Seventeenth Annual
Student Research and Scholarly Activity Fair
Tuesday, April 6, 2010

Welcome,

The students, sponsors, and University Research and Scholarly Activity Committee appreciate your attendance at the Fair. Students and sponsors have committed many hours 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 Ms. Anita Blankenship, Director of Sponsored Programs, and Ms. Berva Pool, Sponsored Programs Specialist, for their continuing efforts for the University Research and Scholarly Activity Committee. Thank you to Karen Wilson 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. Arden Aspedon	Mr. Jess Parker	Dr. Valerie Reimers
Dr. Rahmat Talukder	Dr. Muatasem Ubeidat	Mr. Nolan Lawless
Ms. Mary Lawless	Ms. Anita Blankenship (Ex. Officio)	Ms. Berva Pool (Ex. Officio)

Title, Student, (Sponsor), Department, Abstract

1. **Enhancing Bowling Game Play with Machine Vision and Network Automation.** Travis Daugherty, Thomas Seidel, Christopher Parton, Cody Roper, Justin Welcher, Corey Waller, Steven Mettz, and Alejandro Pinon (Mr. Jeff Short) Department of Industrial and Engineering Technology

   Engineering Technology Manufacturing Each graduating class is required to do a capstone class. This years Engineering Technology class approached Southwestern Lanes in Weatherford (a bowling alley) to do ours. We were given the problem of implementing design changes to the bowling alleys scoring system and how it controlled the mechanical mechanisms that set the pins up. The solution we proposed would eliminate some of the work that the machines would do, thus saving power and reducing wear and tear on the machines. Ordinarily this would be a simple process with aftermarket parts, but in this instant the knowledge base was very limited. So in order to accomplish the goal, engineering would be required. We worked with two different models. One of the models used older technology and would not be as efficient as the newer technology model. After getting to know the two technologies better we decided to put our effort in getting the newer, more expensive technology to work. The newer technology consisted of a computer expansion card that was installed in a computer chassis. The computer chassis is what controls the mechanisms behind the lanes. After installing the cards, which consisted of making alterations to the existing wiring harness, then communications and software changes needed to be made. During the process records were kept in order to create better instructions and a diagnostics knowledge base on the system.

2. **Rocket Explosion Risk Analysis**. Knadi J. Archer (Dr. Thomas McNamara) Department of Mathematics

   We analyze the area at risk in the event of a catastrophic launch failure, in other words, a rocket explosion. Starting with the simplest physical assumptions, we proceed to more realistic models of increasing complexity. Graphical and numerical simulation will be provided throughout in order to help with visualization.

3. **International Green Design**. Kyle Johnson, Martin Lopez, Lea Williams, and Julie Campbell (Ms. E. K. Jeong) Department of Art

   International Green Design is a green conscious organization dedicated to preserving our planet. The SWOSU students have joined hands with other colleges across the world to discuss how we can make a positive impact in the ever-growing pollution problem. The SWOSU IGD have focused their efforts into combining recycled and environmentally friendly materials to create a new piece of art. The students and faculty have been encouraged to participate in this project by donating unwanted artwork such as test prints, sketches, and mess-ups. To raise awareness of recycling and its benefits, the IGD have created stickers to place in the windows of businesses. These stickers represent specific areas of their involvement in the recycling movement.

4. **Astrophotography and Stellar Spectroscopy**. Michela Alexander, Jonathan Brooks, Kenneth Franke, and Michael Moore (Dr. Tony Stein and Dr. Wayne Trail) Department of Chemistry and Physics

   A spectrograph analyzes the composition of bodies in the solar system and deep-space by separating light into its component colors. We have used a spectrograph to analyze the sun. We have also used the SWOSU observatory and telescopes to photograph a variety of astronomical objects. This project was funded by a NASA grant administered by Madeline Baugher.

5. **Building Lightning Detecting Electric Field and Magnetic Loop Antennas**. Wessley Lamoreaux and Justin Silkwood (Dr. Tony Stein) Department of Chemistry and Physics

   Lightning produces pulse of electric and magnetic fields that can be detected hundreds of kilometers away. We designed, built, calibrated and deployed a magnetic field loop antenna and a capacitive electric field antenna with accompanying signal amplifying circuits to measure these fields. Here we will discuss lessons learned from building and testing these devices as well as the data gathered from lightning strikes. Funding was provided for this project through a NASA/EPSCoR grant. Additional help was provided by Dr. Bill Beasley from Oklahoma State University.

6. **Therapeutic Piano Playing in the Treatment of Post Traumatic Stress Disorder**. Valerie Joy Yocum

(Dr. Sophia Lee) Department of Music

The presentation will describe post traumatic stress disorder. It will then give an overview of my literature review and discuss current treatments for PTSD. After the overview the study will describe uses of music therapy in current treatments and discuss the effectiveness of such treatments. Finally the presentation will present the procedure which the study hopes to implement using piano as a therapeutic median for treatment.

7. **Structure Determination of Giganticine by Computationally Predicted 13C NMR Shifts**. Chase Stroud (Dr. Cody Timmons) Department of Chemistry and Physics

   A novel natural product was isolated from the root bark of an Indian shrub in 1998. Dubbed giganticine, this compound's structure was reported to be a novel non-proteogenic amino acid. Subsequent synthesis of the putative structure revealed that the originally proposed structure was incorrect. Presently, efforts are underway to ascertain the correct structure via 13C NMR shift calculations using quantum chemical software. The findings support the assumption that the originally proposed structure is indeed incorrect.

8. **Differential Pulse Anodic Stripping Voltammetry (DPASV) for the Detection of Barium from Oil Well Water.** Crystal Mars (Dr. Curt Woolever) Department of Chemistry and Physics

   Differential Pulse Anodic Stripping Voltammetry (DPASV) has been applied for quantitative determination of Barium (Ba) from oil well water samples. These oil well water samples are from wells that have been under waterflood. The use of different concentrations of lithium perchlorate as well as different DPASV parameters, such as pulse amplitude and scan rate, has been investigated for quantitation of Ba.

9. **Phenylamine Functionalization of Single Wall Carbon Nanotubes for Use in Polymers**. Shelby C. Josefy, Logan D. Howard, and Natalie C. Simpson (Dr. David E. Martyn) Department of Chemistry and Physics

   Single-wall carbon nanotubes were functionalized with phenylamines using dissolving metal reduction and halophenylamine donors. A number of different reaction methods and procedures were explored to determine which would be the most efficient and reproducible. Lithium metal was used as the electron donor in all reactions with fluoro-, chloro-, bromo-, or iodoaniline serving as the source of the phenylamine functionality. Ultraviolet-visible and infrared spectroscopic analysis of the reaction products revealed significant functionalization and the presence of amine functional groups. The products of these reactions will be incorporated into polyimides and polyamides in future studies. The long-term goal of this research is the production of lighter and stronger polymers through use of single-wall carbon nanotube (SWNT) as comonomers. Polymers and composites incorporating carbon nanotubes have been found to display superior physical properties compared to their unmodified counterparts. Incorporation of different functional groups and development of new functionalization methods will allow further development of these materials.

10. **Reductions of Alkynes with Electron-rich Metal Complexes**. Joshua Marquette (Dr. David Esjornson) Department of Chemistry and Physics

    Attempts are being made to synthesize characterizable η^1 - Alkyne Metal complexes and to test whether reductive modification of the bound alkyne is possible. Rhenium complexes have shown a propensity to react with a variety of small molecules. Since rhenium is used as a promoter in Fischer-Tropsch Catalysis, there is continued interest in carbon reduction and possible C-C bond formation with rhenium complexes. Alkyne-rhenium chemistry is dominated by the side on, η^2 – coordination of the carbon-carbon triple bound. The η^1 – Alkyne coordination is possible for rhenium with terminal alkynes that have been reacted with rhenium hydrides. Deprotonation of terminal alkynes prior to interaction with the rhenium centers could lead to η^1 – coordination. An attempt will be made to react acetylides with rhenium complexes that have already shown reactivity with carbon monoxide, isocyanides, and nitriles, since acetylides ($RCC:^{\ominus}$) are formally isoelectronic with these small molecules. Metal-Metal triply bonded complexes have been found in the past to participate in both C-C coupling reactions and non-coupling reduction reactions. Triply bonded complexes of the type $Re_2Cl_4(PR_3)_4$ with either four monodentate phosphines or two bidentate phosphines, have already shown reactivity towards carbon monoxide, isocyanides, and nitriles. The role of steric hindrance in suppressing the η^2 – Alkyne coordination will be explored. Steric hindrance will be controlled from the choice of alkynes (TMS-acetlylene, Trimethyl(propargyl)silane, p-tolylacetylene, and benzylacetylene), the choice of phosphines (trimethyl phosphine, triethyl phosphine, triphenyl

phosphine, bis(diphenylphosphino)methane, and the choice of halide (chloride, bromide).

