19TH ANNUAL

SWOSU

Research Scholarly Activity Fair

APRIL 10, 2012

MEMORIAL STUDENT UNION BALLROOM

12:00 - 3:00 P.M.

Nineteenth Annual
Student Research and Scholarly Activity Fair
Tuesday, April 10, 2012

Welcome,

The researchers, sponsors, and University Research and Scholarly Activity Committee appreciate your attendance at the Fair. Many hours have been committed toward these projects, representing a diverse array of disciplines across SWOSU. The University Research and Scholarly Activity Committee congratulate these participants for their efforts. We trust that you will have an enjoyable day.

I wish to extend my personal thanks to all who played a part in making this event happen, particularly to President Randy Beutler and Provost Blake Sonobe for their support for research and other scholarly activity at all levels throughout the University. Special thanks, also, to Dr. Lori Gwyn, Director of Sponsored Programs, and Ms. Berva Pool, Sponsored Programs Specialist, for their continuing efforts on behalf of the University Research and Scholarly Activity Committee. Thank you to Ms. Anjana Patel in the Website Management Department for her help in coordinating the online application process. Finally, to the members of the Committee, thank you for your dedication and hard work to make this event a reality.

Most of all, congratulations to all of the faculty, staff and administrative sponsors who dedicated significant time and effort toward integrating students into various areas of research and other forms of scholarly activity. The extra effort yields dividends for the future as students discover the excitement and fulfillment that research and scholarly pursuits can create.

Sincerely,

Dr. Jason Johnson, Chair
University Research and Scholarly Activity Committee

Committee Members

Dr. Randy Barnett	Dr. Denise Landrum-Geyer	Dr. Evette Meliza
Dr. Tami Moser	Mr. Jess Parker	Dr. Rahmat Talukder
Dr. Muatasem Ubeidat	Ms. Xiaomiao Wang	Dr. Lori Gwyn (Ex. Officio)

Title, Presenter, (Sponsor), Department, Abstract

1. **Paleontological Survey of Ordovician West Spring Creek Formation, Arbuckle Group, Kiowa County, OK.** Zella Classen (Dr. Brian Campbell) Department of Chemistry and Physics

   Oklahoma has a varied geological and paleontological history. There is still much to learn from the geologic exposures in this state. Numerous studies have been done with Mesozoic and Cenozoic paleontology and sedimentary geology, but many Paleozoic exposures have only cursory published studies, with most of these exposures having not been revisited for decades. We initiated a general paleobiological survey of the West Spring Creek formation (Ows), Arbuckle Group from the Ordovician Period, early Paleozoic Era. These exposures are dating from 443.7 – 488.3 Ma (+/- 1.5) and have little or no published research. This study employed a SWOSU student with an interest in invertebrate paleontology to assist with the cleaning of samples and identification of fauna. Several unpublished organisms and undescribed features from the Ows formation were identified. Identified organisms include: crinoids, brachiopods, gastropods, straight and coiled cephalopods. Identified mineral features include: pyrite crystals, limey sandstone, and chert nodules. We had anticipated finding pelecypods; unfortunately none were to be identified.

2. **Statistical Count of Invertebrata from Ordovician West Spring Creek Formation, Arbuckle Group, Kiowa County, OK**. Zella Classen (Dr. Brian Campbell) Department of Chemistry and Physics

   Several Ordovician (early Paleozoic) exposures dating from 443.7 – 488.3 Ma (+/- 1.5) with little or no published research were identified south of Mountain View, Oklahoma on hiway 115. This study surveyed the West Spring Creek formation (Ows) of the Arbuckle Group and performed an invertebrate identification and count, and environment interpretation. Twenty rock samples from this exposure were cleaned, cut, and analyzed for invertebrate fossils. Organisms including: brachiopods, cephalopods, foraminifera, gastropods, and crinoids were identified. Finding crinoid ossicles in the abundance we did was surprising, as little reference to them has been documented in the Ows. Trace fossils in the form of borrows, though uncommon, were identified in a few samples. Also surprising was the discovery of small pyrite crystals, fine limey sandstone, and chert nodules. Of the identified fossils, brachiopods and gastropods were the most common. From the fossils and matrix, we concluded the Ows was a shallow, warm marine environment, relatively high energy, with a limey mud substrate. Life was common, but not abundant. Many fossils found in the rocks likely lived in the area, but not the exact location they were found as signs of transport were evident. There were some indications of predation. In short, a limited, yet complex shallow photic marine ecosystem is indicated having existed between 444 and 488 Million years ago, just south of present day Mountain View, Oklahoma.

3. **Telegraphy**. Aaron Sunday, Matt Boyett, and Kyle Patterson (Mr. Jeff Short) Department of Industrial and Engineering Technology

   The Tom Stafford Air and Space Museum sought to have an interactive exhibit to teach the history of communication through telegraphy. Specifically, this research uses amplitude modulation to transmit and receive the short and long dashes of Morse Code generated by an oscillated keyer. A code wave key was designed and built to provide the input. The transmitters, receivers, CW keyer, and speakers were all assembled and integrated into a functional system under this project. This project will also provide documentation for maintenance and educational purposes, which will be given to the museum when the project is delivered.

4. **Birds of Flight**. Ryan Lawrence, Shaun Skinner, and Koby Sutton (Mr. Jeff Short) Department of Industrial and Engineering Technology

   The Thomas P. Stafford Museum sought an exhibit to simulate bird calls to create an active learning environment in the field of aeronautics. The research is to create a machine that relates a direct keypad input to a specific pre-recorded bird call. This will be made by an Arduino micro-processor with open source programming environment. The micro-processor then translates keypad inputs to different mp3 files stored on a removable memory source. The research will also provide instruction manuals and maintenance tasks.

5. **Astronomical Spectroscopy**. Wil Markus (Dr. Tony Stein and Dr. Wayne Trail) Department of Chemistry and Physics

   Spectra are our primary source of information about stars and other objects beyond the reach of spacecraft. Stellar spectra can be used to determine a star's temperature, atmospheric content, radial velocity, mass, and more. Recently, for example, spectroscopic techniques have been successful in finding extrasolar planets through Doppler shifts in stellar spectra. In the past year, I have acquired and analyzed portions of the spectra of a range of stars including types A (Vega, and Sirus), B (Rigel), G (Capella), K (Pollux and Arcturus), and M (Betelgeuse). I have also obtained spectra from the planets Jupiter and Saturn and am in the process of extracting the rotational velocity of the planets. I have made significant improvements to our astrophotography work, creating higher quality images than we have previously produced. Finally I have analyzed the magnitude of the supernova in nearby galaxy M101, which occurred in the August of 2011; my data agrees well with that of the national association of variable star observers. (This research was funded by a NASA grant through the Oklahoma Space Grant Consortium directed by Ms. Madeline Baugher.)

6. **Photographing Transient Luminous Events**. Michael Moore (Dr. Tony Stein) Department of Chemistry and Physics

   Powerful thunderstorms produce upper atmospheric optical phenomena known as Transient Luminous Events (TLEs). Our objective was to record these events from the ground. We used low-light cameras to photograph the atmosphere above thunderstorms after closely monitoring regional weather. We also continued building upon earlier research to measure the pulses of electric field produced by lightning using a capacitive electric field antenna. Here, we will discuss our results and lessons learned including photographs of TLEs and the building of lightning detection devices.

7. **Knowledge Engineer's Competitive Advantage in the Small to Medium Rural Companies**. Aaron Wilson, Jeff Crisp, and Adam Martin (Dr. Warren Moseley) Department of Accounting, Computer Science and Entrepreneurship

   Knowledge engineering has matured to the point that it is now possible for the tools and technology to be available to small to medium business, especially in the area of e-commerce. Knowledge Management and Knowledge Collaboration can now be designed specifically to organize, make accessible, and distribute an expert's or organization's proprietary know-how. As a sub-discipline of AI, knowledge engineering provides methods to capture and organize knowledge in a useful format accessible to non-experts. This Poster presents an example of the construction of a technology based marketing toolkit based on the integration of the criteria of excellence foundation found in the Malcolm Baldrige National Quality Critera and the simplicity of collaborative tools found in Web 2.0 to create an easy to use simple Knowledge Engineering Toolkit for Small to medium scale business. Not only is this applied to business settings but to small to medium school districts in Western Oklahoma. This is applied primarily to rural business and educational settings Rural Education. In addition, the results have the potential for supporting business functions related to web commerce, promotion,

training, and research, and development. In this project we created a Knowledge Support Company called Mol and Associates that brought this kind of service to Western Oklahoma Business and Schools. The collective expertise of an organization is its lifeblood. Employee education, training programs, new equipment, and computer upgrades are approaches commonly used to stem the technology tide. The success of these efforts depends heavily on attracting, motivating, and keeping valued employees. In today's acutely competitive job market employers are harder-pressed to find and keep people with high-level skills and experience. The void they leave behind can become a vacuum from which small and medium businesses may not quickly recover.

8. **Responsibility Driven Design Techniques for Networking and Parallelism in Computer Graphics and Animated Digital Storytelling.** Jesse Johnson (Dr. Warren Moseley) Department of Accounting, Computer Science and Entrepreneurship

   This project consisted of studying different hardware and software configurations for utilizing parallel and network configurations to produce high quality photorealistic pictures and animated sequences. This project produced a series of short animated clips and put the results into a consistent story. The current approach to animation and digital image sequencing parallels the activities found in the Software Life Cycle and the Software Processes of the late eighties and early nineties. It became evident in this time period that there was a need to apply proven Object Oriented Analysis and Design Techniques to support the generation of robust and repeatable Software Systems. This project demonstrated that the same cognitive functions found in the Object Oriented Software Development Process can be readily applied to the creation of digital storytelling and digital animation. Computer Animation and Digital Storytelling require time-intensive and space consuming algorithms to accomplish the task. Much of the current trends in animated films take enormous computational capability. Rendering is the process of generating an image through computer programs from a mathematical or graphical model that describes 3-D objects. Rendering is a computationally intensive process, and parallel processing is required to complete rendering jobs in reasonable time. We have installed, configured and evaluated some of the proprietary software and some of the available open source software in our Lab. We found several drawbacks in the implementation that have prevented us from running tests. We have been in close touch with faculty at the University of Oklahoma. We have been discussing various issues and requirements for using such software on their Supercomputers.

9. **Valuation of Diversity: What are the Predictors?** Heather Price (Dr. Jared Edwards) Department of Psychology

   Problem: We wanted to explore valuation of diversity among college students. How important is diversity to education? We considered possible factors, in addition to basic demographics, that could be related to valuation of diversity in education. We chose 3 variables that might have some relationship to valuation of diversity in education along with gender, race, and student status. We expected that student status might have an impact due to exposure to the educational system. We hypothesized that college would predict valuation of diversity because human service related majors are concentrated in 2 out of the 3 colleges at our university. We also hypothesized that higher levels of perceived career barriers as defined by Swanson (1995) would predict lower valuation of diversity in the educational process. Finally, we expected that home environment (rural vs. urban) might influence valuation of diversity.
   Discussion: Even with a relatively small final sample size, our hypotheses about perceived career barriers and college were supported. It is surprising that none of the demographic data had any main effects, but that may be a result of low power in our study. Future studies should examine more closely the relationship between College and Home Environment (rural vs. urban) on the Centrality to the College Experience score for attitudes about diversity.

