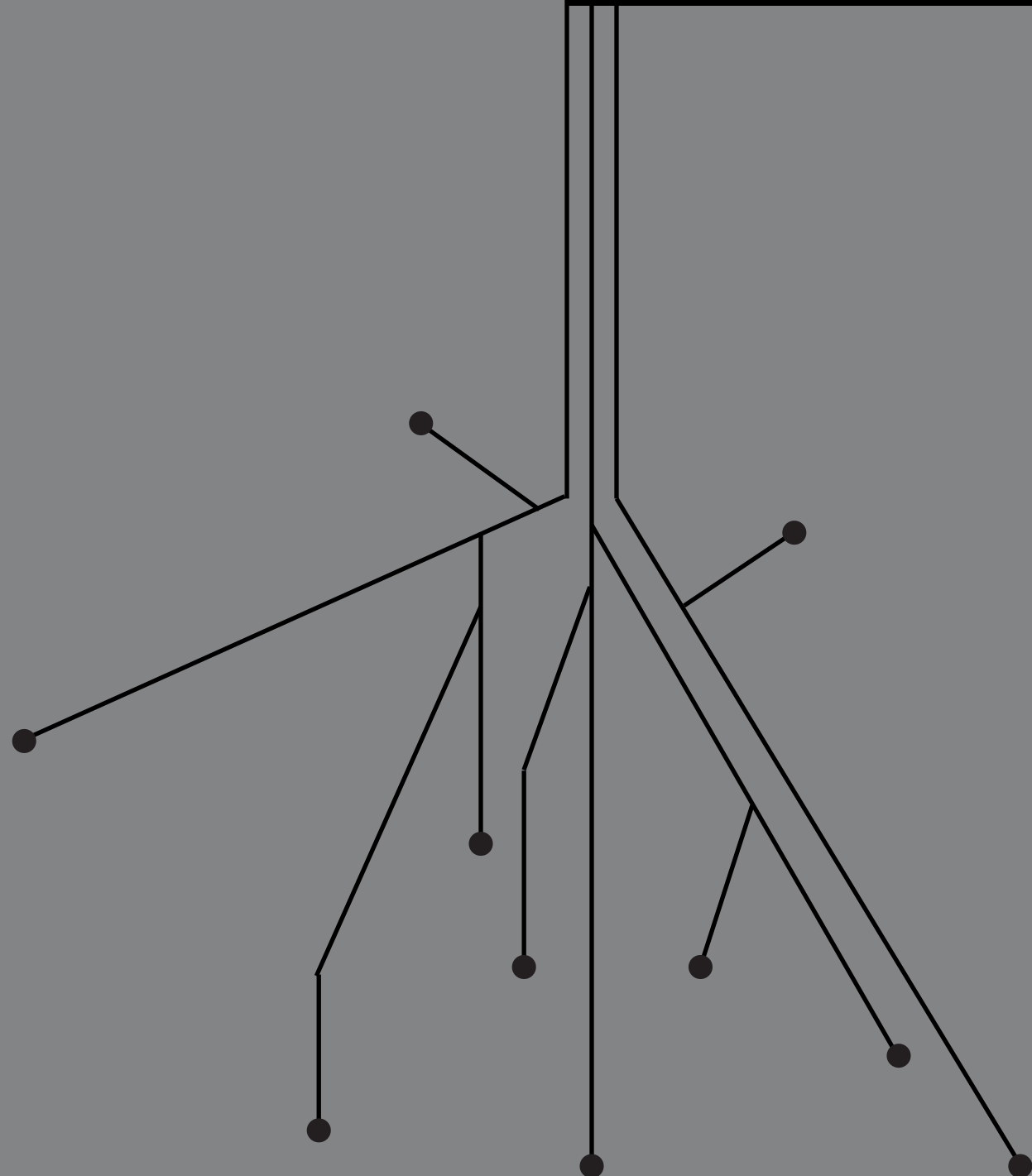
In the earliest years of ones' life a sculpting process is begun in which people are being shaped into who they are and will be. Ones' childhood has a powerful influence over the type of adult they are to become, which raises important questions concerning the strength and impact of this influence. This study focuses on affection in these life stages and provides new understanding and perspective regarding the connection between them. The purpose of this study is to find and analyze the correlations that exist between the affection that is experienced in childhood and the displays and views of affection that are used in adulthood. Results suggest that the affection experienced and viewed in childhood, along with the development of trust and the degree to which the physiological needs are met, significantly correlate with how adults express affection, their perceptions of it, and their general sense of well-being. Religiosity and ethnicity were not found to be significant factors in impacting the displays of affection in adulthood. One limitation of the study is a deficiency of diversity in the sample. Studying the Effects of Function-Based Behavioral Interventions for Students with Severe Intellectual Disabilities

Nathan Marsden (Natalie Williams)

*Poster Display 7
Teacher Education*

This study was conducted to evaluate the effectiveness of a function-based intervention to address off-task behavior for a male high school student with severe intellectual disabilities. The dependent variable was the amount of time the student was engaged in off-task behavior during vocational tasks, which consisted of the student lowering himself from standing, until lying in the prone position on the floor, folding his arms together and resting his head on his arms. Based on functional assessment data, escape and attention were both identified as maintaining reinforcers. The independent variable was a two-minute break, with access to attention from peers or staff. To verify the existence of a functional relationship, a reversal design was implemented. During the baseline phase, the average duration of off-task behavior was 10.62 minutes. In the intervention phase, the average duration was 0 minutes. The average duration during the reversal phase was 8.47 minutes, indicating an increasing trend. During intervention reinstatement, the average duration was 0.04 minutes. These results support the use of function-based interventions in an applied setting. The author will present data that pertain to all phases of the study, and discuss implications for further practice, particularly as applicable to students with intellectual disabilities.

Dumke College of Health Professions



Determining a Heparin Response Curve for the Validation of Aptt Reference Range on Acl Elite

Shalease Adams, Tarris Webber, David Sevy, (Kara Hansen-Suchy)

*Oral Presentation
Clinical Laboratory Science*

Anytime a new lot number of aPTT (activated partial thromboplastin) reagent is used, the College of American Pathologists (CAP) requires an evaluation of a heparin response curve and of the current therapeutic reference range. We will collect at least 30 anti-coagulated samples from patients on heparin therapy at Davis Hospital and run an aPTT assay. The remaining plasma will be frozen at -20° and saved until we can run the heparin assay. A heparin response curve, aPTT values vs. the concentrations of heparin in each sample, will be plotted and compared to previous curves for any significant differences. If there is a significant difference in responsiveness, the therapeutic reference range for aPTT will need to be adjusted. This is done using the aforementioned heparin response curve. The new therapeutic range of aPTT values corresponds to a specific, predetermined concentration of heparin. Adjusting the reference range may be difficult for clinicians to adjust to, but it is critical that the range is current so the dosage of heparin given to each patient is correct.

The Impact of Testing Strategies on the Dental Hygiene Student

Tiauna Bates, KaDee Hoffer, Kailene Wallentine, (Kami Hanson)

*Poster Display 8
Dental Hygiene*

Weber State University has recently tried out a different testing strategy for their students by having them take the competency exams at an earlier time than other educational institutions. Because the idea of taking competency exams earlier is relatively new to the Dental Hygiene program at Weber State University, an evaluation of the efficacy of the decision to test early should be carried out. Finding out the advantages and/or disadvantages of early test taking could prove to be very beneficial to dental hygiene students and even faculty in the future regarding increased confidence, competence, and successful employability. Due to the fact that dental hygiene students will continue to take these exams, it's prudent to look into this process for the best outcome. Possessing an understanding of this will increase the success, strength, and prestige of our program here at Weber State University. Research is currently in progress and will be completed at the time of the Spring Symposium at Weber State University.