11. **Does Ring Size Matter? Cyclen Based CXCR4 Antagonists.** Desiray J. Cannon (Dr. Timothy J. Hubin) Department of Chemistry and Physics

    Background and Objectives: The CXCR4 co-receptor has become a target for the treatment of HIV via fusion inhibitor drugs. AMD3100, a bis-tetraazamacrocycle compound based on the 14-membered Cyclam structure, has been studied intensively as a CXCR4 antagonist. We aim to develop new antagonists for CXCR4 based on a related, 12-membered tetraazamacrocycle named Cyclen. Methods: Bis-tetraazamacrocycle ligands containing linked Cyclens have been designed and synthesized, along with their Cu2+ and Zn2+ complexes. X-ray crystallography has revealed the complex conformations. Anti-HIV screening and CXCR4 binding studies have been performed. Results: X-ray crystallography has shown the conformational selectivity of the complexes is similar to their Cyclam analogues. Anti-HIV screening has revealed these complexes as highly active fusion inhibitors. CXCR4 binding studies have shown strong binding of the complexes in competition with CXCR4-specific monoclonal antibodies. Discussion and Conclusions: Modification of AMD3100 by changing the ring size has resulted in similar efficiency of these antagonists relative to AMD3100. An unexpected result is that the meta-linked analogues of Cyclen are more active than the para-linked analogues. This is the reverse of the usual trend for Cyclam based systems. Grant Support: Research Corporation CC6505 (TJH); NIH Grant P20 RR016478 (TJH); Yorkshire Cancer Research YBC157 (SJA); Yorkshire Concept Fund EBC012 (SJA)

12. **Unsubstituted Linked Cross-Bridged Tetrazamacrocycles**. Josh T. Priddle (Dr. Timothy J. Hubin) Department of Chemistry and Physics

    Linked Tetraazamacrocycles have become important as potential CXCR4 chemokine receptor antagonists. The FDA recently approved the first such drug molecule "Plerixafor" for use in stem-cell transplantation. Our research group has been synthesizing analogues to this drug wherein the configuration of the molecule is controlled by bridging the macrocycle and complexing it to a transition metal. The synthesis of our ligands has previously required alkylation of all of the nitrogen atoms, limiting the amount of Hydrogen Bonding that is possible in interacting with CXCR4. This presentation details a protection/deprotection synthetic scheme utilizing an allyl protecting group to yield one unsubstituted nitrogen per macrocycle. Our expectation is that Hydrogen Bonding will improve, perhaps giving stronger binding to CXCR4.

13. **Development in Potential Anti-HIV & Antimetastatic Drug: C3-Symmetric Tris-Linked Bridged Tetraazamacrocycles as Potential CXCR4 Antagonists.** Courtney D. Garcia (Dr. Timothy J. Hubin) Department of Chemistry and Physics

    This SWOSU-Hull collaboration has produced well over 50 metal complexes of bis-tetraazamacrocycle ligands for screening as CXCR4 antagonists. The bis-linked complexes are highly efficient antagonists, while single-macrocycle analogues are much less effective. Our objectives were to synthesize C3-symmetric tris-linked analogues of our most effective bis-tetraazamacrocycle metal complexes and to characterize their chemical and physical properties in preparation for determining if the added macrocycle enhances their antagonism of CXCR4. Funding was provided by Research Corporation (CC6505); the Oklahoma State Regents for Higher Education; and NIH Grant P20 RR016478 from the INBRE Program of the National Center for Research Resources.

14. **Potential CXCR4/CCR5 Antagonists from Bridged Tetraazamacrocycle Transition Metal Complexes.** Katherine L. Coats (Dr. Timothy J. Hubin) Department of Chemistry and Physics

    The newly approved drug Plerixafor is a CXCR4 chemokine receptor antagonist based on linked tetraazamacrocycles. Recently, interest has increased in making antagonists that are effective against multiple chemokine receptors. CCR5 is a chemokine receptor, that like CXCR4, is a known co-receptor for the entry of HIV in to human cells. Antagonists effective against both might be useful anti-HIV agents. We present the synthesis and characterization of bridged tetraazamacrocycles containing a 2,5-dichloropyridine pendant arm. This pharmacophore has demonstrated activity against CCR5. The intention is that the combination of these two known pharmacophores will result in antagonism towards both CXCR4 and CCR5.

15. **Complex I Inhibition by Flex-Het Anticancer Drugs Does Not Involve Inhibition of NADH Oxidase Activity.** Monte Stone (Dr. William Kelly) Department of Chemistry and Physics

Objective: Flexible heteroarotinoids (Flex-Hets), a novel class of retinoid anti-cancer drug, induce apoptosis in multiple types of cancer cells. The lead Flex-Het, SHetA2, is also a powerful inhibitor of NADH:Ubiquinone oxidoreductase in bovine heart muscle submitochondrial particles (SMP's). Recent efforts in our laboratory suggest that SHetA2 is an uncompetitive inhibitor of ubiquinone reduction, probably via indiscriminate binding in the hydrophobic membrane bound region. However, inhibition of NADH oxidase activity (partial Complex I activity) could not be ruled out. By employing potassium ferricyanide (K3FeCN6) , a reagent know to intercept electrons between the NADH oxidation site and the first Iron-sulfur site in Complex I, we can probe the effect of Flex-Het drug directly on the NADH oxidase sight independently of the Ubiquinone reductase site Methods: The effect of drug on NADH Oxidase activity was assessed using SMP isolated from bovine heart muscle mitochondria. NADH Oxidase activity was assayed spectrophotometrically using the decrease in absorbance of K3FeCN6 following the addition of NADH and in the presence of various amounts of inhibitors. A second set of experiments measured the Michaelis Menten parameters Vmax and Km for NADH oxidase activity in the presence of various amounts of inhibitors. Results: Flex-Hets are not inhibitors of NADH oxidase activity. Addition of up to 30 microM SHetA2 do not affect NADH Activity as measured by the K3FeCN6 method.

16. **Role of "Oxyanion Loop" Dynamics in Active Site Synchronization within CTP Synthetase**. Ellen F. Ferrell (Dr. Jason L. Johnson) Department of Chemistry and Physics

    CTP synthetase (CTPS) catalyzes the production of CTP to support nucleic acid and phospholipid synthesis, and is thus a target of drugs in the control of many cancers. Its reaction mechanism involves the hydrolysis of glutamine to release ammonia from one active site, followed by the transfer and reaction of the ammonia with an acceptor substrate in a second active site. Glutamine hydrolysis involves a nucleophilic attack by C379 on the delta-carbonyl group of glutamine to form a reactive thioester intermediate. G352, contained within a flexible loop structure, contributes to the formation of an "oxyanion hole" to stabilize via H-bonding the tetrahedral intermediates inherent to this mechanism. One hypothesis whereby the activator GTP and/or substrate nucleotides stimulate glutaminase (GATase) activity is CTPS is via allosteric rearrangements of this "oxyanion loop". Direct evidence for the "oxyanion loop" mechanism, however, is lacking. Our approach is to conservatively introduce a tryptophan probe into the "oxyanion loop" of CTPS, previously engineered to be tryptophan-free. Changes in the fluorescence emission spectra, lifetime, steady-state / dynamic anisotropy, and exposure to quenching of each probe will serve as descriptors of conformational change induced by the binding of all combinations of substrates, products, and effectors. We have targeted Y355W to serve as the probe. This position is central to the "oxyanion loop", is not conserved, and is thus likely to be stably substituted. The method of site-directed mutagenesis to position this probe is presented here. Ultimately, understanding explicitly how glutaminase activity is stimulated within CTPS might likewise provide the opportunity for the rational design of analogs to selectively inhibit it. Funding provided by Oklahoma State Regents Grant.