10. **Abnormal Psychology: What Does a Typical Class Really Look Like?** Dana Clark and Lahcen Dallaly (Dr. Jared Edwards) Department of Psychology

    Problem: The goal of this study is to understand demographics of Abnormal Psychology classes nation-wide. It has been our experience that Abnormal Psychology tends to attract high numbers of non-psychology majors due to a general and vague interest in unusual human behavior, as discovered in a previous study (Clark & Edwards, 2011). The findings of this study were questioned at the 2011 annual meeting of the Southwestern Psychological Association. Searches through Psych Lit and Psych Info through the Ebsco Host search engine did not return any results matching this topic. Nothing matches this topic within the entire publication of the Teaching of Psychology Journal.
    Discussion: Even with thirty-two responses (n = 32), the class demographics are fairly consistent. Psychology majors versus non-Psychology Majors seem equally as common and the mean percentage is higher for non-Psychology Majors which makes the findings from the previous study (Clark & Edwards, 2011) applicable to other Abnormal Psychology classes with a higher non-Psychology major percentage.

11. **Music And Personality: How Artistic Are Musicians?** Lahcen Dallaly (Dr. Jared Edwards) Department of Psychology

    Problem: The goal of this study was to gain understanding of how personality components involved in career choices are related to musicians. According to Holland's theory of career personality, people and careers can be categorized by six different personality types (Spokane, Luchetta, & Richwine, 2002). While those with Artistic personalities focus on finding new, creative, and novel solutions to tasks, those with more Conventional personalities focus on organization and perfecting a system for completing tasks. Most assume that musicians are artistic. However, due to attention to detail, perfection, and focusing on playing a piece of music the same way each time, we hypothesized that some musicians would demonstrate interests more in line with Conventional personality.
    Instruments: Participants completed a demographic questionnaire, a questionnaire about their experiences as musicians, and the Self Directed Search (SDS, Holland, 1994). The music experience questionnaire asked participants to rate the importance of composing original pieces and performing existing pieces to their identity as musicians.
    Discussion: Comparing the qualitative data and the quantitative data raises an interesting question. Is the face validity of the SDS the reason for higher artistic scores on the SDS when some musicians qualitatively described their music in conventional terms? Another unanswered question is, even if performers are artistic, are they less artistic or more conventional than composers. These questions may be well addressed in future studies with more representation and power, but for now the conclusion is that, at least from a standardized assessment of career personality, musical performers report more artistic characteristics than conventional characteristics.

12. **Culture and Career Values: What Matters to Who?** Allison Stegman, Amanda Evans, Dayen Dooley, and Brenda Valencia (Dr. Jared Edwards) Department of Psychology

    Introduction: We were interested in a deeper understanding of career values. According to Person-Environment-Correspondence Theory (Dawis, 2002), career values are a major part of career choice and career satisfaction. Our question was whether there are clear demographic differences in what people value in relation to their career path. We sought an answer to that question by using Knowdell's (2005) Career Values Card Sort.
    Discussion: Having an idea of how men and women differ in what matters for career decisions can help career counselors in their work with clients. The main limitations of this study are low representation of non-European American individuals and over representation of freshmen. It is likely that there are differences in values for different racial and ethnic groups and that more life experience shifts priorities. Therefore, data here should be viewed as a starting point for discussions as opposed to a definitive statement about any individual client.

13. **The CBI-R And State Dependence: Do Recent Events Impact Scores?** Dayen Dooley, Amanda Evans, and Allison Stegman (Dr. Jared Edwards) Department of Psychology

    Discussion: The final results of this study strongly suggest that the Lack of Confidence Scale does not respond to trivial recent events. Additional studies with larger sample sizes and possibly other events should be utilized to confirm this. Future studies could also focus on more salient successes and failures along with possible questions of state dependence for other scales of the CBI-R. However, at this point evidence supports use of the CBI-R as a measure of more consistent trait conceptualization of barriers.
    Problem: The Career Barriers Inventory-Revised (Swanson, 1995) is an instrument designed to assess both real and perceived barriers to career development. We wanted to explore whether state dependence related to a recent success or failure would change the scores on the Lack of Confidence scale of the CBI-R.
    Methods: Participants. Participants were 52 undergraduates enrolled in general psychology at our university. The final sample was 55.8% male with a mean age of 19.79 years. The sample was 71.2% European American with no other racial or ethnic group accounting for 10% of the total.
    Instruments: Instruments for this study included a demographic questionnaire, the CBI-R (Swanson, 1995), and a standard checker board. The CBI-R is a 70 item, 7-point likert-scale questionnaire that yields scores for Sex Discrimination, Lack of Confidence, Multiple Role Conflict, Conflict Between Children and Career Demands, Racial Discrimination, Inadequate Preparation, Disapproval by Significant Others, Decision-Making Difficulties, Dissatisfaction with Career, Discouraged from Choosing Non-Traditional Careers, Disability/Health Concerns, Job Market Constraints, and Difficulties with Networking/Socialization: For this study only the Lack of Confidence score was utilized.

14. **College Self-Efficacy and Self-Defined College Success**. Elizabeth Lindamood, Melissa Taylor, and Crystal Gaylord (Dr. Jorie Edwards) Department of Psychology

    Problem: As part of a larger program evaluation project, this study evaluates perceptions of what it means to be successful in college (self-defined success), college self-efficacy levels, and the roles of academic motivation and engagement or involvement in attaining academic goals. Social-cognitive theory and career development theory stress the importance of self-evaluation and self-confidence (e.g., Bandura, 1986; Barry & Finney, 2009; Multon, Brown, & Lent, 1991). Motivation and personal values relate to the meaning ascribed to higher education (Henderson-King & Smith, 2006). Further, greater self-knowledge related to more effective academic planning (Wehmeyer et al., 2007). Therefore, it is hypothesized that students perceiving more academic motivation and engagement in academic activities will report increased levels of college confidence and proactive academic success behaviors and attitudes.
    Discussion: Potential benefits of this project involve exploration of academic development goals and perceived difficulties/benefits of accomplishing these goals, increased knowledge base of motivation and academic development, and use of and enhanced understanding of certain tenets of academic motivation and college confidence research. Having more knowledge about how students define a successful college experience provides the potential to tailor educational programming and services that can either help students advantageously adjust their goals and expectations or help university services, like freshman orientation courses, tutoring, and career services, to facilitate goal-directed incentives and improve retention efforts.

15. **Exploration of the Expectations and Roles of Psychology Tutors and Tutorees**. Melissa Taylor and Kayley Norman (Dr. Jorie Edwards) Department of Psychology

    Discussion: As an important aspect of program evaluation, having knowledge of need and expectations aids in the educational process of what tutoring does and does not involve and the effectiveness and efficiency of the tutoring program. For example, students, whether they participate or not, seem to want tutoring available that is respectful and organized with a variety of content examples. Further, access to resources ranging from the syllabus to old exams seems to contribute to the success of a tutoring program. This project is a stepping stone to larger exploration of academic development and goal attainment, retention efforts, and increased knowledge of academic resource utilization. Learning in the classroom is critical. Having additional resources to contribute to classroom success, such as tutoring, appears to also be vital for those who choose to utilize it.
    Problem: As part of program evaluation, this study serves as an initial needs assessment regarding reasoning for utilizing a tutor, student expectations of tutor and student, and the necessary resources that the tutor and the student should have available. Effective tutoring has been connected with improved test scores, less distress, and improved overall student satisfaction (e.g., Fantuzzo, et al., 1989; Helman & Horswill, 2002; Oley 1992). Having knowledge regarding academic expectations, attainment of academic success, along with information about perceptions of the various campus opportunities to aid in success enables more efficient program development for building a tutoring center within a psychology department.

16. **Media Portrayals and Perceptions of Mental Health**. Kayley Norman (Dr. Jorie Edwards) Department of Psychology

    Problem: As part of a larger project, this study focuses on attitudes generally held about mental health and perceptions about media depictions of those attitudes. Mass-media tends to present mental health information negatively, often inaccurately, and potentially perpetuates stigma (Orchowski etal., 2006; Wahl, 1995). Within the clinical profession there is a strong movement for more precise and person-centered terminology in effort to reduce stigma and increase awareness. From this, “mental illness” or “mentally ill” might not be adequate; whereas, broad encompassing terms like “mental health” or “those with mental health concerns” seem to be preferred. Therefore, this study explored potential differences of attitudes about “mental illness” and “mental health,” plus perceptions of media portrayals of mental health concerns/mental illness.
    Discussion: Although the profession recognizes important distinctions in utilizing more person-first language, it appears this custom has not yet occurred for this sample. The media-portrayals groups indicated more stigma-related attitudes being shown in media. Perhaps this is a recognition that media examples tend to go to extremes and that personal attitudes are less stigmatizing. However, results should be viewed cautiously because of potential demand characteristics and social desirability. Those in the media groups did not have to have a personal response and might be more likely to endorse more severe attitudes. Finally, connecting other research, increased knowledge about media’s role in reducing stigma and increasing accurate balanced information can lead to building better educational programming and to increasing hope and using effective mental health services.

17. **Media Portrayals Of The Cause And Treatment Of Mental Health Concerns**. Kateri Fletcher and Kayley Norman (Dr. Jorie Edwards) Department of Psychology

    Problem: Part of a larger project, this study focuses on potential overlap between one’s beliefs about etiology and treatment of mental health concerns and media presentations of these issues. Mass-media tends to present mental health information negatively, often inaccurately, and potentially perpetuates stigma (Orchowski etal., 2006; Wahl, 1995). Both public and professional opinion about origin and treatment varies greatly (e.g., Lauber et al., 2005; Samouilhan & Seabi, 2010). Reported beliefs about causes range from “genetics” to “weak will.” Attitudes about treatment options span from

medication and hospitalization to prayer to "no treatment." Therefore, this study explored various personal beliefs about cause and treatment, ranked importance of those beliefs, plus perceptions of how common these issues are indicated in media.
Discussion: There seems to be a matching pattern regarding top beliefs and top portrayals in media regarding cause and treatment of mental health concerns. The major drawback of this study is lack of determination of a causal connection and if there are other mitigating forces affecting both these factors. However, increased knowledge about generally held beliefs about mental health and media's role in reducing stigma and increasing accurate balanced information can lead to building better educational programming and increasing hope and using effective mental health services.

18. **Are Readers More Curious Than Not Readers?** Megan Alspach and Quinlan de Windt (Dr. Stephen Burgess) Department of Psychology

Problem: Individuals who read more tend to have larger vocabularies, score higher on achievement tests, and be more knowledgeable about world events (Cunningham & Stanovich, 2001). It is possible that part of the relation to higher cognitive outcomes is that readers are more curious on average than those who do not read. Curiosity is broadly defined as a desire for acquiring new knowledge and new sensory experience that motivates exploratory behavior (Litman & Speilberger, 2003). Very little is known about curiosity and its relation to information seeking behaviors such as reading. Epistemic curiosity (EC) reflects a desire for new information that motivates behaviors that explore and seek out knowledge (Berlyne, 1954). The purpose of epistemic curiosity is to motivate exploration to resolve discrepancies in one's knowledge (Litman et al., 2005). Perceptual curiosity (PC) refers to the increased perception of stimuli (Berlyne, 1954). We hypothesized that readers would be score higher on a test of EC than not readers. We hypothesized that not readers would score higher on a test of PC.
Discussion: We explored the relation of reading status to measures of EC and PC. Readers demonstrated a greater intellectual curiosity as indicated by higher scores on the EC measure. There were no differences in perceptual curiosity between the groups. Future research is needed to explore differences in other information seeking behaviors between readers and not readers.