Biosolids in Microbiological Growth Media*Ryan Bielik, Joseph Nielsen (Travis Price)**Oral Presentation
Clinical Laboratory Science
Denkers Undergraduate Research Scholarship*

Research suggests that certain bacteria have the ability to thrive on nutrients left behind by other dead bacteria. Although there has been experimentation with various media ingredients to enhance bacterial growth, the idea of using dead bacteria as a nutrient source in microbiological growth media has not yet been explored. A potential source of dead bacteria and needed microbial nutrients can be found in biosolids, which are microbes that are used and discarded after public wastewater treatment. Standard nutrient sources for sheep blood agar and chocolate agar will be substituted with biosolids. The growth of organisms on these new plates will be compared to the growth on unaltered plates to evaluate biosolids' nutrient potential. Seven microorganisms have been selected as test subjects and include: *Escherichia coli*, *Staphylococcus aureus*, *Streptococcus agalactiae*, *Streptococcus pneumoniae*, *Moraxella catarrhalis*, *Enterobacter cloacae*, *Haemophilus influenzae*. These bacteria have been chosen because they represent common isolates in a clinical microbiology laboratory. Biosolids stand as a cheap, effective and abundant means of providing nutrients to the growth of microorganisms in a laboratory setting.

Second Life as an Intermediary to Dental Hygiene Education*Burke Devlin, Eric Hall (Kami Hanson)**Poster Display 9
Dental Hygiene*

Second Life (SL) is an online 3-dimensional virtual world. About 3 years ago it had about 100,000 members, now it registers about 100,000 new members each month. Of those members, large numbers are educators and K-20 institutions that embrace SL as an instructional and social tool. As students in dental hygiene, we want to explore SL with our faculty for its potential uses in our education. Our first efforts will focus on gaining basic literacy's within the environment and then to investigate those best practices for education in use by other institutions. Second, we have several activities planned in SL with other students and educational groups. Our presentation will focus on presenting those outcomes. Our research is currently ongoing but will be completed and ready to present in June 2011 for the ADHA annual session. Our expectation is to share our knowledge and experience with other dental hygiene students and educators so that SL can be used teaching and potential collaborations in the future. We have found that virtual worlds like SL are not toys, but complex-evolving models that have application for multi-disciplinary applications.

Probiotics in Yogurt Effect on Oral Streptococcus Mutans*David Garner, Mitch Cooney, Scott Fannesbeck (Scott Wright)**Oral Presentation
Clinical Laboratory Science
Denkers Undergraduate Research Scholarship*

Do probiotics found in yogurt affect the population of *Streptococcus mutans* in the oral cavity? *S. mutans* is the cause of many common and extensive oral infections in 95% of the general United States population. In a double blinded study of 40 participants ages 18-40, participants will be divided into two groups. Group 1 will eat yogurt containing live probiotic organisms. Group 2 will eat sterilized yogurt without live probiotic organisms. The participants will be evaluated for nine weeks. They will begin with three weeks of not eating yogurt, followed by three weeks of eating yogurt, and will finish with three weeks of not eating yogurt. The *S. mutans* population will be evaluated using Dentocult® SM Strip Mutans kits. Previously published research, completed in Finland, suggests live cultures will reduce the population of *S. mutans* in the oral cavity. There have been no previous studies done in the United States. This research could add to preventative dental treatment options, especially for people allergic to medication or with diseases prohibiting surgery.

Pertussis Immunity in a Sample Population of Pregnant Women*Dana Heiner, Rachel Bown (Kara Hansen-Suchy)**Oral Presentation
Clinical Laboratory Science
Nye Undergraduate Research Scholarship*

Recent outbreaks of pertussis, more commonly known as whooping cough, and a steady increase of nationwide reported cases, have brought attention to a once common childhood disease. Prior studies have demonstrated that mothers-to-be, who have immunity to pertussis, will transfer a comparable amount of immunity to their newborns, giving them some protection until immunizations can begin. In consideration of this, it is important to determine if pregnant women have detectable levels of immunity to *Bordetella pertussis*. Blood samples were taken from ninety-five pregnant women age twenty-five and older to measure their antibody levels of pertussis. The testing will be performed at ARUP Laboratories using an ELISA method specific for the pertussis IgG antibody. The research findings may be used to raise awareness for the importance of a pertussis booster to prevent the spread of this disease, not only for the general public, but particularly for mothers-to-be and their newborn children.

aPTT and anti-Xa Values in Antithrombin Deficient Plasma*Kyle Hueth, Chris M. Lehman, MD, Shenelle Kleyn (Janet Oja)**Oral Presentation
Clinical Laboratory Science*

Heparin anti-Xa and aPTT assays are clinically relevant tests for monitoring patients on heparin therapy. The heparin test system directly measures the drug concentration, but is dependent on a coagulation protein, antithrombin (AT), that is often found at lower concentrations in critically ill patients. When antithrombin concentrations are <40%, plasma heparin concentrations can be underquantitated leading to potential errors in heparin therapy. However, it has been argued that this underquantitation is in fact an accurate representation of the anticoagulated state of the patient, since heparin requires AT to exert in vivo anticoagulation. This study will compare aPTT and anti-Xa levels in heparinized, pooled normal plasma (commercially available) to investigate if aPTT values, a non-antithrombin dependant coagulation assay, indicate a state of anticoagulation when anti-Xa assays have underquantitated heparin levels due to antithrombin deficiency. Using the Rotachrom assay on the Stago compact we will determine anti-Xa values and correlate them to aPTT values on heparinized pooled normal plasma that has varying levels of AT deficiency.

Direct Determination of Iron in Whole Blood by X-ray Fluorescence*Shenelle Kleyn, Shalease Adams, R. Devin Roane, Firas Harb, Yasmien Simonian (Edward Walker)**Poster Display 10
Clinical Laboratory Science*

Iron content in blood is an important diagnostic tool and is among the most commonly performed tests in modern medicine. Currently, the majority of iron in blood is not measured directly, but is determined indirectly by measuring either by counting red blood cells or colorimetric determination of total hemoglobin. This study directly determines the actual concentration of iron in the blood utilizing X-ray fluorescence (XRF), regardless of its oxidation state or location. Samples of blood ranging across clinically-relevant concentrations of iron will be measured in the ranges of 40-180 ppm, which corresponds to 5-20g/dL of hemoglobin. Removal of red blood cells by centrifugation allows similar XRF analysis of only serum iron. The values from XRF are compared to the more traditional clinical testing methods as well as inductively-coupled plasma optical emission methods. We anticipate that this rapid analytical method for testing total iron in whole blood will add a new diagnostic tool to assist in clinical diagnoses.

Analysis of First and Second Drops of Blood on CoaguChek Xs*Lauren Knudson, Mandy Griego, Daryl Blackwell (Kara Hansen-Suchy)**Oral Presentation
Clinical Laboratory Science
Gardner Undergraduate Research Scholarship*

The CoaguChekXS is a point-of-care analyzer used by health care professionals to monitor the effects of blood thinners. The analyzer measures the formation of a clot and gives immediate results. Individuals at risk of developing life-threatening blood clots require careful monitoring of drug levels. The dosage of medication is dependent on the results of the clotting times; therefore, the accuracy of such analyzers is essential. The instrument's instructions strongly emphasize using the first drop of capillary blood, however no rationale is provided. It has been observed that the first drop of blood is often difficult to collect onto the test strip. Instead, the second drop is sometimes used, though not recommended. This study will determine if there is a significant difference between the first and second drops of capillary blood when using the CoaguChek XS analyzer. Approximately ninety volunteers will donate capillary blood and their clot times will be determined for the first and second drops of blood. Results will be statistically analyzed for a significant difference. If there is no significant difference and a second drop is acceptable to use, there would be no need for an additional capillary stick, nor the use of an additional test strip.