17. **Deconstructing the Collective Fluorescence Responsiveness of Cytidine-5'-Triphosphate Synthetase.** Kayla Wallis and Jonathan Walker (Dr. Jason L. Johnson) Department of Chemistry and Physics

    Proteins within the Glutamine Amidotransferase Family (GATs) catalyze the hydrolysis of glutamine and synchronized transfer of nascent ammonia to an acceptor-substrate in a separate domain during the synthesis of nitrogen-containing compounds. We seek to elucidate the allosteric mechanisms directing such active site synchronization within the GATs by focusing on the example enzyme CTP synthetase (CTPS). CTPS defines intracellular levels of CTP, is consequently an important antineoplastic target, and is activated in its GATase activity via the binding of the allosteric effector GTP and its nucleotide substrates ATP and UTP. Our method is to evaluate changes in the fluorescence properties of tryptophan residues in response to the binding of substrates, products, and allosteric effectors. The dynamic, fluorescence properties of each probe will be sensitive to and descriptive of the subtle perturbations that have thus far eluded structural studies, and a systematic evaluation of all possible combinations of substrates, products, and allosteric effectors will provide details on the specific combination of molecules contributing to the stimulation of the coordinating signal. Preliminary studies have identified a complex matrix of ligand-induced changes in the collective fluorescence properties of CTPS's three native tryptophans. However, it is impossible to determine directly which individual or combination of tryptophans contributes to any given response. We have therefore genetically engineered protein variants in which each contains only one of the native tryptophans, with the remaining substituted with tyrosines. The responsiveness of each isolated probe to the binding of ligands will identify which of the many hypothesized modes of inter-domain communication are being reported via native fluorescence, perhaps

revealing unique structural targets for CTPS's pharmaceutical control. Funding provided by Oklahoma State Regents Grant.

18. **My Baby Drinks a Genetically Modified Soy-Based Formula**. Huy Do and Steven Bozell (Dr. Muatasem Ubeidat) Department of Biological Sciences

    Genetically modified plants (GM) are plants with foreign genes added to them to give rise to a new phenotype. This phenotype is either to increase the content of certain biological molecule or to make the plant resistance to pests. The most common methods for detection of genetically modified plants in food samples are PCR and ELISA. In this study we used PCR to detect the cauliflower mosaic virus (CaMV) 35S and the Agrobacterium tumefaciens nopaline synthase (nos) promoter. These promoters are widely used in genetic modifications of most GM crops in the United States. The soy-based baby formulas were obtained from local supermarkets or department stores and tested for the presence of these promoters. Three PCR reactions were performed for each food sample, one to detect viable DNA and two to detect the promoters. We found that all soy based baby formulas contain the genetically modified soy. These items need to be labeled by the FDA as genetically modified because of the delicate immune system of the consumers.

19. **Characterization of Microbes Isolated from Beef Cow Quarters in September 2009**. Jessica Danielle Gross (Dr. Lisa Appeddu[1], Dr. Michael A. Brown[2], and Dr. David VonTungeln[2]) School of Allied Health Sciences[1] at Southwestern Oklahoma State University, USDA-ARA Grazinglands Research Laboratory[2], El Reno, OK

    The objectives of this research are to evaluate the types of microbes associated with mastitis and to screen for antibiotic susceptibility. This research is part of an on-going project being done in cooperation with the USDA-ARS Grazinglands Research Laboratory in El Reno, OK, and is funded in part by a College of Professional and Graduate Studies Faculty Research Grant. The individual quarters of thirty-eight beef cows were milked during late lactation in September 2009. Milk samples were plated on blood agar to detect the presence of and to isolate infective microbes. Identification of microbes is currently being done by staining for Gram reaction, observing culture appearance on differential media, running catalase and oxidase tests, determining coagulase reaction, and utilizing commercial kits for species names. Microbes also will be screened for susceptibility to antibiotics by use of a disk diffusion assay. Antibiotics to be tested include cetiofur (XNL), enroflaxacin (ENO), pirlimycin (PIR), trimethoprimsulfamethoxazole (SXT), penicillin (P), ampicillin (AMP), cephalothin (CF), erythromycin (E), gentamicin (CN), tetracycline (TE), cefoxitin (FOX) and oxacillin (OX). Results indicate 13 of 38 cows harbored microbes in at least one quarter, and preliminary identification suggests infective microbes were different species of Corynebacterium and Staphylococcus. Results will be used to evaluate the incidence of microbial infection, microbial types and effectiveness of antibiotic treatments in the beef cow herd.

20. **Physiological and Behavioral Traits of Fragile-X Mutant Fruit Flies (Drosophila melanogaster).** Melissa Peters, Pamela Moreno, Irene Lopez, and Whitney Wichert (Dr. Jimena Aracena) Department of Biological Sciences

    Physiological and behavioral traits of fragile-X mutant fruit flies (Drosophila melanogaster) Melissa N. Peters, Pamela Moreno, Irene Lopez, Whitney Wichert, and Jimena Aracena Studies of neurological disorders in mutant fruit flies (Drosophila melanogaster) can be applied to humans disorders. Fragile-X (dfxr) mutants have been used as a model organism at the molecular and cellular level to study neuronal circuits and synapses. The mutant flies show neurodegeneration similar to that encountered in human aging and autism. Our goal is to study the effects of the mutation at the organismal level by testing the dfxr flies' complex behaviors, such as feeding and foraging. These behaviors require decision-making, learning, memory, locomotory circuits, and complex integration of internal and external inputs in the central nervous system. Our preliminary results show that the dfxr mutants are generally healthy and capable of feeding and foraging on small patches of sugar-water in the laboratory. The flies survive starvation in the laboratory at similar levels as normal wildtype flies. However, the mutants show a tendency to groom significantly more than normal wildtype flies and spend significantly less time foraging for food. These flies also appear to have lower levels of locomotory activity and very reduced negative geotactic behavior.

21. **Analysis of Gene Expression Profiles Reveals that Major Sperm Proteins May be Involved in Synaptogenesis.** Kassandra Guthmueller and Dan Stefanovic (Dr. Andrea Holgado) Department of Biological Sciences

Synapses are composed of a presynaptic terminal associated with a postsynaptic terminal, the target cell to which the presynaptic terminal will pass its message. In the case of chemical synapses, messages are carried in neurotransmitters from presynaptic to postsynaptic terminal via exocytosis. Previous research in Caenorhabditis elegans suggests the VSM-1 protein is a negative regulator for exocytosis. VSM-1 mutants show increased synaptic activity, suggesting the wild-type protein inhibits exocytosis. In order to evaluate genetic expression profiles of wild-type and mutant VSM-1, a genome-wide microarray was performed on nematodes harvested at the larvae 4 (L4) stage. Analysis revealed an induction of many genes coding for members of the major sperm protein family (MSP). MSPs are the major component of sperm in C. elegans and appear to signal oocyte maturation and ovulation. Additionally, Chai and colleagues demonstrated that fruit flies' MSPs-like molecules regulate presynaptic bouton number and size at the neuromuscular junction. Moreover, analysis performed by Tsuda and coworkers suggested that MSPs may act as ligands for Eph receptors and trigger receptor tyrosine kinase signaling cascades. Based on our preliminary findings and published data, we hypothesized that C. elegans MSP may play a crucial role in synaptogenesis. To test this hypothesis, more microarray analysis will be performed, gene expression profiles from different developmental stages will be analyzed and MSP induction due to spermatogenesis or VSM-1 mutation will be evaluated.