19. **Literacy Behaviors, Likes, And Perceptions Of Readers/Not Readers: Replication And Extension**. Quinlan de Windt and Megan Alspach (Dr. Stephen Burgess) Department of Psychology

Problem: Those who read more tend to have larger vocabularies, demonstrate higher academic achievement and know more about the world (Cunningham & Stanovich, 2001). Unfortunately, reading behavior tends to decrease from early childhood throughout the teen years (e.g., Mohe et al., 2000). The incidence of reading behaviors among young adults has not been adequately studied (Chen, 2008). The popularity of the internet mobile devices has made literacy resources more accessible than ever. It is possible that the use of literacy resources is changing as a result. Readers are those who choose to read whereas not readers are those who can read but choose not to read (Burgess & Jones, 2010). The present study is designed to assess the different reading behaviors or readers and not readers related to academic versus other sources of print. We also examined how readers vs not readers perceive each other.
Conclusions: The accessibility of print resources has increased dramatically. We examined differences in the literacy behaviors of self-classified readers and not readers. We found that readers reported enjoying and engaging in more leisure literacy behaviors (e.g., reading books) than not readers. However, the use of literacy materials for information seeking and school related purposes was not different between the two groups. Readers and not readers also did not differ in their description of the reasons for what makes someone a reader or a not reader. The implications for how literacy behaviors and definitions are studied will be discussed.

20. **Readers and Not Readers: A Qualitative Study of Reader Status**. Crystal Gaylord (Dr. Stephen Burgess) Department of Psychology

Importance of Problem: Reading is associated with a variety of higher mental processes (Martin-Chang & Gould, 2008). Unfortunately, time spent reading declines with age such that teens read less than middle schoolers who read less than elementary students (Viadero, 1993). Strommen and Mates (2004) interviewed sixth through ninth grade students to identify factors associated with the enjoyment of reading. They found readers (those who engaged in reading for pleasure and as a regular activity) versus not readers (those who can read but choose not to engage in reading behaviors regularly or for pleasure) reported interacting around books with their social circle who also enjoyed reading, that being an active part of a community of readers was an important part of their identify, and that it was important to them to read every day. Not readers did not see reading as important to themselves or their friends and saw the value of reading for success in school but not as a pleasurable activity. We extended the Strommen and Mates (2004) study to examine the attitudes of adult readers and not readers. For this qualitative study, we conducted a series of interviews with college students.
Conclusions: Our qualitative investigation of readers and not readers suggests that adults may identify differently with literacy than younger individuals. Results will be discussed in terms of the implications for literacy use by college students for school and learning activities.

21. **Health Promotions or Just the "Boob Tube?": A Content Analysis of Commercials**. Ashley Murray (Dr. Melinda Burgess) Department of Psychology

Introduction: In the United States the number one killer of women is heart disease, whereas we see more commercials and campaigning for breast cancer. With increased campaigning and advertising for awareness for breast cancer, we sought to answer: what is portrayed in breast cancer versus heart disease television commercials aired in the United States?
Discussion: This study was the first to compare the content of health television commercials. The findings that HD commercials were more likely to portray disease and death statistics than breast cancer suggest that scare tactics are more often used in HD commercials. The findings that BC commercials were more likely to portray women as "sexy," and more likely to physically objectify women suggests that the advertisement of breast cancer is another chance to objectively portray women, as opposed to women portrayed in HD commercials which never used "sexy" or objectified imagery. It is important to investigate whether sexualized media, such as the sexualized images used in BC commercials, increases fear of being diagnosed with BC in women, and whether these awareness campaigns increase knowledge about the disease.

22. **Do Sexy Advertisements Increase Fears Of Breast Cancer In Young Women?** Ashley Murray (Dr. Melinda Burgess) Department of Psychology

Introduction: This study examined whether the sexualized imagery of women so frequently found in everyday mainstream media impacted young women's perceptions of health risks. Specifically, we were curious as to whether this sexualization increased women's fears of breast cancer.
Discussion: This is the first work of its kind to investigate how sexuality in advertising influences young women's health concerns. While our results did not support our hypothesis that the hypersexualized images would increase women's fears of breast cancer, there are few things to consider. First, fear of breast cancer was fairly high, overall, in our sample. It is possible that we simply have ceiling effects and fear of breast cancer cannot increase significantly more. Second, we included a number of health conditions in our surveys to decrease the obviousness of what we were investigating. Quite unexpectedly, the sexualization condition reported significant concerns about contracting HIV (one of the supposed distractor conditions). Future research should re-examine this issue with these two concerns accounted for.

23. **A Content Analysis Of Rap, Country And Rock Lyrics**. Kateri Fletcher and Gina Morris (Dr. Melinda Burgess) Department of Psychology

    Introduction: The musical genre commonly referred to as rap (or hip-hop) is currently at its height of popularity among young adults. However, these listeners also believe that rap uses more negative words for women, as compared to rock or country, references drug / alcohol use and sex more, and is less likely than country to mention love (Cowick & Burgess, 2011). We were curious to see if these perceptions were accurate. We conducted a content analysis on the top 25 songs for each genre, rap (hip-hop), country and rock from the Billboard® week of October 1, 2011.
    Discussion: The results of this content analysis were, frankly, a surprise. Previous research has shown that people believe rap music to be significantly more sexist and negative overall than either rock or country. Yet, Jhally (2007) has shown that music videos know no genre boundaries in terms of their misogynistic and degraded portrayal of women. As such, we expected all the genres to be equally negative in regards to the descriptions of women and sexuality. Our content analysis reveals that among the bestselling 25 songs of each genre, while rap was more likely to use negative terms for women, they were no more likely to mention sex, or alcohol and drug use; rap was also just as likely as country, perceived as the most woman friendly genre (Cowick & Burgess, 2011) to use positive words for women. Future work needs to examine the music videos more closely. It is possible that while the lyrics are all relatively mild, the imagery is not.

24. **Leadership Traits**. Sukriti Aryal (Dr. Hank Ramsey) Department of Finance, Management, and Marketing

    This presentation defines leadership characteristics and discusses various approaches to Leadership. In addition, reveals common leadership characteristics as well as distinctive characteristics shared by several leaders from history. Leadership is powerful tool consisting of individual qualities such as Dominant, Contentious, Dauntless, and conscientious.

25. **The Western Oklahoma Tuberculosis Sanatorium Cemetery Restoration Project**. Dr. Kelley Logan, Department of Language and Literature

    Primarily a repository for the dead, a cemetery is so much more. Many contain works of art; most reflect the religious and spiritual thought of the region in which they are place. But all cemeteries represent the history of the nation, state, and families whose members are interred there. As such, cemeteries and those buried there should always be afforded dignity. This is doubly true for those buried at the WOTBS cemetery in Clinton, Oklahoma. For this cemetery and those interred there are a lasting reminder of a time of medical advancement and personal loss. This cemetery as it now exists cannot contribute as a cemetery is meant to as a place of reflection and study. It is now little more than a well mown field – only one grave is visible; all others have sunken below grade through years of rain and sand shifting over the modest cement and metal markers. This subsidence effectively makes those buried there anonymous, stripping the dignity from them that they would have been afforded at any public cemetery. Restoring their markers to grade where the buried could be accounted for and mapped would be an acknowledgment of their personal struggle with a frightful disease, reclamation of family history of those who lost loved ones and a documentation of Oklahoma's struggle with the White Plague and to give fitting treatment to her sons and daughters during their struggle, a documentation of a part of Oklahoma history that is an integral part of the Western Oklahoma spirit. Finally, it would ensure a fitting rest for those who lost the battle.

26. **Improvement Of The Contemporary Canopy Design**. Linjun Chen (Ms. Xiaomiao Wang) Department of Art

    Canopy, one of the important architecture components, can be used for blocking rain and sunlight, and as emergency fire escape stair. Today, the appearance of canopy tends to be simple and minimal. Instead of using traditional materials, such as stone and wood, canopy usually is made of glass and steel to match the style of contemporary architecture and modern metropolis. The new materials are strong and inexpensive, and can be easily constructed. However, design of canopy tends monotonous, and dirt and dust can be easily seen on transparent materials, which greatly affect appearance. For a building, canopy embraces people as a greeting hand, and makes the first impression. Therefore, I explored several design plans of canopy to meet its functionalities, and visual artistic needs.

27. **Using Neurologic Music Therapy Techniques to Treat Children with Autism-A Pilot Study.** Elizabeth Sommerfeld (Dr. Sophia Lee) Department of Music

    Autism is characterized by having delays or abnormal functioning is one of the following areas, with onset prior to age 3 years: social interaction, language as used in social interaction, and symbolic or imaginative play. To help children cope with this disorder there are many different therapies offered. Neurologic music therapy deals with cognitive, motor dysfunctions, and sensory problems due to neurological disease; this is based on music perception and production and the influence of music on functional changes in nonmusical brain and behavior functions.

28. **Physician support on the referral for Music Therapy Assisted Childbirth**. Amanda King (Dr. Sophia Lee) Department of Music

    This study reports a survey study on OB/GYN's in the metro areas of Oklahoma City and Tulsa to determine what factors would influence the physician's decision to refer patients to this advancing new technique. These identified factors help further educate physicians and promote the benefits of music therapy in assisting childbirth process.

29. **Music Therapy Assisted Exercise: Key to Reduce Falls among Older Adults**. Jorja Hammond (Dr. Sophia Lee) Department of Music

    The study investigates the effectiveness of music therapy and exercise in the reduction of falls among older adults. A 6 week music therapy assisted exercise program is to be administrated at assisted living centers of Western Oklahoma and the results on the frequency of falls among the participants are analyzed. The presentation will be concluded with suggestions for further studies.

30. **Evaluation Of Pharmacists' View On Pharmacogenomics In Various Types Of Practice Setting**. Danny Tran (Dr. Jaehwa Choi and Dr. Nina Morris) College of Pharmacy

    Great emphasis has been placed on pharmacogenomics to achieve personalized medicine in the post-genomic era. The goal of the current study was to assess pharmacists' views on incorporating pharmacogenomics into their various types of practice settings. An online survey was sent to active pharmacist preceptors (n > 600) on the SWOSU COP Experiential Database. Data were collected in Excel format and further analyzed using SigmaPlot. The survey results showing the demographic of the respondents are as follows: 16% earned their pharmacy degrees within the last 5 years, 33% earned degrees 6-10 years ago, 22% earned degrees 11-20 years ago, and 25% earned their degrees over 20 years ago. Forty-four percent of these respondents practice at an institutional setting, 40% practice at community settings, and 16% practice at other settings such as mail order and federal facilities. The respondents also answered survey questions about pharmacists' role in pharmacogenomics. Sixty percent agree that healthcare providers should ask pharmacists for recommendations

regarding therapy changes for previously performed pharmacogenomics testing. Only 13% disagree that pharmacists should recommend pharmacogenomics testing within their clinical practices and only 7% disagree that healthcare providers should ask pharmacists for recommendations on appropriate use of pharmacogenomics testing. These results show that pharmacists in all practice settings agree pharmacogenomics should be an important part of their practice. Our survey results indicate that there is great enthusiasm among pharmacists to apply pharmacogenomics to their practice, regardless of their practice setting.