Human Chorionic Gonadotropic Hormone Effects on Blood Transfusion Reactions*Melissa Meyer (Kara Hansen-Suchy)**Oral Presentation
Clinical Laboratory Science
Gardner Undergraduate Research Scholarship*

Human chorionic gonadotropic hormone or hCG is produced by various tissues including the placenta of pregnant women during the first trimester of pregnancy. Prior studies indicate the hCG hormone causes a reduction of white blood cell activity to occur near the area of placental attachment inside a mother's uterus. The immunosuppressant properties of hCG protect the newly developing fetus from being eliminated by the mother's immune system. These same immunosuppressant properties of hCG have been used in several experiments involving autoimmune disorders, viral infections and transfusion reactions. Human chorionic gonadotropic hormone will be tested for its ability to suppress immune reactions in human blood products by preventing hemolysis and agglutination. Both hemolysis and agglutination are present during an immune response to foreign red blood cells. Red blood cells coated with hCG will be measured for the percentage of hemolysis and agglutination found between incompatible blood products. If hCG is effective as an immunosuppressant it can be used to reduce the damage caused by incorrect blood transfusion or adverse transfusion reactions.

Effects of Hemolysis in Chemistry Analysis

Naphavanh Phengphong, MongolaYang, Abdulmonem Alrashed
(Gary Nielsen)

Oral Presentation
Clinical Laboratory Science

Hemolysis is one of the leading unsuitable specimens for chemistry analysis that effect several clinical test results. ARUP participated in the College of America Pathologists Interfering Substance Survey 2010. There were 25 chemistry tests performed on the Roche Modular were affected by hemolysis. This discrepancy between CAP IFS survey and the vendor package could be differences in materials, differences in data analysis, or differences in instrument performance. Conducting this research is essential in established appropriate hemolysis base line for each chemistry analysis. In this experiment, samples will be prepared with hemolysis according to Clinical and Laboratory Standard Institute (CLSI) guidelines. The necessary IFS samples will be obtained. On the Roche Modular instrument, freshly prepared samples will be run along with IFS samples. Data from both materials will be analyzed in the same manner. 10% systematic bias will be allowed which is the external influence that may affect the accuracy of test results. At the end of this research, the collected data will provide information if there is any true discrepancy between CAP IFS survey and Vender Package claims.

Altering Red Blood Cell Abo Antigens Using A-N-Acetyl-galactosaminidase and A-Galactosidase

Lauren Roueche, Millie Bateman, Alexis McCracken (Janet Oja)

Oral Presentation
Clinical Laboratory Science
Eccles Undergraduate Research Scholarship

ABO incompatibilities are a leading cause of transfusion related fatalities in the United States. One in 33,000 transfused units leads to an ABO incompatible transfusion reaction. The enzymes α -N-acetylgalactosaminidase and α -galactosidase have been found to cleave A and B antigens from red blood cell surfaces, thus inhibiting the body's ability to recognize transfused red blood cells as foreign. The purpose of this research is to determine if α -N-acetylgalactosaminidase and α -galactosidase have the ability to detect their appropriate antigen when more than one red blood cell population is present. In order to accomplish this, a transfusion reaction will be simulated in vitro by adding a one milliliter of incompatible packed red blood cells to ten milliliters of whole blood, mimicking an ABO incompatible transfusion reaction. The antigen-specific enzyme will be added to the simulated reaction. An ABO blood type will be performed to determine if all foreign A or B antigens have been cleaved, thus making the transfused red blood cells immunologically null. With this knowledge, and future research, α -N-acetylgalactosaminidase and α -galactosidase may be utilized to aid in the recovery from an ABO incompatible transfusion reaction and reduce related fatalities. This has potential to alter future transfusion reaction protocols.

The Impact of Tanning on Cortisol

Brittany Russett, Jordan Graves, Ben Bauter (Travis Price)

Oral Presentation
Clinical Laboratory Science
Gardner Undergraduate Research Scholarship

Studies have shown that UV light, such as that used in tanning beds may have negative effects on health such as sunburns, skin cancer and pregnancy complications. However, some show the positive effects such as increased vitamin D, increased serotonin and decreased symptoms of psoriasis. Exposure to UV light has also been correlated with a reduction in stress, but studies have failed to adequately measure this effect. Cortisol is secreted as a response to rising stress levels, and as a result it can be used as a biochemical marker to quantify the stress a person's body is experiencing. College students may experience increased stress levels therefore participants for this study were selected from students currently enrolled at Weber State University. This study will be conducted over a three month period during which cortisol levels will be collected prior to UV light (tanning) exposure to establish a baseline, during a month of routine exposure, and a month following to determine the return to baseline. The purpose of this study is to determine if UV light has a positive effect on stress levels, as shown by fluctuations in cortisol.

The Effect of Stevia, an Artificial Sugar, on Four Normal Intestinal Flora

Allison E. Scheel, Teresa P. Reyes, Rebecca A. Fox (Scott Wright)

Oral Presentation
Clinical Laboratory Science
Eccles Undergraduate Research Scholarship

With the recent influx of artificial sugars into the market it is important to understand what effect these chemicals have on the human intestinal tract. Stevia is an artificial sugar substitute, derived from the Stevia rebaiana plant, which has recently been made available in the U.S. This research project seeks to determine if Stevia has any effect on normal intestinal flora, as compared to regular table sugar. Table sugar will serve as the baseline for growth. E.coli, L. acidophilus B. bifidum, and B. fragilis will be grown in varying concentrations of Stevia and in table sugar. These cultures will then be plated and bacterial growth will be quantified in order to determine if there is any significant difference in bacterial growth between Stevia and table sugar.

Biomedical Analyses of a Holistic Peanut Allergy Treatment: NAET

Brady Vincent, Dayne Bonzo, Dan McEntire (Yasmen Simonian)

*Oral Presentation
Clinical Laboratory Science
Denkers Undergraduate Research Scholarship
NCUR 2011 Participant*

Across the United States the use of holistic medicine is being used as an alternative or in combination to traditional western medicine. Nambudripad's Allergy Elimination Technique (NAET) founded by Devi Nambudripad M.D., D.C., L.Ac, Ph.D, is a popular eastern-based medicine, and is practiced primarily by licensed chiropractors. One such treatment is for peanut allergies which involves a series of kinesiology and energy balancing tests. The differences of allergy treatment techniques applied by western versus eastern practitioners are based primarily on the definition of allergy. Although definitions and techniques may vary, the outcomes must be the same - that is, desensitization to the offending allergen. The objective of this study is to analyze the NAET peanut allergy treatment by western immunological measurements. With the cooperation of NAET practitioners, participants with peanut allergies will have their blood tested for peanut specific IgE and IgG levels, as well as the inflammation marker tryptase. The blood will be collected pre- and post-treatment and will be tested by validated methods at ARUP laboratories. It follows that if a participant is desensitized to the allergen, there would be a measurable biomedical response to this form of holistic allergy treatment.