22. **Examining the Effects of Lanthionine Ketimine Ester (LKE) at Nematodes' Synapses.** Erica Benda[1] and Tyler Hardin[1] (Dr. Andrea Holgado[1], Dr. Kenneth Hensley[2]) Department of Biological Sciences[1] at Southwestern Oklahoma State University, Department of Pathology[2] at the University of Toledo, Canada

    Lanthionine ketimine (LK) is a natural brain metabolite formed from sulfur amino acid metabolism. LK is generally considered metabolic waste, as no purpose has been demonstrated for this molecule until very recently. In recent proteomics studies, however, we find that LK binds brain proteins involved in cytoskeletal remodeling and presynaptic vesicle trafficking, including syntaxin binding protein-1 (STXBP1, MUNC-18). Accordingly, studies were initiated to test the effects of LK on presynaptic neurotransmission in a C. elegans model system. A cell-permeable LK-ester was administered to developing C. elegans which were subsequently analyzed for synaptic function via motor functional assays in the presence and absence of the cholinesterase inhibitor aldicarb. Wild type animals grown in the presence of LKE had normal release of ACh indicated by aldicarb sensitivity while animals overexpressing YFP in neurons and grown in the presence of LKE have reduced cholinergic release rate. Moreover, this phenotype was found to be mediated via UNC-18, a neuronal protein regulating synaptic vesicle exocytosis. These data suggest a possible function for LK as a paracrine substance regulating neurotransmission. Further analysis of LKE mode of action will be presented at the meeting.

23. **VSM-1 Overexpression Inhibits Synaptic Vessicle Formation**. Maggie Yoder and Angela Foust (Dr. Andrea Holgado) Department of Biological Sciences

    Intracellular membrane fusion is a fundamental mechanism employed by all eukaryotic cells for the controlled secretion of a great variety of substances. In the case of neurons, membrane fusion mediates the release of neurotransmitters and chemical communication. More specifically, during synaptic vesicle fusion, a vesicle-associated protein (v-SNARE) binds to proteins on the target membrane (t-SNAREs) forming a tight SDS resistant four-helical bundle called SNARE complex. VSM-1, the goal of our study, was recently identified as a v-SNARE interacting/inhibitory protein in yeast. Furthermore, analysis performed in our laboratory showed that overexpression of neuronal VSM-1 partially inhibits the release of acetylcholine at neuromuscular junctions. Mutations on this gene result in the opposite phenotype; enhanced synaptic vesicle fusion. Consequently, we hypothesize that VSM-1 functions at synapses limiting the formation of SNARE complexes and synaptic fusion events. To test this hypothesis, we engineered vsm-1 mutant animals that overexpressed neuronal VSM-1 fused to GFP. These animals were then used in tests for neurotransmitter release and protein-protein interactions. A progress report on this research will be presented at the meeting.

24. **Generating a Polyclonal Antibody to Study Membrane Fusion in Cells**. Dana Poling (Dr. Andrea Holgado) Department of Biological Sciences

    Exocytosis is the process by which a cell directs the contents of secretory vesicles out of the cell. SNARE proteins that are located within the plasma membrane mediate this secretory process. We know that the protein VSM-1 (v-SNARE master protein 1) plays a role in exocytosis, but it is not known how or what the role of VSM-1 is. Our goal is to determine the molecular machinery of proteins underlying VSM-1 function. To this end, we first embarked in the process of generating a VSM-1 antibody . We made and purified a

recombinant VSM-1 protein to use as an antigen, which was then injected into guinea pigs. Months later, guinea pigs were bled to give us a raw serum that held a VSM-1 antibody. These raw sera were tested for immunoreactivity using western-blotting techniques. Recent results showed that guinea pigs immunized with the recombinant VSM-1 protein detect VSM-1::GFP from overexpressing lines. Our next step is to try the raw post-immunization bleed on whole mounted worms and examine the protein expression pattern. Data from this last experiment will be presented at the meeting.

25. **VSM-1 is a v-SNARE Master Protein that Limits Exocytosis**. Carissa Fischer and Melanie Graham (Dr. Andrea Holgado) Department of Biological Sciences

    Objective: Exocytosis is a fundamental mechanism employed by eukaryotic cells for the controlled secretion of substances. In the nervous system, exocytosis mediates synaptic vesicle fusion and neurotransmitter release from nerve terminals. The SNARE proteins play a central role in this process. Assembly of these proteins into a ternary SNARE complex is thought to be essential for vesicle fusion in vitro. Progress has been made in identifying the fusion machinery, but the mode of action of SNARE interacting proteins is controversial. Therefore, the focus of our project was to determine the role of C. elegans v-SNARE master protein 1 (VSM-1) in vesicle fusion at the synapse. Methods: Analysis of VSM-1 function in the organism and its role at the synapse was determined by characterizing the phenotype of vsm-1(ok1468) deletion mutants isolated by the C. elegans gene knockout consortium. This mutant synaptic phenotype was studied using behavioral, pharmacological, and cytoarchitectural assays. Results: First, we established that deletion of 820 nucleotides containing 5' regulatory sequences and nucleotides for exons 1-3 resulted in smaller mRNA for vsm-1. Second, quantitative analysis of vsm-1(ok1468) locomotion behavior showed that musculature performance is impaired in vsm-1(ok1468) mutants. Third, pharmacological assays demonstrate that vsm-1(ok1468) mutants have an increased sensitivity to "Aldicarb", a cholinesterase inhibitor. Lastly, immunological analysis showed that the synapses of vsm1-ok1468 had smaller but more numerous puncta than those in the wild type. Conclusions: These data suggest that C. elegans VSM-1, has an inhibitory role in vesicle exocytosis affecting synaptogenesis and/or synaptic transmission. Specifically, analyses of vsm-1(ok1468) mutants demonstrate that these animals have enhanced neurotransmission and increased density of presynaptic specializations.

26. **Evaluation of the Effects of Ethanol on Dissolution of Various Types of Modified Release Dosage Forms.** Michael Pilkington (Dr. Rahmat Talukder) Department of Pharmaceutical Sciences

    Objectives: In-vitro evaluation of effects of ethyl alcohol on dissolution behaviors of various types of controlled release dosage forms. Methods: Delayed release products, such as, Ecotrin® and Asacol® tablets, and prolonged drug release dosage forms, namely, Nifedipine ER tablets, Proranolol ER, Effexor® XR, and Pentasa® capsules were obtained from a local drug store. In-vitro evaluations of the dosage forms were conducted in 900 ml of USP simulated gastric fluid without the enzyme (SGF) and in SGF with different levels of ethyl alcohol (5%, 10%, and 20%) in a VanKel USP apparatus II at 50 rpm using on-line UV spectrophotometric detection. The non-disintegrated tablets were further evaluated in USP simulated intestinal fluid (SIF) without the enzyme. Results: Presence of 5% ethanol in dissolution media did not produce any significant difference in drug release as compared to that in SGF alone. The delayed release dosage forms, Ecotrin and Asacol tablets, did not exhibit significant change in their drug release behaviors due to the presence of 20% ethanol in the dissolution media. In the case of prolonged release dosage forms, e.g., propranolol ER and Effexor XR capsules, only about 2 % more drug release took place in the presence of ethanol than in SGF alone. Under the similar conditions, Nifedipine ER tablets, however, released about 4% more of their contents than in the SGF alone in four hours. This behavior is attributed to the higher solubility of the drug in ethanol than in aqueous media. For Pentasa capsule, on the other hand, the drug release was reduced by about 3% in presence of ethanol. Conclusions: Presence of alcohol in dissolution media may impair the drug release from a modified release dosage form. When the solubility of the active ingredient varies between aqueous and hydro-alcoholic media, significant increase or decrease in drug release is possible in the presence of higher level of alcohol. Thus, the drug release from Nifedipine SR tablets was increased while the release from Pentasa capsule was decreased in the presence of alcohol.

27. **Campus Tree Map.** Kelsey Zybach (Dr. R. W. Seibert and Dr. Ric Baugher) Department of Biological Sciences and Department of Industrial and Engineering Technology

    The Campus Tree Map has been an ongoing project involving updating the maps of the Weatherford and Sayre campuses, the SWOSU Athletic Complex at Weatherford, and Crowder Lake. These maps show the location of every tree along with their common and scientific name. To date there are over 70 different

kinds of trees located on the maps. As well, memorial trees are marked by an orange dot on the map and a description of them is located in the map legend. Along with the maps on display is a previous edition Campus Tree Finder pamphlet. A new pamphlet is to be published this semester and will include the entire Weatherford campus broken into manageable segments. This pamphlet can be used by students, alumni, and visitors to aid in finding and enjoying the wide variety of trees on campus as well as allowing them to see first-hand the many different species of trees that can grow in Western Oklahoma. Also on display is an example of the blue tags that have been placed on strategic trees throughout the campus to aid with identifying the trees and to be used as a learning tool for students taking biological and science based classes. They have been installed using stainless steel screws to protect the trees from any damage and use rubber stoppers to hold the blue tags in place.