31. **Current Status Of Pharmacogenomics Education Among Practicing Pharmacists.** Craig Chapman and Robyn Dowdy (Dr. Jaehwa Choi and Dr. Nina Morris) Department of Pharmaceutical Sciences

    Great emphasis is placed on pharmacogenomics to achieve personalized medicine in the post-genomic era. The goal of the current study was to assess practicing pharmacists' educational background and perceived knowledge base of pharmacogenomics. An online survey was sent to active pharmacist preceptors (n > 600) on the SWOSU COP Experiential Database. Data were collected in Excel format and further analyzed using SigmaPlot. Demographics of the survey respondents showed even distributions in their pharmacy experience and practice setting. Only 10% of respondents had pharmacogenomics education in formal pharmacy courses and 78% had no experience with pharmacogenomics in their continuing education. Most respondents (81%) agreed that pharmacists should have some knowledge of pharmacogenomics. Moreover, 57% agreed and 6% strongly agreed that pharmacists should be able to provide recommendations for therapy changes based on prior pharmacogenomics testing. However, only 26% agreed and 5% strongly agreed that they could identify reliable sources of information regarding pharmacogenomics. Those who had received recent continuing education in pharmacogenomics not only agreed to a significantly greater extent with the premise that pharmacists should be able to recommend appropriate therapy changes but also displayed greater confidence in their ability to do so ($P < 0.001$, Mann-Whitney test). Our survey results indicate that there is a great need to develop educational materials for practicing pharmacists and in addition, devise an effective means to disseminate this information in order to facilitate the effective application of pharmacogenomics principles by pharmacists.

32. **Inhibition Of JMJD2 Histone Demethylase By Curcumin Analogs**. John Thompson (Dr. Jaewha Choi and Dr. Carroll Ramos) Department of Pharmaceutical Sciences

    Epigenetic abnormalities have been implicated as of equal importance to genetic mutations in the initiation and progression of cancer. Epigenetic mechanisms include changes in chromosomes through post-translational modification of histones. The jumonji-domain (JMJD)-containing proteins are a family of histone demethylases. The JMJD2 genes appear to be proto-oncogenes as these genes are frequently found to be amplified in various types of cancer. Therefore, inhibition of JMJD2 function potentially is a promising target for anticancer therapeutics. The current study focuses on the identification of curcumin analogs that show inhibition of both histone demethylase activity and cancer cell proliferation. The ability of each curcumin analog to inhibit the activity of the JMJD proteins was assessed by measuring the methylation level of histone substrates through Western blotting using antibodies to trimethylated histone. The ability of the curcumin analogs to inhibit cell proliferation was measured using 3-(4,5-dimethylthiazol-2-yl)-2,5-diphenyltetrazolium bromide (MTT). Several curcumin analogs showed inhibitory action towards histone demethylation by JMJD2A. These curcumin analogs also inhibited proliferation of several cancer cells, including colon cancer cells (EC50 = 2-6 μM). These data support our previous finding that JMJD2A is a novel promoter of colon cancer cell proliferation. In conclusion, we have identified several curcumin analogs that both have anticancer activity and inhibit histone demethylation.

33. **Dissolution Rates Enhancement of Raloxifene Using Binary PEG Mixtures**. Kara Connelly (Dr. Rahmat Talukder) Department of Pharmaceutical Sciences

Purpose: The aim of this study is to enhance the dissolution rates of raloxifene by developing solid dispersions using a mixture of polyethylene glycols.
Methods: Two granulation methods were used. In melt method PEG 8000 was melted at 70ºC and the drug or drug-surfactant (SLS) mixture was added and mixed well with molten PEG. The dispersions were rapidly cooled and refrigerated. In the solvent method, solutions of the PEG-drug or PEG-drug-surfactant mixtures were made in chloroform, then dried and refrigerated for further processing. Solid state characterization and dissolution studies of the granules were done.
Results: Thermograms of raloxifene showed an endothermic event related to the loss of crystallization upon decomposition at approximately 260°C. PEG 8000 showed a melting peak at 55.6º, which did not change in the presence of SLS. The dispersions showed minor endothermic event around 250º, but the melting peak of PEG was lowered to 53.8. These changes in thermograms are attributed to the fact that raloxifene might have dissolved and partially lost its crystallinity in melted PEG. FTIR spectroscopy study of raloxifene and PEG showed a new absorption peak, which may be attributed to the attachment of hydroxyl group of PEG to amine group of raloxifene. The dissolution profiles showed that in 60 minutes, when the drug alone was used, only 20% went into solution, while that was increased to about 50% from raloxifene-PEG dispersion at a ratio of 1:1.
Conclusion: Solid dispersions with PEG enhance dissolution rates of raloxifene. Mechanistically it appears that PEG molecules form conjugates with raloxifene, which increases the dissolution rates of raloxifene.

34. **Side Effects of Coffee Consumption Among SWOSU College Students**. Angelina Anaya and Tien Huynh (Dr. Lisa Appeddu) School of Allied Health

University students drink coffee for many different reasons – such as to wake up to get to class. However, coffee consumption can cause side effects. Therefore, the objectives of our research were (1) to determine the coffee consumption habits of college students, and (2) to evaluate the benefits and side effects experienced by college students after consuming coffee. A survey was conducted using convenience sampling of 95 students from Southwestern Oklahoma State University (SWOSU) in Fall 2011. This project was done to meet Health Statistics course requirements, and funding was provided by a SWOSU Organized Research Grant. The majority of students surveyed (62%) drink coffee on a regular basis. Although 76% started drinking coffee prior to college, only 24% of subjects reported to consume coffee more than once a day. Primary sources of coffee included the SWOSU Bulldog Beanery (49%) and home (36%). Most drank caffeinated (61%) and specialty (34%) coffees. The majority of students (50.8%) listed a combination of benefits as to why they consume coffee – these included to wake up, get energy, warm up, fill a habit, enjoy the taste /find it refreshing, put in a better mood, and for cultural fulfillment. The majority of students (64.4%) did not experience negative side effects of coffee consumption. The top three side effects included increased urination, jitters, and a combination of these. Only four students reported GI tract upset and one student reported migraines. Overall, 98% of subjects who consumed coffee reported feeling at least okay after consuming coffee, suggesting the benefits of coffee consumption outweighed the side effects in college students.

35. **Leukemia Awareness**. Carissa Curtis and Amber Jaiman (Dr. Lisa Appeddu) School of Allied Health

Leukemia is a type of cancer that affects the bone marrow, resulting in the production of abnormal blood cells. It can affect both adults and children. Therefore, the objectives of our research were to evaluate the knowledge level of leukemia in (1) SWOSU students and the general Weatherford population, (2) in subjects who have friends or family members with leukemia, and (3) in subjects who have participated in cancer fundraising events. A survey was conducted using convenience sampling of 48 students from Southwestern Oklahoma State University (SWOSU) and 31 non-students in Weatherford, OK, in Fall 2011. This project was done to meet Health Statistics course requirements, and funding was provided by a SWOSU Organized Research Grant. Questions testing knowledge about leukemia included recognition of symptoms, risk factors, common types, and treatments. An informational sheet about leukemia was provided to participants after completion of the survey. Results suggest the knowledge level of leukemia in students (56%) was similar to that of non-students (48%). Three students and 13 non-students had friends or family members with leukemia; a similar proportion of these subjects (50%) were found to be knowledgeable about leukemia as compared to those who did not know anyone with leukemia (43%). The majority of subjects (65% and 74% of students and non-students, respectively) had participated in cancer fundraising events; they had a similar amount of knowledge about leukemia (52 versus 57%, respectively). However, among non-participants, a higher proportion of students (71%) were knowledgeable about leukemia than non-students (25%). Results suggest more can be done to educate both students and the general population about leukemia.

36. **Identification of Microbes Isolated from Bovine Quarters over Lactation**. Hilda Rodriguez (Dr. Lisa Appeddu[1] and Dr. Michael Brown[2]) School of Allied Health, Southwestern OK State University[1]; USDA-ARS-Grazinglands Research Lab[2]

The objectives of this research are to compare the incidence and types of intrammammary infections in different cow breeds across lactation, and to evaluate level of antibiotic resistance. This research is the last year of an on-going project between Southwestern Oklahoma State University (SWOSU) and the USDA-ARS Grazinglands Research Laboratory in El Reno, OK. It is funded by a SWOSU College of Professional and Graduate Studies Faculty Research Grant. Milk samples (10 ml) were aseptically collected in duplicate from the individual quarters of forty beef cows in early (May), middle (July), and late (September) lactation in 2011. Samples (10 µl) were plated on blood agar to detect and isolate microbes present. Identification of microbes is currently being done by staining for Gram reaction, observing culture appearance on differential and selective media, running catalase and oxidase tests, determining coagulase reaction, and utilizing commercial kits to identify species. Microbes will be screened for susceptibility to antibiotics by use of a disk diffusion assay. Antibiotics to be tested include those used in veterinary and human medicine, as well as to test for Methicillin-Resistant Staphyloccus aureus (MRSA). Results indicate intrammary infection rates increased over lactation in 2011, with 19, 35, and 40% of cows harboring microbes in at least one quarter in early, middle, and late lactation, respectively. Preliminary identification suggests infective microbes were different species of Corynebacterium, Streptococcus, and Staphylococcus. Overall, this research will be used to evaluate the incidence of microbial infection and effectiveness of antibiotic treatments in a cross-bred beef cow herd in Oklahoma.

37. **Meniscal Injury and Repair**. Lindsey Roberts (Ms. Jessica Young) School of Allied Health: Athletic Training Program

Shultz, S. J., Houglum, P. A., & Perrin, D. H. (2010). Examination of musculoskeletal injuries. Pittsburgh, Pennsylvania.

Aros, B. C., Pedroza, A., & Vasiledd, W. K. (2010). Knee Surg Sports Traumatol Arthrosc. Mechanical comparison of meniscal repair devics with mattress sutre devises in vitro, 1594-1598.

Starkey, C., Brown, S. D., & Ryan, J. (2010). Examination of Orthopedic and Athletic Injuries. Philadelphia, PA: F.A. Davis Company.

INTRODUCTION: The meniscus is two "C" shaped disks, within the knee, to allow for smooth gliding of the femoral condyles to glide. A tear to the meniscus means surgical repair is needed. Some surgeries to fix tears of the Meniscus are the FasT-Fix, MaxFire, RapidLoc, etc. However, these surgeries may not withstand the possibilities of everyday life or the athletic side of injuries.
METHODS: One study tested loading force on menisci that were collected from old bovine knees that had no damage to them. When tested they were frozen for keep and then thawed. Then, they were split into even groups and an incision was place in the middle, giving them all different sutures. All of the menisci were put into a testing system to allow for a loading force, which some failed.
RESULTS: With the tests that were used, Fiberwire VM was stronger and MaxFire HM was the weakest. Some failures of testing were also observed in all the tests. One would be that the suture was not placed correctly making the suture weak.
DISCUSSION: The most important idea of this study was to test the ability of the different sutures to withstand a greater loading force to secure the meniscus together. This study also allows us to see different suture techniques on meniscus for the best results.