The Effect of Androgen Deprivation Therapy on Glucose Metabolism in Prostate Cancer Patients

Casey Whale, Shaun Webb, Austin Oakelberry, Brant Adams (Gary Nielsen)

*Oral Presentation
Clinical Laboratory Science
Nye Undergraduate Research Scholarship*

Does gonadotropin-releasing hormone (GnRH) agonist therapy, a common treatment for prostate cancer, amplify the risk of developing diabetes mellitus? Many observational studies have evaluated the potential risks of taking GnRH agonist, a form of androgen deprivation therapy (ADT), to treat prostate cancer. These studies have concluded that there may be an increased chance of developing adult onset diabetes mellitus due to undergoing this therapy. They have failed, however, to provide adequate biochemical evidence supporting this relationship. By measuring glucose metabolism and testosterone markers, metabolic changes can be identified that show a correlation between ADT and diabetes mellitus. Testing these analytes in prostate cancer patients will take place prior to receiving treatment and after three months of GnRH agonist therapy. The intent of this study is to explore the possibility of a noteworthy correlation between GnRH agonist therapy and inhibited glucose metabolism, which is indicative of diabetes mellitus.

The Effects of Dietary-hCG on Pregnancy Test Results

Cory Woolsey, Jaren Goff (Gary Nielsen)

*Oral Presentation
Clinical Laboratory Science
Denkers Undergraduate Research Scholarship*

The purpose of the study is to see if dietary-hCG injections cause non-pregnant women to obtain false-positive pregnancy test results. Common clinical and home pregnancy tests detect blood or urine levels of the hormone known as human chorionic gonadotropin (hCG), which is the same hormone used in the hCG diet. The study consists of 40 non-pregnant and non-menopausal women who are tested for pregnancy either before and during, or during and after their course of dietary-hCG injections. Should any false-positive pregnancy tests show up in experimental testing, then: 1) clinical professionals would be advised to question women to see if they are in the course of taking dietary-hCG injections, prior to performing a pregnancy test. This would be done to avoid the possibility of misinterpreting a false positive on the test. 2) Labels and package inserts for both the dietary-hCG supplements and pregnancy tests would need to have warnings of possible false-positive pregnancy test results during the course of the hCG diet. Experimental data are expected to indicate that dietary-hCG injections cause non-pregnant women to obtain false-positive pregnancy test results.

College of Science

Effect of High-Intensity Physical Exercise on BDNF in Healthy Women

Sarah Ahmad (Matthew Schmolesky)

Oral Presentation
Neuroscience
Gardner Undergraduate Research Scholarship

Brain-derived neurotrophic factor (BDNF) promotes neuronal function, development, growth, repair, and survival (Vega, et al., 2006), and modulates brain plasticity, learning, and memory (Patterson, et al., 1996). Intense exercise increases circulating BDNF, and BDNF has been shown to mediate exercise's therapeutic benefits for the brain (Russo-Neustadt & Chen, 2005). In the current study (nearing completion) we are examining the effects of high-intensity, short-duration exercise on serum and plasma BDNF levels in healthy women, age 18-28, who are not using hormonal contraceptives. Forty subjects were randomly assigned to either the experimental or the control condition, and subjects in the experimental condition exercised at 80% of their maximum heart rate for 20 minutes. While control subjects did not exercise, they underwent identical experimental procedures as the experimental subjects. Blood draws were conducted just prior to and immediately following exercise. Since the hormonal changes associated with the menstrual cycle influence circulating BDNF levels (Pluchino, et al., 2009), blood samples will be analyzed for BDNF and estrogen. While similar studies have utilized male subjects, this study will, for the first time, assess the effect of high-intensity exercise on serum and plasma BDNF levels in females at different stages of the menstrual cycle.

Quantification of Collagen in Wild-Type and MAGP-2-Knockout Mice

Tessnim Ahmad, Barbara Trask, Todd Johnson (Barbara Trask)

Poster Display 11
Zoology

Collagen is the most abundant protein in the body and is the main component of connective tissues, such as the dermis of the skin. Microfibril-associated glycoprotein 2 (MAGP-2) is hypothesized to influence the production of collagen. In order to test this hypothesis, skin samples from wild-type and transgenic mice (heterozygous and homozygous for MAGP-2 knockout) were analyzed for their collagen content using high-performance liquid chromatography (HPLC). Prior to this study, qualitative histological analysis of wild-type and transgenic mice skin revealed no apparent differences in collagen content. The next logical step is to quantify collagen in the three genotypically-distinct mice, which is the objective of the present study.

Fish in Your Backyard? Finding Trout in Wasatch Front Creeks

Tyler Anderson (Christopher Hoagstrom)

Poster Display 12
Zoology

Many small creeks flow into communities between Bountiful and Brigham City along the Wasatch Front in Northern Utah, originating in canyons that have very similar topography, but which have been isolated from one another due to community growth. Some of these creeks contain trout. The isolation of many very similar creeks allows for a very unique investigation of the factors that influence trout populations. An understanding of what factors contribute to a creek's ability to support successful trout populations will enable future management of creek habitats for recreational fishing and for re-introduction of Bonneville Cutthroat Trout. We investigated the presence or absence of trout in these creeks to determine what factors are associated with trout presence. Backpack electrofishing was conducted near the mouth of each creek's parent canyon, above most manmade structures. In general, creeks with trout were deeper, larger, and less steep. However, these features alone did not guarantee the presence of trout. Some creeks, such as Mill Creek in Bountiful and Willard Creek near Willard, contained no trout despite being relatively deep, wide, and having shallow slope and long drainage circumference. Further investigation into relatively large creeks without trout will be conducted in summer 2011.

Comparison of *Idiomarina* Bacteriophage Isolated from the Great Salt Lake, UT

Carlie Benson (Craig Oberg, Matthew Domek, and Michele Culumber)

Poster Presentation 13
MicrobiologyNye Undergraduate Research Scholarship
NCUR 2011 Participant
WSUSA Undergraduate Research Travel Fellowship

Predation by bacteriophages (phage) may play a significant role in controlling bacterial populations in hypersaline environments. Prior characterization of halophilic bacteria from the South Arm of the Great Salt Lake (GSL) revealed a number of novel *Idiomarina*-like isolates (ILI). There are only limited reports of bacteriophage specific to this genus, with none isolated from the GSL. Using ILI host bacteria, phages were obtained from GSL water samples. Relatedness of the three ILI phage hosts (SA03, SA06, and SA11) was determined by 16S rRNA analysis and were shown to be nearly 99.5% identical over the 16S rRNA gene. Host range analysis showed that phage CB04 only infected SA11 while phage CB13 only infected SA03. One purpose of this research was to determine how different these phage are when the ILI strains they infect are nearly identical. *Idiomarina* phages CB04 and CB13 were purified and phage DNA was isolated. Enzymatic digests revealed both were DNA phage. Restriction endonuclease digests with BamHI, EcoRI and Hind III suggested the two phage genomes are approximately 50-55 kb but showed no similarity in banding patterns between the phages' DNA for any of the digests. These observations could be related to the need for increased specific phage predation during times of seasonal high cell density, competition between closely related species, or acquisition of phage resistance by some ILIs. This, and future studies, will facilitate our understanding of the role phage have in the lake's microbial ecology.