28. **Predicted Enjoyability of Violent Games by Sex and Age of Player**. Natalie James, Caleb Scoville, and Janet Vasquez (Dr. Stephen Burgess and Dr. Melinda Burgess) Department of Psychology

    The effects of playing video games include positive outcomes such as increased spatial skills (e.g., Feng, Spence, & Pratt, 2007). Unfortunately, the effects of playing video games, especially violent video games, have received the most research attention with a growing consensus that they increase violent behaviors and thoughts while desensitizing players to violence (Anderson et al., 2009). Stereotypically, more males play violent video games. However, the trend is that more and more females are also playing video games, including violent video games, with greater frequency and at younger ages (Gentile, 2007). In the present study we examined how male and female college students rated the expected enjoyability of playing violent video games for male and female players of different ages. 200 students rated one set of covers for how much they expected a male and a female who was 3-6, 7-9, 10-12, 13-15, 16-18, and over 18 to enjoy the game (rating scale 1-6 not at all to very much). As expected, males rated the violent video games as more enjoyable for males of all ages. However, males also rated the violent video games as enjoyable for most females from a relatively early age. Females, although they rated the violent games as unenjoyable for younger females, also rated the violent games as enjoyable for most females. These findings indicate that violent video games are perceived as enjoyable by both males and females. Implications for exposure of children and teens to violent video games will be discussed.

29. **Playing of Violent Video Games and School Performance Among College Students.** Brittany Stewart, Natalie James, and Caleb Scoville (Dr. Stephen Burgess and Dr. Melinda Burgess) Department of Psychology

    Increased exposure to violent video game playing may disrupt school performance by increasing aggressive behavior (Anderson & Dill, 2000). For example, there is a negative correlation between average high school grades and violent video game exposure (Gentile, Lynch, Linder, & Walsh, 2004). One possibility is that exposure to violence in video games increases aggressive thoughts, aggressive behavior, and angry feelings among players (Gentile et al., 2004; Swing et al., 2209) who may become more likely to engage in hostile interactions with peers and authority figures such as teachers (Gentile et al., 2004; Swing & Anderson, 2007). These interactions could result in lower school attendance, increased suspensions, and poorer interactions with peers and teachers. Interestingly, violent video games are among the most popular for both males and females (Funk, Buchman, & Germann, 2000), but a greater percentage of males still prefer violent games (Hartmann & Klimmt, 2006). Very little research has examined these relations in college students. Six hundred seventy one participants (391 females) completed the survey materials. Eight of the ten questions pertaining to violence and video games were significant in the overall sample. Violent video game playing was significantly associated with college academic performance in our sample for the males only. This result remained even when controlling for overall experience with video games (i.e., playing of non-violent video games). Implications for these findings will be discussed in the context of an increasing acceptance of violent video game media by males and females.

30. **Perceptions of Video Game Enjoyability for Males and Females of Different Ages**. Brittany Stewart, Natalie James, and Caleb Scoville (Dr. Stephen Burgess and Dr. Melinda Burgess) Department of Psychology

    Video game playing has become a multi-billion dollar industry worldwide. Historically, males were more likely to play video games, but now about 97% of American teens and 81% of those 18-29 play (Gentile, 2007). Little research has examined the factors associated with how certain games are perceived as enjoyable and how this might vary by sex and age of player. In the present study, we examined whether factors such game rating, presence of a female primary character, and sexuality presented on the cover

predicted how college students rated expected game enjoyability for males and females of different ages. 200 rated each cover for how much they expected a male and a female who was 3-6, 7-9, 10-12, 13-15, 16-18, and over 18 to enjoy the game (rating scale 1-6 not at all to very much). This study is one of the few attempts to examine factors associated with how video games are viewed by adults. Males were very likely to view video games as enjoyable for both males and females from a young age. Females viewed video games as enjoyable for males from an early age and for females in the teens. Implications for stereotype development from exposure to sexualized and stereotyped portrayals of women and ethnic minorities will be discussed.

31. **College Student Remedial Status and the Use of Literacy for Academic and Leisure Pursuits.** Kari Watkins (Dr. Stephen Burgess) Department of Psychology

    Time spent reading is positively associated with better performance in school, higher scores on critical thinking and reasoning tests, and larger vocabularies (e.g., Guthrie, 2001). Therefore, those who do not engage in regular pleasure reading may be at a disadvantage because they may have difficulty developing reading and writing skills at a sufficient level to adequately complete the demands of today's world (Burgess & Jones, 2009). We examined the leisure and academic reading habits of college students to determine whether there were differences in the use of literacy materials by students with and without a history of reading difficulty. 350 college students completed a survey designed to assess literacy habits and reasons for not engaging in reading behaviors. As expected, remedial students were significantly less likely to engage in literacy behaviors for fun than non-remedial students, but these differences varied by format of literacy material. Remedial students were less likely to read a book or part of a book for fun. There were no differences between the groups in the use of other leisure print materials such as newspapers or magazines. In contrast to pleasure reading, there were no significant differences in the use of books for school or study purposes. For example, there were no differences in the reported use of textbooks for studying or preparing for quizzes. Implications of these findings for using popular sources as examples in class and for school assignments will be discussed.

32. **Microbes Got Money?** Caleb Bursey, Chelsea Dupus, and Kelly Moore (Dr. Lisa Appeddu) School of Allied Health Sciences

    Have you ever wondered how dirty your money actually is? The objectives of this research were to compare microbial load of dollar bills and coins, to compare microbial load of four different coins, and to compare microbial load based on the year the coin was produced. This research was done to meet the course requirements of ALHLT 3043 Health Statistics, and was funded by a College of Professional and Graduate Studies Faculty Research Grant. One dollar bills (n=10), pennies (n=10), nickels (n=10), dimes (n=10), and quarters (n=10) were swabbed to harvest microbes onto general media (Tryptic Soy Agar plates). After 48 hours at 30°C, resulting bacterial colonies were counted on plates. A trimmed mean was used in conducting statistical analysis to adjust for outliers. When comparing dollar bills and coins, we found dollar bills had significantly more bacterial colonies ($P<0.05$). We determined different types of coins had different ($P<0.05$) counts, but no significant difference ($P>0.05$) was observed when comparing "Old" versus "New" coins. Based on our results, we conclude that money can transfer microbes, and coin composition may be an important factor.

33. **Young Americans and Health Insurance**. Tyler Mattocks and Tera Cheaney (Dr. Lisa Appeddu) School of Allied Health Sciences

    The affordability and availability of health insurance and health care is a hot topic in the news today. The objectives of our research were to determine the proportion of SWOSU students who have health insurance and to relate insurance status to age, gender, ethnic origin, affordability, and annual health care costs. This research was done to meet the course requirements of ALHLT 3043 Health Statistics, and was funded by a College of Professional and Graduate Studies Faculty Research Grant. We conducted a survey using convenience sampling of 60 SWOSU students in Fall 2009. Overall, 53 out of 60 students surveyed had health insurance. We found no association between a person's age, gender, or ethnic origin with the likeliness to be insured. Parents/Guardians were the primary providers of health insurance for SWOSU students. The main reason students did not have insurance was due to cost. Most students (40%) paid less than $500 annually for health care; however, 36% of respondents did not know how much their bills were. Students without insurance did not pay more annually ($P>0.05$) than those having insurance coverage for health care. Overall, we determined that only a small proportion of SWOSU students surveyed were uninsured, because most students were still eligible under their parents'/guardians' health insurance policies.