38. **Biodex: The Future of Athletic Training**. Shelby Burk, Kayla Moore, Chelsea Crown, and Natasha Dowdy (Ms. Jessica Young) School of Allied Health: Athletic Training Program

The Biodex machine is a tool that can be used to assess and treat balance problems. Through a series of tests, the technology can help the therapist determine which of the three body systems (vestibular, visual, and somatosensory) are responsible for balance control is contributing to the patient's balance issues (Arista Care). The Biodex is used by physiotherapists as not only a diagnostic tool but also as a rehabilitation tool. The machine measures power and endurance in different muscle groups. It compares limbs in individuals to the opposite side and to normative data. It can be used for isometric, isotonic or isokinetic exercises if there is a deficiency found in the muscles (Sports Injury Surgery). The rehabilitation can help prevent many aches and pains related to sports and activities. This machine is also useful in treating repetitive strain injuries and recurrent injuries that seem to never fully heal (Sports and Exercise Medicine Institute). The Biodex particularly works well in identifying muscle group weakness which is not easily assessed on clinical examination (Sports Injury Surgery). The Biodex can also be used to improve pre-season conditioning and training. These findings are used to enhance pre-season conditioning, better preparing the athlete for competition. A Biodex assessment includes graphs and charts with findings that indicate the athlete's strengths and weaknesses (Sports and Exercise Medicine Institute). All of theses factors can benefit us as future athletic trainers. It is a relatively new technology and we are learning more about it each day. We would like to spread our knowledge so that we can benefit other people's lives, not just our athletes.

39. **The Role Of Lanthionine Ketamine (LK), A CRMP2 Ligand,In Mediating Learning And Memory**. Caleb Hubbard, and Tyler McLemore (Dr. Andrea Holgado[1] and Dr. Kenneth Hensley[2]) Department of Biological Sciences, Southwestern OK State University[1]; Department of Pathology, University of Toledo, Ohio[2]

Mammalian CRMP2 and the C. elegans homolog UNC-33 are multifaceted protein families involved in a variety of normal cellular functions such as synaptic remodeling and plasticity; synaptic vesicle trafficking and neurotransmitter release; and cytoskeletal dynamics. CRMP2 has also been associated with neuropathological disorders. For instance, CRMP2 expression levels are decreased in brains of Alzheimer's patients; overexpression of CRMP2 accelerates nerve regeneration in injured rats; the anticonvulsive drug lacosamide works by binding to CRMP2. Thus, based on these observations, we hypothesize that CRMP2 expression plays an important role in the brain physiology in health and disease. Furthermore, we reasoned that many neurodegenerative disorders would be slowed or reversed if CRMP2 expression was targeted therapeutically. In likewise fashion, our study focused on the in vivo effects of Lanthionine ketamine (LK), a CRMP2 ligand, in synaptic plasticity dependent behaviors such as learning and memory. In brief, C. elegans nematodes were grown in the presence of the cell permeable LK-ester (LKE) at both 0.5mM and 0.0mM concentrations. After 96 h treatment, animals were conditioned to butanone and memory was tested both immediately after (short-term) and 16 hours after (long-term) the initial conditioning. Results show animals grown in the presence of LKE to have improved short-term and long term memory. To summarize, studies using the genetic model organism C. elegans reiterate the importance of using CRMP2/UNC-33 as a target for new drug developments and point-out that LK may chemically enhance CRMP2 function in vivo.

40. **Collapsin Response Mediator Protein-2 (CRMP2/UNC-33): An Emerging Target Of New Drugs For Alzheimer's And Other Brain Diseases.** Sean O'Brien, Erica Benda, Tyler Hardin, and Elizabeth St. John (Dr. Andrea Holgado[1] and Dr. Kenneth Hensley[2]) Department of Biological Sciences, Southwestern OK State University[1]; Department of Pathology, University of Toledo, Ohio[2]

Alzheimer's disease (AD) is a progressive neurodegenerative form of dementia that affects millions of families in the US. Despite numerous research efforts, causes of AD are uncertain and treatments are under development. To this end, investigations have shown that a protein called Collapsin Response Mediator Protein 2 (CRMP2) is affected in most of the patients suffering AD. Under normal circumstances, CRMP2 plays an important role promoting neuronal survival and extension of neural processes. However, in AD, CRMP2 attaches to toxic neuronal tangles and it is unavailable for normal function. In collaboration with Dr. Kenneth Hensley of the University of Toledo, we have begun inventing and testing new drugs for their ability to treat AD and other diseases associated with CRMP2 dysfunction. Using a microscopic worm called C. elegans, we studied CRMP2 mutant worms and treated with an AD drug candidate: lanthionine ketimine-ethyl ester (LKE). Analysis of mutant animals treated with LKE for 96 h show that CRMP2 dysfunction can be partially restored by the treatment. The data provides evidence LKE function in intact animals, corroborates prior reports of LKE interaction with CRMP2, and reveals new opportunities for therapy development against many neurodegenerative disorders associated with abnormal CRMP2 functionality.

41. **Producing an Antibody to study Exocytosis in Nerve Cells.** Timothy Stein (Dr. Andrea Holgado) Department of Biological Sciences

Exocytosis is the process by which substances move out of the cell. The substances are transported in cytoplasmic vesicles, which then fuse to the plasma membrane and are released extracellularly. Research has shown that SNARE proteins mediate exocytosis, and that VSM-1 (v-SNARE Master Protein 1) may potentially regulate this process. To study the exocytic role of VSM-1 in C. elegans nematodes, we began the process of generating a VSM-1 polyclonal antibody using purified recombinant proteins

as antigens. Briefly, a recombinant DNA plasmid coding for C. elegans VSM-1 was produced. Expression of the recombinant tagged protein was induced and purified. Once enough purified recombinant VSM-1 protein is obtained, the purified protein will be sent to Maine Biotechnology Services to be injected into rabbits. After approximately four months, the rabbits will be bled to produce a raw serum which will be tested for immunoreactivity and used for immunoprecipitation and immunostaining. Once the raw post-immunization serum is examined, polyclonal antibodies will be purified and used to stain whole-mounted C. elegans nematodes and examine protein expression and protein interactions. Together, these studies will help us determine where VSM-1 is expressed in C. elegans and which proteins VSM-1 relates to in vivo.

42. **Genomic Wide Analysis of vsm-1(ok1468) Mutant Caenorhabditis elegans Using Microarray.** Ashley Rodriguez, Josiah Dittrich, and Kody McKya (Dr. Andrea Holgado) Department of Biological Sciences

If a method to increase the synaptic density in human's frontal lobe and hippocampus can be engineered, then learning and memory could theoretically be genetically enhanced. A synapse is a cellular junction that is formed by the presynaptic terminal of the signaling cell and the postsynaptic terminal of the target cell. A neuron communicates to other neurons by secreting neurotransmitters into synapses, which then bind to neuroreceptors on the target cell. Previous studies have shown that a protein, VSM-1, regulates the exocytosis of neurotransmitters from the presynaptic terminal. vsm-1 mutants have shown an increase in synaptogenesis when compared to the wild type. We hypothesized that genes are expressed in vsm-1 mutants that enhance synaptogenesis. In order to analyze the genes of interest we utilized the tools of microarray. In our experiments, we first isolated the total RNA from young-adult wild-type and vsm-1 mutant Caenorhabditis elegans. Next, we synthesized cDNA from reverse transcription of the isolated RNA. Hybridization of the cDNA to a microarray was performed to facilitate gene expression profiling. Last, fluorescently labeled microarrays were analyzed and the identity of induced and repressed genes was uncovered using the open source software called Magic tool. Microarray experiments were performed using three biological replicas for wild-type and vsm-1 mutants and two technical dye swaps. Our results suggest that induction of Major Sperm Proteins and Lin-2 coupled with the repression of several genes of interest may be the source causing increased synaptogenesis in the vsm-1 mutant C. elegans.

43. **Developing Transgenics to Study Mutant Rescue in C. elegans**. Elizabeth St. John, Monte Stone, Madison Cabaniss, and Pamela Moreno (Dr. Andrea Holgado[1] and Mr. Jeff Short[2]) Department of Biological Sciences[1]; Department of Engineering Technology[2]

C. elegans is a great model organism for genetic and molecular biology investigations and has presented many ways to study genes and proteins. One such protein is VSM-1, a potential regulator of secretory pathways of synaptic transmission between cells. Researchers working in yeast have shown that in the absence of VSM-1, a complex composed of SNARE proteins forms without inhibition, increasing the rate of secretion of vesicular contents. Thus, we hypothesize that VSM-1 may act by preventing vesicle fusion and exocytosis of neurotransmitters. However, rescue studies have shown that expression of VSM-1 in nerve cells alone is not sufficient to reverse the effects of the mutation and restore the behavior of the mutant back to wild type. Hence, our plans now are to test whether the presence of VSM-1 in muscle cells can affect the rate of synaptic transmission in the organism and rescue the vsm-1 mutant behavior. To accomplish this goal, we began generating a plasmid containing a muscle specific promoter driving the expression of VSM-1 fused to m-Cherry fluorescent protein. Once the plasmid was analyzed, we proceeded to microinject C. elegans with the plasmid and study rescue of VSM-1 function in mutant nematodes.

44. **Determining the binding partners of VSM-1.** Mandi Foutch, Nathan Bernhardt, and LaKesha Seals (Dr. Andrea Holgado) Department of Biological Sciences

VSM-1 (v-SNARE Master Protein 1) is thought to be an exocytosis regulating protein found in yeast and higher organisms. Studies from yeast have shown that VSM-1 partially inhibits constitutive exocytosis and the release of proteins into the extracellular milieu. Mechanistically, it was suggested that VSM-1 inhibits constitutive exocytosis by preventing SNARE complex formation. Thus, we hypothesize that VSM-1 may play a central role at the synapse. Specifically we postulate that VSM-1 mode of action in neurons is to prevent neurotransmitter release by disrupting the formation of SNARE (soluble N-ethylaleimide-sensitive factor attachment protein receptor) complexes. To test this hypothesis, we propose to investigate whether VSM-1 interacts with SNARE proteins in vitro and which are the consequences of such interactions. First, we induce the expression of tagged recombinant proteins for full-length GST::VSM-1, mutant GST::VSM-1, and GST as a negative control. Second, we engineered recombinant DNA plasmids containing sequences for SNARE synaptobrevin (SNB-1, a v-SNARE), syntaxin 1A (UNC 64, a t-SNARE), and the two SNAP 25 (RIC 4A and RIC 4B, t-SNARE). Third, we purify the GST fusion proteins using glutathione sepharose beads. Future experiments are to perform in vitro binding assays and competition assays using affinity purified polypeptides. Binding results will be analyzed using SDS-PAGE and gel densitometry.

45. **Switching Genes to Study Homology: A Progress Report.** Claudia M. N. Nkeih and LaKesha Seals (Dr. Andrea Holgado)) Department of Biological Sciences

VSM-1 studies show that yeast VSM-1 negatively regulates constitutive exocytosis of secretory factors into the medium. Since exocytosis of neurotransmitters tightly underlies synaptic transmission, we began a study focused on the functional role of VSM-1 in multicellular animals containing a nervous system. Preliminary studies have shown that C. elegans VSM-1 may also partially inhibit exocytosis in nerve cells. To determine whether this gene product plays a similar role in fruit flies, we began generating a rescue construct containing the C. elegans vsm-1 gene fused to the GFP gene. To do this, we amplified the vsm-1 cDNA using Pfu proofreading DNA polymerase. Then, we cloned blunt ended PCR products into a TOPO vector using TOPO isomerase technology (Invitrogen). TOPO clones were transformed into One Shot competent cells and taken up plasmids AKA ah114 were confirmed with Restriction enzyme digests. Last, vsm-1 cDNA was excised using Xba I, Nde I and ligated into a fruit fly expressing vector. The constructed rescue plasmid was fully sequence and undesired mutations were corrected using site-directed mutagenesis. New plasmid aka ah118COR containing the C. elegans vsm-1 gene is currently being injected into mutant fruit flies, where phenotypic rescue at the synapse will be studied.