Prevalence of *Staphylococcus Aureus* Colonization Among College Students

Trista Delzer, Chris Burnett, Carrie Johnson (Karen Nakaoka, Bill Lorowitz)

Oral Presentation
Microbiology
Denkers Undergraduate Research Scholarship

Staphylococcus aureus is a potentially pathogenic bacterium that colonizes the human body, especially the nares and skin, with no ill-effect. However, upon skin damage or weakened immunity, it can cause diseases ranging from minor skin infections to life-threatening conditions. While it is known that about one-third of the general population's nares are colonized with *S. aureus*, reasons why some individuals carry *S. aureus* and others do not, have not been fully explained. Using a survey, this study investigated the differences in nasal carriage rates among various college students to determine if factors including gender, hospitalization in the past year, participation in contact sports, and other host factors were associated with staphylococcal colonization of nares. Staphylococcal colonization was determined by swabbing the nares of participating students and inoculating the samples onto Mannitol Salt Agar. Isolates were confirmed as *S. aureus* if they fermented mannitol, were gram positive cocci, and coagulase positive. Preliminary analysis indicated that students who were hospitalized in the past year are more frequently colonized with *S. aureus* than those not hospitalized. Male students and microbiology majors are more often colonized with *S. aureus* than female and non-majors respectively. Further analysis of the data is in progress.

An Investigation of a Unique Plaque Morphology Produced by a Halophage

Andrew Farr (Matthew Domek)

Poster Display 14
Microbiology
Gardner Undergraduate Research Scholarship

Halophages are viruses that infect salt loving bacteria (halophiles) that grow in the Great Salt Lake. The halophage JM01 produces a unique plaque morphology with several thin lines that expand outward that has not been previously described. We hypothesize that this unusual plaque morphology is due to either the motility of the host in combination with delayed entry of the virus into the host, or caused by a toxin that is synthesized when the phage enters the host. By filtering the phage suspension through a 100,000 molecular weight cutoff filter, we tested the retentate and filtrate for activity against the host. The retentate showed phage activity and the filtrate showed no effect on the host. Since there was no inhibition or clearing on the plate the presence of a toxin is highly unlikely. We are currently testing if motility plays a role in creating the unusual plaque morphology. The motility of the phage infected host will be tested by measuring its movement through a capillary tube.

Reconnaissance of Marysvale Volcanic Field, South Central Utah

Amanda Gentry (Jeffrey Eaton)

Poster Display 16
Geosciences
Denkers Undergraduate Research Scholarship

The High Plateaus region of southwestern Utah is important in understanding the present morphology as well as the Cenozoic history of the western margin of the United States. Crustal interaction between the ancient Farallon Plate and the North American plate produced substantial volcanism. The Marysvale volcanic field demonstrates lithologic units dominated by volcanic material and provides an example of this crustal interaction. The unit marking the onset of this volcanism is an unnamed, unstudied sandstone formed by an ancient river system. This basal unit requires further research which will be the focus of an undergraduate research project beginning in the summer of 2011. Paleocurrent measurements will be taken to determine ancient river flow directions, stratigraphic sections will be described in detail, and petrographic thin sections will be collected and prepared in order to study the rocks in detail. Radiometric dating will be used to date the unit, and the unit will be mapped to determine its distribution. These data should greatly enhance our understanding of the initiation of Marysvale volcanism of south central Utah during the Cenozoic.

Assessment of Stonefly Abundance and Body-Length Based on Rainbow Trout Abundance in Burch Creek, Ogden Utah

Seth Green, James Abbott (Christopher Hoagstrom)

Poster Display 17
Zoology

There is great interest within ecology regarding predator-prey and predator-predator (i.e., competitive) relationships in aquatic communities. Studies have shown that predaceous fishes may influence abundance or maximum size of predatory aquatic insects, such as stonefly larvae. We studied stonefly abundance and size in relation to rainbow trout abundance in Burch Creek, Ogden, Utah. Trout were collected with an electrofisher and stoneflies with a Surber sampler. We obtained stoneflies that represented three different families. In a previous local study, stoneflies of one of those families were more abundant with trout and those of another were less so, but we did not observe these relationships. The same previous study also found that stoneflies of one family reached a very large size in the absence of trout, but were relatively small with trout. We did not observe this relationship either. A third family of stoneflies, not studied previously, appeared to decline due to increasing abundance of trout. Overall, our data did not support previous findings regarding the influence of rainbow trout abundance on the abundance or average size of stoneflies from two families, but results for a third family did suggest the presence of an ecological interaction.

Validation of Mineral Chelates by Scanning Electron Microscopy

Robert Jensen, Aldolph Yonkee (Edward Walker)

Poster Display 18
Chemistry

Minerals often occur in nature as metal oxides or carbonates, which exhibit only limited solubility and are poorly absorbed from the digestive tract. To add value to minerals that are sold as dietary supplements, some manufacturers convert minerals from oxides into chelates. Such mineral chelates are composed of the metal ion and organic molecules which surround and bind to the mineral. This conversion process involves dissolution of the reactants in water, reaction, drying, and subsequent processing, all of which add cost to the final product. Some manufacturers skip this important step and simply mix dry chemicals in the supplement. However, dry-mixtures are not true chelates and should not be labeled as such. We have utilized Scanning Electron Microscopy (SEM) in conjunction with elemental X-ray emissions to map images of simple blends and mineral chelates. Our resulting data and images clearly show the difference between "dry mixes" and true chelates. Such SEM-XRF image mapping provides a powerful new tool in the validation of mineral chelates.

Molecular Analysis of Two Halophages Isolated from the Great Salt Lake

Preston Kerr, Jonas Peterson (Matthew Domek)

Poster Display 19
Microbiology
Nye Undergraduate Research Scholarship

Two halophages NS01 and CW02 were isolated from the Great Salt Lake. They were found to infect two different strains of *Salinivibrio costicola*. Previous studies have shown both halophages to have double stranded DNA genomes. Previous work also revealed that the genomes differed in their fragmentation patterns produced by restriction digest. They have similar icosahedral capsids. There is no information in the literature regarding either halophage. The DNA of each halophage was sequenced by pyrosequencing at BYU. Results revealed a single large contig for each virus. Bioinformatics techniques revealed a theoretical capsid protein, polymerase proteins, and a single tRNA in CW02. In addition, the structural and replication proteins seem to be encoded in separate reading frames. It is believed that isolation and analysis of the genome of NS01 will show similar organization. Evidence leads us to believe that the capsid proteins, as well as the polymerases and tRNAs will be similar in terms of both structure and composition.

Rainbow Trout Abundance and Habitat Conditions in Creeks Along the Wasatch Front

Zachariah Knight (Christopher Hoagstrom)

Poster Display 20
Zoology

Several creeks drain off the Wasatch Mountains in northern Utah. Water from these creeks allows a variety of life to flourish in the valley, but what about in the canyons upstream? Backpack electrofishing was conducted upstream of man-made structures in 28 creeks in canyons along the northern Wasatch Front. Nine creeks had rainbow trout. The length of each trout was recorded and habitat conditions were measured for comparison among creeks. Some creeks appeared superficially similar, but measurements showed trout populations and habitat conditions varied and habitat conditions appeared to affect trout populations. Some populations had higher abundance and included more recognizable length groups. Creeks with multiple length groups presumably support successful spawning more frequently (year to year) and larger populations suggest a greater carrying capacity. Larger, more diverse trout populations were associated with creeks having less silt, deeper water, and greater wetted width. These findings help determine conditions necessary to support trout and reveal potential of different types of creeks to support a specific type of trout population (such as one including larger fish). This information can also help determine which fishless creeks may be suitable for trout introductions.