34. **Is there a Difference Between Disinfectants and Disinfectant Cleaners?** Kimberly Nguyen, Casey Turner, and Dakota Brown (Dr. Lisa Appeddu) School of Allied Health Sciences

When the time comes for spring cleaning you want the best product that will get the dirt and microbes out of your house. The objective of this experiment was to determine whether there was a difference between the disinfectant, Swiffer®, and the disinfectant-cleaner, Pine-Sol®, in removing microbes from the floor of the Old Science Building. This research was done to meet the course requirements of ALHLT 3043 Health Statistics, and was funded by a College of Professional and Graduate Studies Faculty Research Grant. To test for a change in microbial load, we swabbed the floor before and after cleaning with Swiffer® and Pine-Sol® at six different locations within the Old Science Building. Swabs were spread onto a general media (Tryptic Soy Agar plates) and cultured at 30°C for 24 hours. We determined the resulting bacterial count before and after cleaning with each treatment at each location, and measures were repeated twice. While there was not a significant difference ($P>0.05$) in the before and after counts across locations, the elevator did have a numerically higher bacterial load. Due to this variation, we calculated percent reduction from microbial counts before and after cleaning to determine treatment effectiveness. Although Pine-sol® numerically reduced microbial load to a lower level, we found no statistical difference ($P>0.05$) when comparing percent reduction for Swiffer® (-87.51%) with Pine-Sol® (-91.14%). From our results, both cleaners appeared to be effective in reducing microbial load in highly travelled locations.

35. **Smoking: It'll Take Your Breath Away**. Alex Sherry (Dr. Lisa Appeddu) School of Allied Health Sciences

Although most of us are aware of the dangers of smoking, many young people seem to be under the impression that health disorders can happen to everyone else but them. Therefore, the objective of this research was to compare the lung capacities of SWOSU students who smoke versus who do not smoke. This research was done to meet the course requirements of ALHLT 3043 Health Statistics, and was funded by a College of Professional and Graduate Studies Faculty Research Grant. In Fall 2009, a survey was conducted through convenience sampling of 20 SWOSU students (5 smoking males/females and 5 nonsmoking males/females). Subjects completed and returned a questionnaire regarding age, gender, and daily smoking and exercise habits. The Tidal Volume (TV), which is the amount of air breathed in and out during normal respiration, and Vital Capacity (VC), which is the maximum amount of air that can be inhaled and exhaled, were determined in each subject using an electronic spirometer (Vernier Software & Technology). The TV of smoking students was numerically lower than nonsmoking students. Male smokers had a lower ($P<0.05$) VC than male nonsmokers; however, VC was numerically higher in females who smoked as compared to those who did not smoke. Students who exercised did not have higher VC measures as compared to those who did not exercise. Although sample size was small, results suggest smoking can negatively affect lung capacities in young people.

36. **Arsenic Toxicology and Exposure Effects: A Report from the Literature.** Dae Han Won (Dr. Sylvia Esjornson) Department of Chemistry and Physics

Arsenic is a common contaminant in rocks, soils and waters around the world. There are two forms of arsenic: inorganic and organic. U.S. Environmental Protection Agency (USEPA) recognized human health problems regarding Arsenic in the environment and amended the Safe Drinking Water Act in 1996. On January 23, 2001, the USEPA reduced the drinking water maximum contaminant level for arsenic from 50 parts per billion to 10 parts per billion. Many studies indicate that ingesting inorganic forms of arsenic (namely arsenic trioxide) can increase the risk of cancer: skin, liver, bladder and lungs. Other possible effects on our organ systems are cardiovascular, gastrointestinal, neurological, reproductive, and hematologic such as bone marrow depression. Urinary excretion of inorganic and organic forms of arsenic can be tested for recent exposure to arsenic. One of the most common methods to remove arsenic from water is coagulation. Oxidation/reduction, adsorption and ion exchange, solid/liquid separation, physical exclusion, and biological removal processes are also used for removal of arsenic in water.

37. **Synthesis and Uses of Fe(VI) Compounds in Water Treatment: A Report from the Literature.** Nathan Treadaway (Dr. Sylvia Esjornson) Department of Chemistry and Physics

Advancements in the synthesis and use of Fe(VI) have established it as a likely candidate for water treatment in the future. Today's conventional method of using chlorine to purify water is expected to have adverse effects on human health. To avoid these health risks, new ways of purifying water are being explored. Fe(VI) compounds, also known as super iron compounds are one of the more promising alternatives being researched. Studies have been conducted using different iron six containing

compounds in different forms and purities as well as at different pH to establish at what conditions these compounds are most effective at the task of water purification. Fe(VI) is an unusual form of iron with a high ability for oxidizing other compounds. These iron salts have been used in water and wastewater treatment and sludge treatment, as well as in the treatment of bio-solids, and have been shown to be useful in breaking down unwanted drugs and hormones that are hard to treat otherwise. In addition to this, these compounds of iron have coagulating properties that make its use even more beneficial by allowing the iron to be recovered after the reaction. Super iron salts may provide the water purification of the future if the cost of producing these compounds can be overcome. However, there is promise because research has been able to find the optimum pH and atmospheric conditions to produce many of these compounds.

38. **Removal of Pollutants from Wastewater with the Use of Immobilized Microalgae: A Report from the Literature.** Thomas Helt (Dr. Sylvia Esjornson) Department of Chemistry and Physics

    Most wastewaters are hazardous to human populations and the environment and must be treated before disposal into lakes, streams, seas, and land surfaces. An immobilized cell is defined as a living cell that, by natural or artificial means, is prevented from moving independently from its original location to all parts of an aqueous phase of a system. When immobilized microalgae are used to absorb contaminants, the cleaner water diffuses out and the polymer gel can be collected and reused in several more cycles. Polymers have effects on microalgae due to chemical forces and interactions between the immobilization matrix and the cell wall. Pollutants to be removed, such as nitrogenous compounds, are turned to a biomass along with oxidation of ammonium to nitrate, nitrite, and nitrogen, which evaporates into the atmosphere. Phosphorus containing compounds are removed by chemical precipitation with iron, aluminum, or lime. Metal ions are usually removed when precipitated out by chemicals that change the pollutant from aqueous to solid phase. The advantages to cleanup of wastewater with microalgae are that it is protected and controlled within the polymer, a mix of different microalgae can be used to treat wastewater, and it has a better plasmid stability and so may be designed for specific cleaning purposes. The drawbacks are limited technical knowledge, so cost is high, and some contaminants are hard to remove so a greater amount of time is required.

39. **Drinking Water as an Underground Pharmacy: A Report from the Literature.** Whitney Finch (Dr. Sylvia Esjornson) Department of Chemistry and Physics

    A disturbing number of pharmaceuticals, personal care products and illicit drugs have been detected in surface water, ground water, sewage, and drinking water in the U.S. and the rest of the world, which indicates their inefficient removal during conventional water treatment processes. More specifically, endocrine disruptors, antibiotics, hormones, antimicrobials/antibacterials and herbicides/pesticides in drinking water create new problems that have raised many questions concerning the potential adverse effect on the environment and public health. Another important question being asked concerns which treatment processes are most effective at removing these once ignored chemicals. Researchers have related pharmaceuticals in surface water to undesirable effects on aquatic life, but information of the potential risk, if any, on humans is inconclusive. The name and source of these pharmaceutical contaminants and the effective treatment options, the potential adverse effect on the environment and public health, as well as the use of sewer epidemiology are reported.

40. **Industrial Water Demand: A Report from the Literature.** Cody Gragg (Dr. Sylvia Esjornson) Department of Chemistry and Physics

    Industries account for a significant amount of the total world water consumption and will continue to use more water with more countries industrializing. Industrial water use includes water used to manufacture products such as steel, chemicals, and paper, as well as water used in petroleum and metals refining. Industries also use water for process and production water, boiler feed, air conditioning, cooling, sanitation, washing, transport of materials, and steam generation. Industrial water demand data has been gathered by questionnaires in less industrialized countries. In the U.S. there are regulations requiring industries to report the amount of water they use. Estimating water demand is essential in industrial water management and must follow the system water balance equation. The cost function of the industrial water use system equation decides how much reuse and recycling of water can be affordable. The paper making industry is a leader in using significant amounts of water to make products. In the U.S., power production plants use different types of generators that demand different amounts of water. Water network synthesis, inter-plant water integration, and a water reuse system in wetland paddy fields are strategies being used to reduce industrial water demand. The industrial water demand for energy and competing water use sectors consumes a considerable amount of water.