46. **Heavenly Invaders? Students Supporting The Community And Environment By Investigating An Invasive Tree.** Tanner Wheeler (Dr. Lisa Castle) Department of Biological Sciences

Tree of heaven, Ailanthus altissima, has been considered both a problematic invasive and a desirable ornamental tree. Increased numbers of trees descended from intentionally planted ornamental trees may signal the start of an invasion in areas where the species has not previously been considered problematic. To test whether or not neighborhood trees were intentionally planted, students at Southwestern Oklahoma State University in Weatherford,OK counted and measured the trees or heaven and compared the distribution to that of known ornamentals. Based on the numbers of small individual trees, trees growing close together and trees growing close to human structures, we concluded that the majority of trees of heaven in Weatherford, OK were not intentionally planted. As students we hope to use the resulting baseline map to monitor population growth, tracking success of control measures and genetic testing to determine the source of the invasion around our campus community.

47. **Mapping Invaders from Heaven: (Ailanthus altissima).** Najuma Maharjan (Dr. Lisa Castle) Department of Biological Sciences

Ailanthus altissima, also known as Trees of heaven, is a rapidly growing non-native tree. Increased numbers of trees descended from intentionally planted ornamental trees may signal the start of an invasion in areas where the species has not previously been considered problematic. Student scientists ventured into the residential areas of Weatherford, OK in order to determine if trees of heaven are a problem in our community. Trees of heaven were censused, mapped, measured and we concluded that the majority of the trees of heaven in Weatherford, OK were not intentionally planted. On-going data collection is involving more students in monitoring and conservation around the campus community.

48. **Invaders From Heaven? Distribution Of An Invasive Tree**. Maria Ortega and Caleb Murrow (Dr. Lisa Castle) Department of Biological Sciences

Tree of heaven, Ailanthus altissima, has been considered both a problematic invasive and a desirable ornamental tree. Increased numbers of trees descended from intentionally planted ornamental trees may signal the start of an invasion in areas where the species has not previously been considered problematic. To test the hypothesis that distribution patterns reveal whether or not neighborhood trees were intentionally planted or spread as the result of an invasion, trees of heaven were mapped and measured in Weatherford, OK. Based on the numbers of small individual trees, trees growing close together and trees growing close to human structures, we concluded that the majority of trees of heaven in Weatherford, OK were not intentionally planted. The resulting baseline map can be used in monitoring population growth, tracking success of control measures and genetic testing to determine the source of the invasion.

49. **What Is At Risk? Students Assess Plants Vulnerable To Being Harvested**. Zella Classen (Dr. Lisa Castle) Department of Biological Sciences

Students taking plant science courses at regional universities scored wild harvested plants using the United Plant Savers' At-Risk Assessment Tool. This assignment met both educational and conservation goals. Educationally, students became aware of medicinal plant uses while learning to assimilate information from many sources. From the conservation stand point, a need for a concise compilation of information regarding wild-harvested plants was identified by the United Plant Savers, a non-profit group that has created a tool to rank plants based on their vulnerability to over-harvest. Initial tests demonstrated that the assessment tool works qualitatively and mathematically, but the small number of plants scored has limited the usefulness of the tool. Student scores of plants are consistent with scores from herbalists and botanists, suggesting that the data will make a valuable contribution towards a set of rankings useful in setting conservation priorities.

50. **Weedy Vines in Dry Times**. Irene Lopez and Ryan Christensen (Dr. Lisa Castle) Department of Biological Sciences

Accurate population dynamics data rarely exist for plant species that are neither threatened nor of agricultural importance. Despite its unusual dispersal physiology and close evolutionary relationship to medicinal species, Cyclanthera dissecta, an annual vine native to Western Oklahoma is one such species with limited population data. All individuals in a small Cyclanthera dissecta population were measured and marked in 2010 and 2011 in order to determine the size of the population and to test the accuracy of anecdotal reports that the local population was expanding. Contrary to original expectations, the population in 2011 was dramatically smaller than the 2010 population. Drought conditions in 2011 likely account for this result. Baseline data from this study will be used in longer term monitoring efforts and in investigations of the combined effects of disturbance, habitat fragmentation and drought conditions on a ruderal native species.

51. **Adaptations of Mayflies (Ephemeroptera) in Sandy Substrates**. Amber Rymer and Brett Baker (Dr. Peter Grant) Department of Biological Sciences

Sand is the predominant substrate of streams in western Oklahoma. This substrate presents a number of serious challenges to animals that inhabit this type of substrate. For example, the sand grains are easily shifted by the current and thus can be abrasive to animals within it. The level of oxygen concentration can be low, compared at least with rocky habitats, especially for very fine sediments. The availability of food tends to be low as levels of primary production and detritus are lower than in other types of substrates. As a result, sandy habitats tend to be very low in species diversity and have probably been neglected by ecologists for that reason. Species that do successfully inhabit sandy substrates exhibit special adaptations to anchor themselves in place or protect themselves from abrasion. We have been studying the ecology and behavior of mayflies in Deer Creek, a fourth order stream north of Weatherford, OK, for a number of years. One species inhabiting Deer Creek is Cercobrachys etowah Soldan. This mayfly burrows into the extremely fine sand along the stream margins where the current is very slow. The purpose of this poster is to examine the literature dealing with aquatic insects, mayflies in particular, that inhabit sandy substrates, to assist with our study to understand how C. etowah has been successful in this challenging environment.

52. **Genetic Analysis of O2-Signaling Using the Amoebazoan Dictyostelium as a Model**. Dr. Muatasem Ubeidat[1] and Dr. Chris West[2]; Department of Biological Sciences, Southwestern OK State University[1]; Department of Biochemistry and Molecular Biology, College of Medicine, University of Oklahoma Health Sciences Center[2]

Numerous mechanisms have evolved for cells to sense O2, the primary respiratory substrate for aerobic organisms, for metabolic regulation and other purposes. In Dictyostelium, a social soil amoeba, only 2.5% O2 is required for proliferation. However, 12% is required for slugs to culminate into fruiting bodies, and O2 also has instructive functions in slug polarity, slug migration, and cell-type proportioning. Many protists, including the agent for toxoplasmosis in humans (Toxoplasma gondii), show evidence for the Dictyostelium rather than animal model of O2-regulation described below.

Dictyostelium discoideum is a powerful biomedical model organism to study developmental regulation and cellular signaling because of the ease of molecular genetic, biochemical and cell biology approaches. The developmental process of this organism depends on environmental and internal signals and can be divided into two phases; the formation of a moving slug from solitary amoeba upon starvation and the switch from a slug to fruiting body that holds the spores, for dispersal, on an aerial stalk. The slug-to-fruiting body switch (culmination) is regulated by ammonia, O2, light and other factors, possibly acting via prestalk tip cells. Studies suggested that at least ten genes are involved in transducing the signal to allow the slugs to culminate and form a fruiting body. In this study, we seek to identify these genes using Restriction Enzyme Mediated Integration (REMI) to generate loss-of-function mutants that overcome the shortage of O2 (hypoxia) by forming fruiting body with spores.

53. **Cloning and expression of Alpha-Amylase from Bacillus licheniformis**. Rafel Alvarez and Ashley McCracken (Dr. Muatasem Ubeidat) Department of Biological Sciences

Alpha-amylase catalyzes the hydrolysis of alpha-1,4 glycosidic bonds in starch. To study the activity of this enzyme, we would like to clone it in an expression vector. The gene for alpha-amylase will be removed from B. licheniformis by HindIII restriction enzyme. The chromosomal DNA will be digested and then all fragments generated by this digestion will be ligated to pBRL vector. After that transformation will be performed in another bacterial host cells. The cells that digest starch on LB-starch plates are the ones that contain the alpha-amylase gene. The enzyme will be characterized using biochemical analysis methods.

54. **Cloning and Expression of Dictyostelium's Alkaline Phosphatase**. Carissa Curtis, Rachel Kauk, Will Seibold, and Brittani Tinney (Dr. Muatasem Ubeidat) Department of Biological Sciences

Genomics programs are creating enormous opportunities and sequence accessibility for biologists to study a high number of possible candidates for recombinant protein technology. Therefore, training students in this field is crucial. This is a project for independent study class and being used as a model for teaching research. The students will learn how to isolate and clone the gene in expression vector then isolate the protein and characterize it. This gene is present in all organisms including Dictyostelium (the source of this gene). The level of alkaline phosphatase (ALP,1 orthophosphoric monoester phosphohydrolase, EC 3.1.3) increases during cell differentiation of the cellular slime mold Dictyostelium discoideum. The cDNA was released from pSPORT vector and cloned into BamHI of pET32a expression vector. The protein was detected and isolated.

55. **Mitochondrial Complex I Inhibition By Flexhet Anticancer Drugs Occurs At The Rotenone Sensitive Site Of NADH:Ubiquinone Oxidoreductase.** Savannah Simon and Ashlie Walker (Dr. William Kelly) Department of Chemistry and Physics

Objective: Recent efforts in our laboratory suggest that SHetA2 is an uncompetitive inhibitor of mitochondrial Complex I. Researchers have demonstrated three binding sites for Complex I inhibitors based upon careful evaluation of kinetic data. They are: Class I/A (the prototype inhibitor of which is Piericidin A), Class II/B (the prototype of which is Rotenone) and Class C (the prototype of which is Capsaicin). Of these three sites/classes only Rotenone and Rotenone-sensitive inhibitors generate a large flux of ROS during inhibition. Since all flexhets, and ShetA2 in particular, generate a significant flux of ROS prior to apoptosis it was hypothesized that SHetA2 binds to the same region as Rotenone. The purpose of this project was to determine if SHetA2 is a Rotenone-sensitive inhibitor of Complex I.
Methods: Whether SHetA2 exhibited Rotenone-sensitive inhibition was determined by two experimental approaches. The minimum concentration of SHetA2 necessary for maximum inhibition of Complex I was first determined and then additional Rotenone was added and any change in Complex I inhibition was determined. Likewise the minimum concentration of Rotenone required for maximum inhibition of Complex I was determined and addition SHetA2 was added and any change in Complex I activity was assessed. Enzyme activity was assayed spectrophotometrically using the decrease in absorbance at 340 nm over time, following the addition of NADH in the presence of various concentrations of inhibitors.
Results: Addition of up to 400 nanoM Rotenone, four times the Rotenone dose required to completely inhibit Complex I, does not increase Complex I inhibition in SMP treated with the maximum dose of SHetA2. Likewise, addition of up to 16 microM SHetA2, twice the flexhet dose required to reach maximum inhibition of Complex I, does not increase Complex I inhibition in SMP treated with the maximum dose of Rotenone.
Conclusion: The inhibition of full Complex I activity observed in bovine SMP upon treatment with SHetA2 occurs at the Rotenone-sensitive site.