Upper Atmospheric Particulate Monitoring and Sample Return

Alan Liddell (John Sohl)

Poster Display 21
Physics
Gardner Undergraduate Research Scholarship

H.A.R.B.O.R. (High Altitude Reconnaissance Balloon for Outreach and Research) is a student-run program in which high-altitude balloon systems are designed, constructed, and flown by students conducting individual or group research projects. These systems consist of commercially available weather balloons suspending several payload research capsules, containing data and image capturing equipment. The payloads are also designed to accommodate various experimental setups by students. A dust monitor sent on a flight last year recorded a significant pocket of dust in the upper atmosphere. I will be building, testing, and flying a particulate sample return system capable of sampling air at various altitudes up to the limit the balloon can reach (approx. 100,000 ft.), consisting of an original machined filter cartridge system and electronic circuit board designed by myself and Dr. Sohl. Once the sample return mission is completed in spring of 2011, I will take my samples into the school's SEM (scanning electron microscope) for spectroscopic analysis. This is a completely original and unprecedented project. My hypothesis is that the main cause of particulate matter in the upper atmosphere is due to local pollution. Post-flight analysis will determine whether my hypothesis is correct.

The Effect of Monomeric and Polymeric Diets on Growth and Development

William Mohn, Rainee Stevens (Brian Chung)

Poster Display 22
Zoology
Eccles Undergraduate Research Scholarship

While the mechanism behind dietary protein absorption is known, the balance between intestinal peptide and amino acid absorption is not fully understood. We hypothesized that the intestinal peptide transporter plays a pivotal role in growth. Similar to humans, the nematode *Caenorhabditis elegans* (*C.elegans*) absorbs dietary proteins through a combination of amino acid transporters and a discreet peptide transporter. Two strains of *C. elegans*: control (N2) and mutant (Null) lacking the peptide transporter were raised in either control medium with intact proteins (CON) or experimental medium of amino acids (EXP). Body length was measured for 5 days and analyzed using Multivariate ANOVA. N2 animals in CON reached adulthood ($\approx 900 \mu\text{m}$ body length) in 2 days however those in EXP did not reach adulthood until day 4. Null animals in CON and EXP reached adulthood by day 4 and 5, respectively. Regardless of strain, animals transferred from EXP to CON diet demonstrated improved growth, reaching adulthood at least 1 day earlier than those remaining in EXP. Absorption of peptides is therefore vital; sole reliance on dietary amino acids or loss of the intestinal peptide transport hinders normal growth. These data may help improve infant formulae and other nutritional support efforts.

Isolation and Characterization of Cellulytic Microorganisms from the Great Salt Lake, UT

Elizabeth Mora, Brian Bill (Craig Oberg and Michele Culumber)

Poster Display 23
Microbiology

With the need to develop alternative energy sources, including the degradation of cellulose to sugars for ethanol fermentation, identification of unique cellulytic enzymes may play a role in the development of this technology. The Great Salt Lake (GSL) provides a unique opportunity to isolate microorganisms and enzymes that may have a unique ability to utilize cellulose as their carbon source. Halophilic microorganisms from the Great Salt Lake were isolated based on their use of specific carbon sources of cellulose. Samples of water and sediment from the Great Salt Lake were inoculated into a halophilic minimal medium enriched with different cellulose sources including powdered cellulose, grass clippings, and newspaper. After 3 to 4 weeks of incubation, microorganisms were isolated from the enrichments on halophile agar plates enriched with the specific cellulose sources. After isolation, the 16SrRNA gene was amplified using PCR and sequenced. On all of the substrates *Halomonas*-like organisms were isolated. An *Idiomarina*-like organism was isolated from the grass clipping enrichment. The cellulytic activity of individual isolates was quantified using a carboxymethylcellulose-iodine cellulase assay. Several isolates exhibit moderate exo-cellulase activity.

Analysis of Dimethicone in Skin Protection Products by FTIR*Chase Naisbitt, Stuart Zuniga (Edward Walker)**Poster Display 24
Chemistry*

Dimethicone is a mixture of fully methylated linear siloxane polymers of various molecular weights. This water-insoluble material provides unique skin protection and lubrication when incorporated into skin care products. In fact, at concentrations of 1-30%, the US Food and Drug Administration allows certain skin protection drug claims as per 21CFR347. Hence, it is important to have dependable methods of analysis for dimethicone in a variety of different matrices. Current analytical methods required extensive sample preparation such as ashing and dissolution in acid prior to titration and are prone to experimental errors. We will present a new, rapid analytical method based upon Fourier Transform Infrared Spectrometry (FTIR), utilizing an attenuated total reflectance (ATR) cell to determine concentrations of dimethicone directly in skin lotions and creams, without any sample preparation. This simplified method minimizes sample preparation errors and offers accurate results across a wide range of concentrations.

Rapid Analysis of Zinc Oxide in Drug Products by X-ray Fluorescence*Brian Penman, Jazzi Sharifan, Trandon Bender, Kevin Larkin (Edward Walker)**Poster Display 25
Chemistry*

Zinc oxide is an active ingredient in a number of skin care products. Many of these products are registered with the FDA as Over-the-Counter drug products, thus requiring extensive routine quantitative testing of ZnO to insure quality and consistency. Currently, the most widely-utilized test method for ZnO is based upon an EDTA titration. To avoid interferences from the product matrix, samples are currently ignited and then dissolved in acid prior to titration. This cumbersome, time-intensive process is subject to errors introduced during sample preparation. Advances in X-ray fluorescence (XRF) technology have allowed this powerful analytical technique to be utilized in routine testing of creams and lotions with prescribed levels of zinc oxide. We have developed a simple, rapid analytical method that greatly simplifies ZnO analysis in such products, yielding results in less than one minute without the need for any sample preparation. We will report our procedure and present data demonstrating the advantages of this new method.

Biodegradation of Toluene by Halophilic Bacteria from the North Arm of the Great Salt Lake*Brice Peter, (Michele Culumber)**Poster Display 26
Microbiology*

The presence of toxic hydrocarbons is problematic in many environments including marine and halophilic ecosystems. There are examples of microorganisms that can degrade hydrocarbons in their native environments, especially if hydrocarbons are present naturally. Toluene is an aromatic hydrocarbon present in gasoline that is often present in the environment at high concentration when oil spills. Our hypothesis was that microorganisms from the Great Salt Lake (GSL) would be able to grow in the presence of toluene, even at high concentrations. We grew a halophilic bacterium (6S20), isolated from the north arm of the GSL, in the presence of 0mM, 0.37mM, 0.74mM, or 1.88mM toluene in either a standard halophile medium or a halophilic minimal medium. Both media were prepared with 20% NaCl. In the minimal medium, toluene served as the sole source of carbon. In the halophile broth, the organism grew at all concentrations, except 1.88mM toluene, indicating it could grow in the presence of toluene. Minimal media had no growth, however, this medium may not be able to support growth of this halophile without the presence of other growth factors. We are currently conducting experiments to determine if this organism can degrade toluene as a carbon source.

Use of X-ray Fluorescence for Quality Screening of Minerals Used in Dietary Supplements*Brandon Price, Firas Harb (Edward Walker)**Poster Display 27
Chemistry*

Manufacturers of dietary supplements are required by the FDA to verify that product ingredients match the manufacturers' claims. One commonly used instrument for verifying mineral content in dietary supplements is the Inductively Coupled Plasma Optical Emissions Spectrometer (ICP-OES). One tool that might be used to potentially increase efficiency and costs of testing samples is a portable X-ray fluorescence (XRF) instrument. A Thermo Niton Xlt XRF was used in this experiment to compare data to that of an Optima 2100 DV Perkin Elmer ICP-OES. Samples tested by the ICP-OES were also scanned with the portable XRF. The XRF used can effectively detect 10 of the elements most commonly used in dietary supplements. In addition to identifying elements the portable XRF can detect, a quantitative method for calcium was explored. The produced method showed results statistically comparable to the ICP-OES with a 95% confidence interval for concentrations of about 4-19%. Concentrations above this range no longer fit the generated calibration curve. It should also be noted that this method only applies to raw materials. Further restrictions include potential interelemental interferences from elements such as potassium and magnesium. It is recommended specific methods be explored for further elements.