41. **China's Water Crisis: A Report from the Literature.** Ger Xiong (Dr. Sylvia Esjornson) Department of Chemistry and Physics

    One of the major problems facing China today is a shortage of water due to contamination and droughts. With the boom in industrial expansion, an enormous amount of waste gets into the water. For many years the river water in Zhenhe County, China, has been contaminated with cadmium caused by direct dumping of wastewater by mining factories into the rivers. The cadmium in the river has caused a lot of health issues to the residents living in Zhenhe County. With the water shortage and the increase in water demand in industries, Huabei Plain's agriculture suffers. Water shortages in many parts of China led to the authorities to take actions such as setting up quotas and charging people extra to conserve water. There is lots of pollution in China's water, but organic pollution is one of the greatest issues. In China only a small percentage of available water is good for drinking: about half of China's water is suitable for human use and the rest is not suitable for any usage. Lake Taihu is one of the five largest fresh water lakes in China, and it is heavily polluted. Lake Taihu is expected to be in less polluted condition according to "the ninth five-year plan" and the 2010 program. One alternative China is using to help solve their water shortage is using reclaimed water. Reclaimed water is not good for drinking but is still good for irrigation and other human uses. China is looking toward new ways of managing water to solve their water shortage problem.

42. **Adult Female Rape Victims: The Long Term Effects of Being Victimized by a Non-Family Male Perpetrator.** William Warren (Dr. Philip D. Holley) Department of Social Sciences

    Abstract: The poster will reveal how a woman is faced with a life-threatening situation called rape by a male who is a stranger. Rape is the crime of forcing another person to submit to sexual intercourse. This is a situation that she is sometimes unable to effectively resolve. Her usual methods of coping with threats and sometimes conducting interpersonal relationships fail her. Statistics show that one out of every six American women has been the victim of an attempted or completed rape in her lifetime. The poster will explain how women may experience severe long-term psychological effects. For an extended period of time following the rape, victims show signs of depression from lack of knowing how to deal with the incident, fear of a possible recurrence, or they may contemplate suicide because they don't feel they can effectively get over it.

43. **The Psychological Effects of Hate Crimes Against Gay Men.** Teresa Humphreys (Dr. Philip D. Holley) Department of Social Sciences

    This project focuses on psychological effects of hate crimes against gay men and what they endure. Hate crimes occur when a perpetrator targets a victim because of his perceived membership in a certain social group or sexual orientation; this includes being gay. This includes any crime of violence using physical force that is directed at gay men because of their sexuality. Since being gay is still seen by society as deviant, crimes against gay men are prevalent today. In 2003, statistics show that 38% of gay men admitted to having been physically attacked by a stranger. This project will deal with certain effects of hate crimes, including areas of major (1) depression that lead to fatigue, feelings of worthlessness and guilt, (2) fear that a stranger might attack them again and (3) suicidal thoughts or actions.

44. **How Bullying Affects Social Stability in School during Childhood and Adolescence.** Melissa Nichols (Dr. Philip D. Holley) Department of Social Sciences

    Bullying is an insistent behavior involving unwanted and negative actions towards others. It is present when one person possesses more power over another and uses it against them in a negative way. Bullying can be expressed in many forms and all are painful. They include anything from verbal abuse by degrading individuals, social exclusion from others, physical abuse by hitting, kicking, or spitting, racial abuse by degrading any race, and sexual abuse by forcing someone to do certain actions that are not tolerable. It is estimated that roughly 6 million youth in the United States today are either the targets of bullying or the bully themselves. This poster involves the impact of bullying between children in school. When children are bullied in school, it not only affects their grades, but instead of paying attention during class, fear causes them to worry about what they did to deserve to be bullied. Bullying may also lead children being unwilling to return to school because they are scared. When bullying in school gets bad enough, some kids fake sickness or make up excuses for not attending.

45. **The Effects of Internet Stalking on Social Networking Websites**. Winona Youngbird (Dr. Philip D.

Holley) Department of Social Sciences

Stalking is persistent, obsessive and unwanted contact between a person or a group and another person involving threats and/or causing fear. Stalking members of social networking websites is a serious form of online harassment. Being a member of Myspace or Facebook allows persons from anywhere in the world to have access to one's personal information and opens up the opportunity for harassment. However, most internet stalkers are former friends or intimate partners. Statistics show that 500,000 women and 185,000 men are stalked annually. Half of those are reported to the police. Internet stalking reports make up 25% of all stalking complaints filed. Certain psychological effects are experienced by an Internet stalking victim: (1) fear-that the perpetrator will contact the victim face-to-face, (2) self-blame- where the victim blames himself or herself for being victimized and (3) anxiety- the victim feels vulnerable and worries constantly about being victimized again.

46. **Psychological Effects of Female Rape Victims**. Allison Smith (Dr. Philip D. Holley) Department of Social Sciences

    Rape is not about sex. It is about the feeling of having power. Female victims often feel inferior to their offender during the rape, and as a result suffer psychologically. Rape is forced sexual intercourse, including vaginal or anal penetration. Penetration may be by a body part or an object. Rape is a common crime. In 2008 there were a total of 164,240 female victims nationwide. Among that total 102,950 had non-stranger offenders. Victims of rape suffer psychologically and have symptoms including depression and flashbacks. Depression is one of the most common effects of sexual assault. It is a psychological disorder that affects a person's mood, physical functioning, and social interaction. Depression becomes more than just feelings of sadness if the feelings last for more than two weeks. Flashbacks refer to memories of past trauma events as if they are currently taking place. Some flashbacks are short and not very powerful. Others are long and very powerful. Often the victim does not realize they are having a flashback. They may feel distant and faint.

47. **Cyberbullying of Adolescent Girls Resulting in Suicide**. Robin Edgar (Dr. Philip D. Holley) Department of Social Sciences

    Adolescent girls use texting, e-mail, and social networking sites like MySpace to stay connected to friends and maintain an active social life. While technology has been helpful in connecting people, it has also become an increasingly popular mode for bullying. With increased use of electronic devices comes increased chances and ways for young girls to be victimized. According to the National Crime Prevention Center, over 40% of teens with internet access have reported being bullied online. The bullies are often known to the victim, but can also be strangers. Cyberbullying has been defined as willful and repeated harm inflicted through the medium of electronic text. Cyberbullying involves the use of communication and information technologies to inflict mental harm on others. Harm is exemplified by intimidation, fear, increase of suicidal thoughts, and low self-esteem. In some cases of cyberbullying, the situation escalates to the point where the person being victimized commits suicide. A recent study found that victims of cyberbullies are more than twice as likely to commit suicide than other teens. My focus will be on victimization resulting in depression and low self-esteem, which lead to suicide.

48. **Youth Gang Murder and its Effect on Families of the Victim**. Ryan J. McAdory (Dr. Philip D. Holley) Department of Social Sciences

    A recent study noted that approximately 1,335 gang related homicides occur annually in the United States. While there is an ongoing debate about what a gang is, it is generally accepted that a gang is a group of young people or adolescents who closely associate with one another often exclusively, and engage in deviant behavior. Homicide is the intentional death of a human being by another. The homicides perpetrated by adolescent gangs include both random and seemingly senseless murders that occur alongside premeditated murders. A random murder would include gang affiliated youth who kill without knowing the victim simply because they are in a rival gang. A premeditated murder would include retaliatory murders within a gang rivalry. This research presentation will explore how gang murder impacts the family of the victim. The effect of gang murder often perpetuates gang influence on the family, which can result in a continued cycle of killings. Gangs commonly permeate families providing for several generations of gang bangers. This can create an extremely damaged family structure, and an absence of male leadership.

49. **Extreme Consequences of Teenage Bullying in Junior High & High Schools**. Robert C. Kerbo (Dr.