56. **Computational Study Of Chlorine Atom Complexation In Noncomplexing Solvents**. Jonathan Walker (Dr. William Kelly) Department of Chemistry and Physics

Russell first described the effect of solvation on the selectivity of chlorine atoms in hydrogen abstraction reactions. More recently, several authors have published evidence of chlorine atom complexation in solvents previously believed to be "noncomplexing". Chateauneuf attributed the long wavelength UV absorption observed in solutions of chlorine atoms in chlorinated solvents to a chlorine atom/solvent molecule charge-transfer complex. Both Chateauneuf and Dneprovskii et. al. have provided kinetic evidence that suggests that the chlorine atom forms complexes with halogenated solvents and that these complexes exhibit higher selectivity in hydrogen abstractions than the "free" chlorine atom. We have carried out theoretical studies on a

series of chlorine atom complexes with a variety of halogenated alkanes (CH3X/Cl, CH2X2/Cl and CHX3/Cl, CH2XCH2X/Cl, CH3CHX2/Cl and CH3CH2CH2X/Cl; X=Cl or Br), with an aim to identifying and evaluating minimum energy structures of the various complexes. A variety of geometries of the chlorine atom were analyzed and only the stationary states corresponding to true minima (no imaginary frequencies) were evaluated further. Complex stabilization energies were determined using the supermolecule approach. Computations were carried out employing Density Functional Theory (UB3LYP and UBHandH) and post Hartree-Fock methods (MP2, MP4 and QCISD) employing moderately large (6-311+G2df,p) and very large (6-311++G3df, 3pd) basis sets. Optimizations were carried out both with and without counterpoise (CP) correction of basis set superposition error, all final energies were computed with CP correction. We find that both DFT functionals fail to identify stationary points revealed by the post HF methods. The results of these computations show that the complex stabilization energies (5 to 22 kJ/mol) are greater in the bromomethanes compared to the chloromethanes and decrease with increasing halogen content. Computed complex stabilization energies show a strong linear correlation with halomethane ionization potentials, consistent with the proposition that the chlorine atom forms a donor/acceptor complex with the halogenated molecules.

57. **Characterization and Synthesis of Zn(1,8-dimethylcyclam)Cl2**. Jonathan Walker (Dr. Tim Hubin) Department of Chemistry and Physics

Cyclam and a propyl-bridged cyclam were synthesized as a precursor and ligand for complexation respectively. The low yield of the propyl-bridged cyclam forced the complexation with Zinc to be done with the 1,8-dimethylcyclam precursor. This complex is novel and creates a compound that can be used for comparison to its bridged counterparts. Upon complexation, Zn(dimethylcyclam)Cl2 was characterized by NMR, UV-Vis, IR, Cyclic Voltammetry, Magnetic Susceptibility, Conductance, Elemental Analysis, and Mass Spectral Analysis. Since there is no known crystal structure for the compound, crystallizations were also prepared to obtain the crystal structure.

58. **GTP Allosterically Orders the Oxyanion Loop of CTP synthetase for Interaction with 6-diazo-5-oxo-L-norleucine.** Jonathan Walker (Dr. Jason L. Johnson) Department of Chemistry and Physics

Catalysis in CTP synthetase (CTPS) initiates through a nucleophilic attack by C379 on glutamine, forming a thioester intermediate and releasing ammonia. An accompanying tetrahedral transition state is stabilized via H-bonding with G352 within the oxyanion loop. Upon release, nascent ammonia traverses an intermolecular tunnel to react with UTP. GTP is known to activate glutamine hydrolysis; we question whether an ordering of the oxyanion loop to optimally position hydrogen-bond donors mediates this activation. Our method is to position a tryptophan probe into the oxyanion loop of CTPS via the construction of Y355W. Changes in fluorescence lifetime, exposure to acrylamide quenching, and anisotropy of W355 upon GTP binding will be compared with fluorescence changes that accompany each catalytic stage of glutamine hydrolysis. While glutamine occupying the active site and engaged in catalysis decreases the anisotropy (r) of W355 from 0.160 to 0.151, the GTP binding increases r to 0.171, even in the presence of glutamine. GTP also decreases the collisional rate constant (ksv) of W355 with acrylamide from 1.45 to 1.00 ns-1 M-1. By comparison, covalent modification of the glutaminase active site by the glutamine-thioester mimic 6-diazo-5-oxo-L-norleucine (DON) increases r to 0.180. Unlike GTP, DON also lowers the lifetime of W355 from 4.2 to 3.2 ns while increasing ksv to 1.88 ns-1 M-1. Increases in the anisotropy of W355 accompanying CTPS interaction with GTP and DON are consistent with a resultant ordering of the oxyanion loop. Moreover, the change induced by both ligands bound together to CTPS is less than the sum of their individual effects, suggesting that GTP and DON impact loop dynamics via a shared mechanism. GTP's binding site has been predicted to occur within a gap though which exogenous ammonia may otherwise enter; the occupation of this opening by GTP may explain its marked restriction of acrylamide accessibility to W355.

59. **V60L Uncouples Glutaminase and Synthetase Activities in CTP synthetase: GTP Partially Restores Coupling**. Ashlie Stacy and Mary Bayer (Dr. Jason L. Johnson) Department of Chemistry and Physics.

CTP Synthetase (CTPS) catalyzes glutamine hydrolysis (GATase) in one domain, releasing ammonia to serve as a nucleophile in a distant amidoligase (ALase) domain. Crystal structures have identified a tubular passage between the GATase and ALase sites, highlighting a possible route for nascent ammonia. P54 and V60 create the narrowest constriction of this passage. GTP serves as an allosteric activator of the enzyme, enhancing GATase activity and, perhaps, optimizing the conformation of the ammonia passage. We seek to assess the validity and GTP-dependence of the proposed molecular passage. Our method is to replace P54 and V60 with smaller (P54A, V60A) and larger (P54L, V60L) residues and monitor the dependence of their GATase and CTP synthesis activities on GTP concentration. The ratio of CTP synthesis to GATase activity defines the coupling parameter (CP) between active sites. Mutation of P54 dramatically reduces both CTP synthesis and GATase activities. These data highlight P54 as integral to structure/function but unsuitable as a target for the systematic, engineered blockage of the proposed ammonia passage. By contrast, V60L exhibits normal GATase activity and a CP value of 0.84 when GTP is saturating. In the absence of GTP, the value of CP is reduced to 0.09. By comparison, wild-type enzyme and V60A maintains perfect coupling (CP=1) with and without GTP. These data are consistent with the V60L mutation projecting a larger R-side chain into the passage and partially obstructing ammonia delivery, and GTP allosterically organizing the ammonia passage to widen it beyond the V60L obstruction.

60. **Incorporation Of Phenylamine Functionalized Single-Wall Carbon Nanotubes Into Polyimides**. Issac Schneberger (Dr. David Martyn) Department of Chemistry and Physics

Single-wall carbon nanotubes were functionalized with phenylamine and incorporated into a polyimide. The nanotubes were functionalized via dissolving metal reduction using halophenylamine donor compounds. Lithium metal was used as the electron donor in all reactions. Four different halophenylamines, fluoro-, chloro-, bromo-, and iodoaniline, served as sources of the phenylamine functionality. Spectroscopic and gravimetric analysis of the products revealed significant functionalization and the presence of amine functional groups on the SWNT. The products of these reactions were used as comonomers and incorporated into a polyimide.

61. **Reactions of the Octachlorodirhenate anion with 1,4,8,11-Tetraazacyclotetradecane**. Zachary Daniel (Dr. David Esjornson) Department of Chemistry and Physics

A series of reactions between tetra-n-butyl ammonium octahalodirhenate and 1,4,8,11-Tetraazacyclotetradecane (Cyclam) were screened in order to determine the optimal conditions for the addition of Cyclam without cleavage of the dirhenium unit. Both the Octachlorodirhenate and the Octabromodirhenate tend to react with Cyclam to make complexes of limited solubility. Characterization of the products with Nuclear Magnetic Resonance and electrospray Mass Spectroscopy indicate Cylam bonded to dimeric rhenium species. The reactions were carried out in a variety of solvents, at a variety of temperatures, and in the presence or absence of Potassium hexafluorophosphate. The most promising results were obtained from refluxing Dichloromethane in the presence of KPF6.

62. **Hydrogen Adsorption On An 85-Atom Gold Cluster and Gold/Platinum Bimetallic Clusters: An ONIOM/Density Functional Theory Study**. Dr. Douglas Linder[1] and Dr. Alberto Striolo[2]; Department of Chemistry and Physics, Southwestern OK State University[1]; School of Chemical, Biological, and Materials Engineering, The University of Oklahoma[2]

Although the large-scale production of catalysts with well-controlled properties remains a major challenge, progress is being made in intelligent catalyst design toward a number of hydrogenation reactions. In this poster results will be presented for hydrogen (H2 and H) adsorption on the surface of Au85 and several Au85Pt1 clusters. In the later, platinum will be incorporated in locations that are in interior, edge, or corner positions within the clusters. Equilibrium geometries and adsorption energies for the hydrogen adsorption will be presented at the ONIOM(B3LYP/LanL2DZ:UFF) level of theory. The ultimate aim of this research is to determine the structure and composition of a bimetallic transition metal catalyst that maximizes selective hydrogenation of acrolein to allyl alcohol. Using ONIOM(DFT:UFF) computational methods, we will carry out a series of computational experiments to determine the best arrangement of transition metal atoms to obtain the desired product, and detail the geometric and electronic properties responsible for the transformation.

63. **Synthesis and Evaluation of Transition Metal Complex Dual CXCR4/CCR5 Antagonists**. Paul Won (Dr. Tim Hubin) Department of Chemistry and Physics

Activation of cellular responses, such as the homing of cells during fetal development and the immune response, by small signaling proteins called chemokines, through their binding to membrane-bound chemokine receptor proteins, is a fundamental biological process. Yet, chemokine-receptor pairs participate in a number of abnormal conditions, such as the development and progression of inflammation, and the growth and spread of malignant cells. Often in these disease states, receptor over-expression is observed, and progression of the abnormality can be mediated by small molecule receptor antagonists. As 20 chemokine receptors and 46 chemokines are known, with few of these participants exclusive to their partners, a huge number of targets for antagonists are possible. Indeed, progress towards the development of a number of single-chemokine receptor antagonists has been steady. However, the promiscuity native to chemokines provides for the possibility of the defeat of a single-receptor antagonist, as alternate chemokine/receptor interactions can circumvent the blocked signal.

The two most studied chemokine receptors, due to their function as required co-receptors for HIV infection, are CXCR4 and CCR5. However, CXCR4 and CCR5 are linked through a number of other diseases: arthritis, inflammatory states, and a growing number of cancers. Researchers needing tools with which to study these diseases might benefit greatly from dual CXCR4/CCR5 antagonists. Notably, specific calls for dual CXCR4/CCR5 antagonists have appeared recently in the literature in the contexts of the study and treatment of HIV, the study and treatment of cancer, and the general study of chemokine receptors. For these reasons, we have chosen to design, synthesize, and screen the biological activity of dual CXCR4/CCR5 antagonists. These antagonists are based on topologically constrained tetraazamacrocycle transition metal complexes. The synthesis and characterization of these complexes, along with preliminary screening data on their CXCR4 and CCR5 antagonism will be presented.