**Habitat Ecology of Pygmy Rabbits
(*Brachylagus idahoensis*) in Northeastern Utah**

Jennifer M. Schmalz (Samuel Zeveloff and Barbara Wachoeki)

Poster Display 28
Zoology

The pygmy rabbit is the smallest rabbit in North America. A species of conservation concern, it has a limited distribution due to its dependence on big sagebrush (*Artemisia tridentata*) for food and shelter throughout the year. With accelerating habitat loss from development, understanding their ecology has become increasingly important. In 2010 with the Utah Division of Wildlife Resources, we studied the status of a pygmy rabbit population and its habitat requirements on U.S. Bureau of Land Management property in northeastern Utah. The presence of active burrows was determined by sightings of rabbits and signs such as fresh pellets. We subsequently compared 40 active burrow sites with 40 non-burrow sites. We examined the closest sagebrush plants to these sites to determine which of their features might be important to the rabbits in selecting a burrow location. The height, as well as the major and minor crown widths of the sagebrush, were highly significantly different ($P < 0.001$) when comparing the plants closest to burrow and non-burrow sites. The pygmy rabbits in this region prefer relatively large sagebrush plants for their burrows. The protection of areas with such sagebrush stands is apparently vital to the persistence of pygmy rabbit populations."

Novel *Marinobacter*-Like Organism and a Related Phage Isolated from the Great Salt Lake

Thomas B. Simon (Michele D. Culumber, Matthew J. Domek, and Craig J. Oberg)

Poster Display 29
Microbiology

The diversity of microorganisms of the Great Salt Lake (GSL) remains largely unexplored. The most easily cultivated bacteria from the lake belong to the γ -Proteobacteria genera *Salinivibrio*, *Idiomarina*, and *Halomonas*. We have found another organism related to the genus *Marinobacter*. A halophilic phage that infects this organism has also been found. Water samples from the GSL were diluted, plated on an oligotrophic halophilic medium, and incubated at 30°C for several weeks. A small, slow-growing, colony was selected. It was cultivated in broth medium, and identified based on its 16S rRNA gene sequence. Growth was optimum at 30°C and 8-12% NaCl. Phage were enriched by mixing filtered GSL water with the host, and then isolated using a soft-agar plaque assay. The phage formed 4-5 mm diameter plaques in 0.8% soft agar. Although *Marinobacter*-like organisms have not been specifically identified in the GSL previously, the presence of a specific bacteriophage for this isolate suggests the organism is relatively abundant in GSL water and may be vital to the GSL ecosystem. Other members of the *Marinobacter* are known to metabolize hydrocarbons, a process that may be important in the GSL.

Identification of *Wolbachia* Associated with Great Salt Lake Brine Flies

Amanda Truong (Jonathan Clark)

Poster Display 30
Zoology
Gardner Undergraduate Research Scholarship
NCUR 2011 Participant
WSUSA Undergraduate Research Travel Fellowship

Wolbachia is a genus of bacteria that live symbiotically within the cells of their host organisms. These bacteria are of interest because they have the unusual ability of affecting the reproductive processes of their hosts, manipulating the sex ratio towards females. These effects can include male killings, feminization of males, and parthenogenesis. Having more females in a population is beneficial to *Wolbachia* because they are inherited maternally. To date, at least ten different supergroups of *Wolbachia* have been identified, some of which correlate with the effect on the host. It is estimated that *Wolbachia* infect about 20% of all insect species, but their presence in many taxa has not been determined. In particular, there is no description to date of *Wolbachia* in organisms inhabiting extreme environments. The purpose of this study is to identify and characterize *Wolbachia* in Great Salt Lake brine flies, which are able to thrive in salinities that approach 20%. DNA was isolated from a number of species and the presence of *Wolbachia* was examined using the polymerase chain reaction with primers specific for *Wolbachia* 16S rRNA genes. Sequences were used to construct a phylogeny that identifies the supergroup to which the sampled *Wolbachia* belong. This study contributes to our understanding of *Wolbachia* diversification and may provide an indication of the precise effects these bacteria have on their brine fly hosts.

Inhibition of *Clostridium Difficile* by Lactic Acid Bacteria

Tarris Webber, Jed Lowe, Rachel Lowe (Craig Oberg)

Poster Display 31
Microbiology

Clostridium difficile is a spore-forming, gram-positive, anaerobic bacillus that produces two exotoxins: toxin A and toxin B. It accounts for 15-25% of all episodes of antibiotic-associated diarrhea. In 2004, a more virulent antibiotic-resistant strain was identified. This study was done to determine if lactic acid bacteria (LAB) used in dairy products have an inhibitory effect against *C. difficile*. With the difficulty of propagating *C. difficile* on solid media, 3 media types (sheep blood agar, sheep blood agar with oxyrase, and MRS agar) were tested. All LABs grew on the 3 media with *C. difficile* showing the most rapid growth on oxyrase-supplemented sheep blood agar. Sixteen LAB cultures were challenged with *C. difficile* using the agar flip technique. Incubation times had to be increased from 48 to 96 hours for observable results on the other 2 media. Of the 16 LAB strains used, 7 showed inhibition against *C. difficile*. Most inhibitory LABs belonged to the genus *Lactobacillus*. These results show that certain species of LAB can inhibit *C. difficile*. Since there was no direct contact between the two bacteria, inhibition may be due to secreted LAB metabolites including organic acids and bacteriocins. Results show that strains of LAB, perhaps delivered in fermented dairy products, have potential as a treatment for *C. difficile* infections.



College of Social and Behavioral Science

Advantages and Barriers in Counseling Services: A Survey of Weber State University Students

Ryan Cornelius, Melissa Meyer (Todd Baird)

*Oral Presentation
Psychology*

Weber State University has a pronounced team of mentors, teachers, and counselors at our disposal to deal with stressors, depression, and other various psychological problems. Multiple courses in stress management are taught every semester at Weber State University to teach students the necessary skills to deal with the expanding pressures placed on us. The counselors at Weber State University provide critical insight for helping distressed students. But the question remains is the average student able to take advantage of these privileges, and are there barriers preventing these students from seeking help? A random sample of 2500 Weber State University graduate and undergraduate students were asked to complete the Suicide Behavior Questionnaire-Revised, Impact of Events Scale-Revised, and several demographic items. Among other constructs these measures assess a student's suicide risk, perceived ability to intervene, and the impact suicide has had on university students. Demographic items are being used to predict at risk populations. The findings for each of the measures and demographic items will be presented.

The Embodied Representation of Spatial Language

Amanda-Jean Fochs (Aaron Ashley)

*Oral Presentation
Psychology
Nye Undergraduate Research Scholarship*

Research findings over the past few years have reshaped the way we think about mental representations. Empirical support has been accumulating for the idea that our perceptual/motor system and cognitions are linked. Results from a series of studies investigating the role of the perceptual/motor system in comprehension of spatial sentences suggest that language comprehension involves the same perceptual/motor systems as would be used when performing the actual task described. One question that remains unanswered is how we represent non-literal uses of spatial language. As figurative language comprises a significant proportion of our communication, and many of our figurative expressions are spatial in nature, answering this question could provide insight as to how we represent both non-literal and abstract concepts. The current research examined this question by having individuals judge the sensibility of sentences containing literal (e.g. The balloon is up in the air.) and non-literal (e.g. The decision is up in the air.) uses of vertical spatial terms. Participants made their judgments by pressing a button in an up or down direction with the direction of response and the implied direction of the sentence either matching or mismatching. Results will be discussed with a focus on theoretical implications.

The Effects of Twelve Hour Shifts on Performance in Pharmacy Personnel*Amy J. Friend (Lauren Fowler)**Poster Display 32
Psychology
2011 Posters on the Hill Participant*

Pharmacist medication errors cause an estimated 44,000-98,000 deaths each year in the United States, and these errors can cost up to 50 billion dollars annually (Gianutsos, 2008). The majority of medication errors are due to pharmacists and technicians having a high workload, working long hours, and experiencing fatigue. While working 12 hour shifts pharmacists experience extended exposure to work-related stress, sleep schedule inflexibility, and decreases in alertness and performance. This study was designed to assess under what conditions medication errors due to fatigue were most likely to occur in pharmacists and technicians working a 12-hour shift. Time of day, number of prescriptions, and number of shifts per week were areas of interest for possible error. Participants were tested every four hours throughout a twelve-hour shift for three shifts a week for two weeks. In each testing period participants were asked to complete four different tasks. Results revealed that time of day and the number of shifts that week did not have an effect on fatigue and errors. However the number of prescriptions that were filled did have an effect on perceived fatigue and cognitive performance. This research indicates that workload may be a likely predictor of when errors could occur.

An Analysis of the Effect of Caffeine on State-Dependent Memory*Alisa Garner (Aaron Ashley)**Poster Display 33
Psychology
NCUR 2011 Participant
Nye Undergraduate Research Scholarship*

Caffeine is widely known for its stimulating effects. Many studies have shown that caffeine increases cognitive performance on attention and memory tasks (Smith, Kendrick, and Maben, 1994; Warburton, 1995). State-dependent memory claims that events experienced in one state will be better remembered when the individual is in the original state. State-dependent effects have been found with many substances such as nicotine, alcohol, and caffeine (Goodwin, et al., 1969; Kelemen & Creeley, 2003; Peters & McGee, 1982; Weingartner & Faillace, 1971). Evidence for state-dependent memory has also been found when affective state is congruent at encoding and recall (Bartlett & Santrock, 1979; Bower, 1981; Lang, Craske, Brown, & Ghaneian, 2001). This research is an extension of past studies examining state-dependent memory. In the current study, both physiological-state and affective state were manipulated at times one and two in order to tease apart whether the state-dependent memory effect is better categorized via physiological or affective mechanisms. Initial mood was assessed followed by a Velten-like (1968) mood induction. Participants then completed a memory task while physiological measures were recorded. Participants returned 48 hours and followed the same procedure. Participants were then tested on their retention of the memory materials completed on day one.

The Effect of Task-Cueing on Optimal Decision Making: A Dual Process Account*Katelyn Peterson, Belia Alvarado, Branden Baldwin, Julia Cassidy, Ellen Hibdon, Justin Shepard, and Elizabeth Stewart (Eric Amsel)**Poster Display 34
Psychology*

The present study tested the task-cueing hypothesis (Inbar, Cone, & Gilovich, 2010) which holds that analytic thinking (logical, effortful, abstract, and systematic) and optimal decision making is promoted on tasks framed as objective, sequential, complex, and precise. A total of 322 college students were randomly assigned to complete four trials of the ratio-bias task in one of three conditions. In the task, participants choose between two equivalent gambles (e.g., 1/10 vs. 10/100) or expressed no preference and decided whether they would pay to select a preferred gamble. Participants in the Task Cueing condition completed a warm up task composed of 10 problems in which medical risks were computed and compared and then related to solving gambling risks. The No Cueing condition had no warm-up task and the Mathematics Cueing condition had a stripped down version of the 10 warm-up tasks presented as a fractions test. The hypothesis that metacognitive competence and optimal judgments would be made more frequently in the Task Cueing than the other conditions was only partially confirmed. The results were discussed in terms of dual process theory, with its assumption that task context effects may unconsciously promote analytic processing.

A History of the Swiss Chorus Edelweiss*Heather Plum (Kathryn MacKay)**Poster Display 35
History
Gardner Undergraduate Research Scholarship*

The purpose of my research project is to study the history of the Swiss Chorus Edelweiss based in Salt Lake City, Utah. My argument will be that the Chorus has played a major role in drawing Swiss people to Utah and in sustaining the vitality of the Swiss community. I am going to research why the Chorus was created and how it helps sustain the Swiss community in the Salt Lake valley. I also hope to place my research in the larger context of how folk music groups in general create and sustain an ethnic community. To reach this end I am going to research Swiss culture in general in order to obtain a better understanding of what the Swiss consider to be relevant. I will also research the history of Swiss migration to the United States and what drew them. I will continue by studying Swiss migration to Utah and particularly the Salt Lake valley. I will conclude by discussing the formation of the Chorus and its history up to the present. During the discussion I will explain how the Chorus has continued to draw and unite Swiss Americans in Salt Lake. As part of my research, I will conduct interviews with members of the Chorus.

Comorbidity of Substance Use and Depressive Symptomology: A Retrospective Analysis of their Relation and Trajectory across Adolescence

Amy Treveethan (Eric Amsel)

Poster Display 36

Psychology

Eccles Undergraduate Research Scholarship

There has been growing attention to the relation between developmental trajectories of substance use and affective disorders, primarily depression, during adolescence (Kaminer, Connor, & Curry, 2007). This developmental comorbidity has been explained in a variety of ways. The Primary-Secondary paradigm proposes that the primacy of the disease occurring first determines the prognosis of the secondary disease (Schuckit, & Monteiro, 1988). Self-Medication Theory assumes that substance use is a self-medication strategy for depression (Quitkin, Rifkin, Kaplan, & Klein, 1972). A third suspected reason is that they may be co-occurring through a third variable, such as stress (Degenhardt, Hall, & Lynskey, 2003). A retrospective assessment was used wherein participants (aged 18 - 22) recounted year-by-year the intensity of their substance use, stress, and depressive symptoms for ages 13 - 22. The interrelations and trajectories of participants' substance use, stress, and depression were analyzed to explore linear and nonlinear trends for whether the onset of a stressor is associated with nonlinear changes in intensity of substance use and depressive symptoms. The similar linear and non-linear trends found across stress symptoms, depressive symptoms, and substance use highlights the relation between these three variables in the comorbidity and developmental trajectories of these disorders across adolescence.

Priming Optimal Decision Making on a Gambling Task: A Developmental and Educational Study

Michael Young, Amy Treveethan (Eric Amsel)

Poster Display 37

Psychology

Previous research demonstrated that optimal decision making on a gambling task improved among college students who received a mathematics warm-up task compared to those who did not. The results suggested that the mathematics task subconsciously primed optimal decision making. The present study extends the previous one by examining the priming effect in a within-subjects design among younger middle school students, freshmen and sophomore college students and college juniors and seniors. Participants completed six trials of the ratio bias judgment task which assessed their tendency to express no preference between two equal gambles and resist paying for a preferred option. According to dual process theory (Amsel et al., 2008, 2009) such optimal responses requires that participants inhibit automatic and intuitive experimental cognitive processes and instead respond on the basis of effortful and systematic analytic cognitive processes. In the task, participants completed the same 18 item fractions task used in the previous research which was completed after the first three of the six trials of the ratio bias task. Results suggest that priming increased optimal responses but not participants' conscious cognitive strategies on the task, confirming the priming hypothesis.