64. **The Synthesis and Characterization of Fe(1,8-dimethylcyclam)Cl_2.** Alexandria Foster (Dr. Tim Hubin) Department of Chemistry and Physics

Ethylene cross-bridged tetraazamacrocycles have become a standard choice of ligand when the need is to create a stable first-row transition metal complex. The short cross-bridge imparts unique characteristics to these ligands. A recent report on the Cr^{3+} complexes of the unbridged 1,8-dimethylcyclam ligand caused us to reexamine the nature of the *cis*-configuration of complexes with analogues of ethylene cross-bridged cyclam. We decided to interrogate the *cis*-binding properties of 1,8-dimethylcyclam for comparison to the complexes of ethylene cross-bridged cyclam. If 1,8-dimethylation is enough to produce the *cis*-configuration, perhaps some of the benefits associated with ethylene cross-bridging can be realized in the complexes of 1,8-dimethylcyclam. Separating the topological effects of the cross-bridge of ethylene bridging from the benefits of the 1,8-dimethyl arrangement, without the bridge, might shed light on the need for cross-bridging. To do so, we have prepared close analogues of the known first row transition metal ethylene cross-bridged ligand dichloride complexes with 1,8-dimethylcyclam and have characterized there electronic, solution, and solid state properties for comparison. Presented in this poster are the synthesis and characterization of Fe(1,8-dimethylcyclam)Cl_2.

65. **The Berkeley Open Infrastructure for Network Computing (BOINC).** Mary Ann Phillips (Dr. Warren Moseley) Department of Accounting, Computer Science, and Entrepreneurship

The Berkeley Open Infrastructure for Network Computing (BOINC) is a non-commercial middleware system for volunteer and grid computing. It was originally developed to support the SETI@home project before it became useful as a platform for other distributed applications in areas as diverse as mathematics, medicine, molecular biology, climatology, and astrophysics. The intent of BOINC is to make it possible for researchers to tap into the enormous processing power of personal computers around the world. BOINC has been developed by a team based at the Space Sciences Laboratory (SSL) at the University of California, Berkeley led by David Anderson, who also leads SETI@home. As a "quasi-supercomputing" platform, BOINC has about 527,880 active computers (hosts) worldwide processing on average 5.549 petaFLOPS as of March 2011, which tops the processing power of the current fastest supercomputer system . BOINC is funded by the National Science Foundation (NSF) through awards SCI/0221529, SCI/0438443 and SCI/0721124. SWOSU is now a contributor of the Stafford 259 resources to the BOINC volunteer project. This is the first step in a multi-step process bringing High Performance Computing, both Parallel and Distributed Computing to the SWOSU campus. The lab in Stafford 259 with the appropriate clients are properly linked to the BOINC network. Some of the more interesting projects would be the Climate Prediction Model and the World Community Grid. After the establishment of connections to these global projects. The long term goal for this project is to bring the networking software in house and to be able to provide this type of services to high schools across Western Oklahoma.

66. **Dissolution Rates Enhancement of Raloxifene Using Binary PEG Mixtures**. Kara Connelly (Dr. Rahmat Talukder) Department of Pharmaceutical Sciences

12:30 PM

Purpose: The aim of this study is to enhance the dissolution rates of raloxifene by developing solid dispersions using a mixture of polyethylene glycols.
Methods: Two granulation methods were used. In melt method PEG 8000 was melted at 70ºC and the drug or drug-surfactant (SLS) mixture was added and mixed well with molten PEG. The dispersions were rapidly cooled and refrigerated. In the solvent method, solutions of the PEG-drug or PEG-drug-surfactant mixtures were made in chloroform, then dried and refrigerated for further processing. Solid state characterization and dissolution studies of the granules were done.
Results: Thermograms of raloxifene showed an endothermic event related to the loss of crystallization upon decomposition at approximately 260°C. PEG 8000 showed a melting peak at 55.6º, which did not change in the presence of SLS. The dispersions showed minor endothermic event around 250º, but the melting peak of PEG was lowered to 53.8. These changes in thermograms are attributed to the fact that raloxifene might have dissolved and partially lost its crystallinity in melted PEG. FTIR spectroscopy study of raloxifene and PEG showed a new absorption peak, which may be attributed to the attachment of hydroxyl group of PEG to amine group of raloxifene. The dissolution profiles showed that in 60 minutes, when the drug alone was used, only 20% went into solution, while that was increased to about 50% from raloxifene-PEG dispersion at a ratio of 1:1.
Conclusion: Solid dispersions with PEG enhance dissolution rates of raloxifene. Mechanistically it appears that PEG molecules form conjugates with raloxifene, which increases the dissolution rates of raloxifene.

67. **Synaptic Connections are Regulated via VSM-1, a SNARE Interacting Protein**. LaKesha Seals (Dr. Andrea Holgado) Department of Biological Sciences

12:50 PM

Eukaryotic membrane fusion is mediated by SNARE complex formation. VSM-1, a SNARE interacting protein regulator, prevents the formation of SNARE complexes and inhibits fusion. Work reported by Gerst and collaborators have shown that yeast syntaxin and synaptobrevin bind to VSM-1 in a phosphorylation dependent manner. This process resulted in the inhibition of exocytosis at the vesicular priming step. To expand our knowledge on the mediation of intracellular membrane trafficking underlying synapse formation, we began characterizing the functional role of VSM-1 in the genetic model organism C. elegans. First, we determined that endogenous VSM-1 is expressed in nematodes and enriched at synapses. Second, using diverse assays the phenotype of a vsm-1 mutant isolated by the Oklahoma Genome Consortium was characterized. For instance, pharmacological assays showed that vsm-1 mutants have an enhanced sensitivity to “Aldicarb,” a cholinesterase inhibitor. This phenotype can be interpreted as a consequence of increased neurotransmitter release in the mutant background and/or greater synaptic connectivity. Third, immunostaining analysis focusing on neuromuscular junctions showed that mutants lacking a normal VSM-1 protein have a greater density of synaptic varicosities when compared to wild-type nematodes. Lastly, analysis of associative learning and memory demonstrate that vsm-1 mutants developed enhanced short and long-term memory.

68. **Lanthionine Ketimine Ethyl Ester Affects Presynaptic Neurotransmission In C. Elegans And Partially Rescues A Neuro-Developmental Defect In UNC-33 (DPYSL2/CRMP2) Hypomorphs**. Erica Benda (Dr. Andrea Holgado[1] and Dr. Kenneth Hensley[2]) Department of Biological Sciences, Southwestern OK State University[1]; Department of Pathology, University of Toledo, Ohio[2]

1:10 PM

Lanthionine ketimine (LK) is a natural sulfur amino acid metabolite with potent neurotrophic activity. Proteomics indicate that LK interacts with collapsin response mediator protein-2 (CRMP2/DPYSL2/UNC-33) and syntaxin binding protein-1 (STXBP1/UNC-18) that are involved with cytoskeletal remodeling and presynaptic vesicle trafficking, respectively. In order to test the hypothesis that LKE activities are mediated through UNC-33 and/or UNC-18, neuropharmacology studies were undertaken using Caenorhabditis elegans wherein the genetics of the putative protein mediators could be manipulated. A cell-permeable LK-ester (LKE) was administered to developing RM3128 C. elegans engineered to express yellow fluorescent protein (YFP) in cholinergic neurons as an aid to assess neural morphology. Developmental LKE exposure induced neural commissure bundling and diminished onset of aldicarb-triggered paralysis in C. elegans RM3128 nematodes but did not affect aldicarb sensitivity in N2 nematodes that did not express YFP. When YFP-expressing unc-33(e204) hypomorphic nematodes (D389N substitution mutants) were exposed to LKE during development, LKE rescued the neuroanatomical defect of incomplete dorso-ventral neural commissure connectivity that is characteristic of this strain and improved its locomotor function. LKE effects on aldicarb sensitivity and commissure morphology were dependent both upon UNC-33 and UNC-18 because unc-18 null mutants lost LKE sensitivity and LKE-induced commissural bundling phenotypes. These data suggest a possible function for LK as an endogenous regulator of neurotransmission and neuritic structural plasticity; corroborate roles for UNC-33/CRMP2 and UNC-18/STXBP1 in the mechanism of LKE activity; and suggest the potential of LKE as a therapeutic molecule.

69. **Ill Advised Dual Relationships In The Workplace: But How Will We Get Our Girl Scout Cookies?** Sukriti Aryal (Dr. Hank Ramsey) Department of Finance, Management, and Marketing

1:30 PM

Most organizations have a no solicitation policy. Yet this policy is often forgotten or ignored when employees wish to sell raffle tickets or merchandise in the workplace. What is the appropriate response when your boss asks you to buy Girl Scout cookies to support a child's scout troop? Should you remind your boss of the "no solicitation" policy? What is taking place is the creation of a dual relationship and this is unhealthy because it distorts the line of authority. This paper will propose a re-examination of no solicitation policy in the workplace.

70. **Creative Writing Selections**. Kathrine Biggs, Lacie Thompson, and Jolie Hicks (Dr. Victoria Gaydosik) Department of Language and Literature

1:50 PM

Three students will present creative writing showing different styles and techniques.

Kathrine Biggs: "Meatloaf's Last Stand"--This comic fiction story recounts a battle in a typical American kitchen between healthy foods such as fresh fruit and vegetables and stinky food such as meatloaf. The target audience is young readers, and the story itself should be classified as Young Adult Fiction.

Lacie Thompson: "The M.M. Revolt"--This satirical piece pictures mice as a mafia-style organization and captures conversations and events as the mice try to advance their nefarious agenda.

Jolie Hicks: "If They Ask Me, I Will Tell Them"--This example of creative non-fiction presents a slice of family life with unexpected consequences that arise when children only partially understand a parental explanation of a grown-up concept, and the embarrassing results that arise for the parent in question.

71. **Kind Lies and Cruel Truths: Oppositions in Ibsen's "A Doll House".** Dr. Victoria Gaydosik, Department of Language and Literature

2:10 PM

Henrik Ibsen's late nineteenth-century play "A Doll House," like so many European and American works of the period, ostensibly focuses on "the woman question," examining it from yet another angle. Ultimately, however, Ibsen's perspective illuminates the gender stereotypes that not infrequently obstruct a complete and sympathetic understanding of human nature, and he forces his readers to re-examine what they think they know about men and women. His four chief characters are arranged in a kind of double chiasmus: a double doubling with a double reverse twist. This intricate mimetic structure calls into question our familiar concepts of masculinity and femininity, requiring us to see them both merely as instantiations of humanity.

72. **An In depth Analysis of Moll Flanders by Daniel Defoe**. Anastacia Speed (Dr. Helen Maxson) Department of Language and Literature

2:30 PM

At first glance Moll Flanders by Daniel Defoe seems like an episodic tale of a less than moral life lacking any kind of structure, plot, climax, or meaning. And yet when one digs deeper into the story a plot is revealed and carefully hidden messages begin to unravel as the depth of Moll's character slowly comes to light. Moll Flanders shows her own breed of heroism. She possesses the classic qualities of victorious bravery relentlessly defying her own circumstances in opposition to unfair social oppression. Although she does so in a less than admirable manner, sacrificing morals for the lust of greed, she effectively unmasks the flaws of society while surviving in a man's world. Just as Moll has multiple dimensions, so too does Daniel Defoe deploy a multitude of artistic styles to convey three separately significant messages layered throughout the book.

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