Philip D. Holley) Department of Social Sciences

The poster is about the extreme consequences of bullying in school. Bullying is defined as repeated acts over time that involves an imbalance of power with the stronger individual abusing (for example, punching, spitting, and name calling) those who are less powerful. The power imbalance may be social power and/or physical power. The victim is sometimes referred to as a target. Psychological strain is a major consequence of bullying. It refers to the reactions that people have to excessive pressure or other types of demand placed on them. With such strain grades could drop. The poster deals with how bullying can push victims to such extremes as homicide or suicide. Suicide: Bullying has such an effect that victims feel like they can't escape so they take their own lives to end the pain and agony. In schools kids want to fit in and be accepted by their peers, so if nothing else works they remove themselves completely. Homicide: School bullying makes the target feel left out and embarrassed, so to stop the acts of aggression a teen could possibly take the life of the bullying teen to end the oppression. When pushed so far there is little else to turn to but to eliminate the wrong doers.

50. **Why Women Can't Get Out of an Abusive Dating Relationship with Men**. Laci Jo Vianco (Dr. Philip D. Holley) Department of Social Sciences

A dating relationship describes two people of the opposite sex who casually or romantically participate in various movies, dinner, lunch, or other activities. Despite the fact that dating relationships are fun, many of them can become abusive. Once they become abusive, it is difficult for the women to get out. Statistics estimate that 1 in 3 young women have been involved in some sort of abusive dating relationship. One in 4 women have admitted to being pressured into sexual activities by a partner. Roughly 10% of young women have reported physical abuse by a romantic partner. Nearly 80% of women involved in abusive relationships stay with their partner, and 30% of deaths of women between ages 15-19 were caused by their boyfriends. This presentation will describe five of many reasons why women stay in abusive relationships: 1) Survival/fear: they fear for their lives and his; 2) Economic dependence: they are not stable enough to get by on one income, or are too afraid to try; 3) Low self-esteem: she has been told things such as "you are nothing without me"; 4) Embarrassment/denial: she does not want anyone to find out and she denies the obvious; and 5) Identity/love: she loves him and feels incomplete without a man.

51. **Sibling "Rivalry Rage": The Long Term Effects on the Afflicted Siblings.** Shannon L. Margerum (Dr. Philip D. Holley) Department of Social Sciences

Sibling "Rivalry Rage" describes physical violence, including lacerations, bruising, bleeding, and/or the need for physician attention, and mental violence. These violent acts involve brothers and/or sisters, and occur after circumstances of jealousy, competition, or physical /emotional hurt caused by their siblings. Victimization occurs during and after sibling rage between the siblings is disregarded by society, leading to the inability of the children to deal with their emotions and heightening the degree of physical and emotional aggression in the future. Contemporary society views the sibling aggression as, "something kids do, they will grow out of it", or "kids will be kids". A study conducted in 1980 showed that "53 out of every 100 children in the United States are violently attacked each year." Although some question these findings, these attacks would be considered an assault if they had occurred outside the family. This poster deals with the long-term effects on the sibling's psychological impairment, once turning to adult age. The psychological impairment includes depression and explosive anger. The depression causes the victimized sibling to withdrawal from their normal day-to-day activities, including sports, time with friends, and ability to keep a job. The sibling also experiences explosive anger, causing the sibling to act out violently toward the self and others.

52. **Drugs, Date Rape, and College Women**. Reanna Barker (Dr. Philip D. Holley) Department of Social Sciences

Abstract -Date Rape occurs when two people "go out" and one forces sex upon the other. College women suffer because they meet people by going to parties, agreeing to dates at restaurants, and talking to people at bars where a drug can easily be slipped into a woman's drink without her noticing. The result of these situations is sometimes date rape, when a college woman is drugged and then raped. -A study of 32 college in the US showed that rape or attempted rape has happened to 1 in 4 women. -There are many drugs, such a Rohypnol and Ketamine, which are used to commit date rape. They tend to be odorless, tasteless, and difficult to detect when in drinks or mixed with other drugs. -There tends to be communication issues between males and females, and at times, the males manipulate females because the woman says "no" when the answer they wanted was "yes." -The focus of this poster is to show the link

between drugs and college women who are victims of date rape. They are constantly in dangerous situations when meeting new people and it is in these situations that drugs are used on college women to commit date rape.

53. **Female Victims of Sexual Exploitation in Europe.** James Ratliff (Dr. Philip D. Holley) Department of Social Sciences

    Female sexual exploitation trafficking refers to the recruitment, harboring, and transnational movement of young girls and women through the use of force, fraud, coercion, or deception for the express purpose of enslavement and sexual exploitation to gain a profit. Western Europe sees nearly 700,000 women trafficked in its borders annually. Of these women, large numbers are trafficked from impoverished Eastern European countries to Western Europe. Women from many parts of Africa, such as Nigeria, are also trafficked into this region. The presentation focuses on the sexual exploitation of females who are trafficked in Europe. This involves such victimization as confinement, torture, and forced sexual abuse, including rape. Many of these Western European countries do not have legislation that bans prostitution. Because of this, trafficking of women to these areas has not been hindered by any legal means.

54. **Criminal Victimization: The Effects of Being Burglarized**. Keith Richardson, Jr. (Dr. Philip D. Holley) Department of Social Sciences

    The poster that I will be presenting will explain the Effects of being a victim of burglary which is a felony of breaking into and entering the house of another with intent to steal. The effects of burglary are typically psychological disorders. One or two weeks after the crime, Victims are more anxious, hostile, depressed, tired, and confused. Female victims are scared to be home alone in their houses for weeks. The poster will also reveal the most commonly Effected which will include the elderly and people in low socially economic areas. In 2005, an estimated 2,154,126 burglary offenses occurred in the United States, 65.8 percent were residential structures, and 62.4 percent of burglaries occurred during the daytime hours. Property crime makes up slightly more than three-quarters of all crime in the United States. Among burglaries of nonresidential structures when time of occurrence was known, 58.0 percent occurred at night. Overall in about 84 percent of all burglaries, the offender gained entry into the victim's residence or other building on the property.

55. **The Effects of Being a Victim in a Home Burglary**. Brooke Landes (Dr. Philip D. Holley) Department of Social Sciences

    A home burglary occurs when a person enters a home with the purpose of committing a crime therein. It is estimated that a burglary takes place every 12 seconds; this accounts for an average loss of $1,675 per burglary. When a family becomes the victim of a home burglary, it is likely they will experience a change in their emotions, security practices, and have more noticeable fear of their surroundings. The poster deals with these changes. A family will suffer from emotional stress due to the burglary. It is common for a family to feel anger, fear, guilt or grief and experience various mood swings among the different emotions. A family will develop new security practices to incorporate in their ways of life. These new security practices could include installing an alarm system or buying a safe for their possessions. Often a family will experience a new sense of caution as a long term effect of a home burglary. The family will be much more aware of their surroundings. Some families install baby monitors into their garage to help reassure them that no one is inside.

56. **The Long-Term Behavioral Effects of Child Molestation on Pre-Teen Females.** Travis McLemore (Dr. Philip D. Holley) Department of Social Sciences

    This presentation discusses the long-term behavioral effects of child molestation on pre-teen females. Child molestation occurs when an adult performs lewd and lascivious acts with a child below the age of 16. Asking or pressuring a child to engage in sexual activities, indecently exposing genitalia to a child, and actual sexual contact are considered child molestation. Statistics show at least three million children are molested before they reach the age of 13. The presentation will explore long-term behavioral issues resulting from child molestation including stigmatization, which results in self-destructive behavior. Isolation from family and friends and acts of aggression towards others also result.

57. **Mommy, Baby, and Music: The Effects of Music Therapy Protocol on the Mother-Child Bond.** Tiffany Romasanta (Dr. Sophia Lee) Department of Music

This undergraduate research project is a study to see if music therapy protocol can help increase the bond between mother and child through increasing breast feeding duration, breast feeding education, and the decreasing the mother's stress level. Participants will be mothers of new born infants, possibly attending a mother-infant bonding class held at a local hospital. Approximately 30 mothers are hoped to participate. Mothers must be 18 years or older and have an infant of 6 months or less. Each mother will be randomly assigned to a group: the control group or the experimental group. Those in the control group will be asked to attend a Mommy and Baby class once a week for approximately 6 weeks, each session should last approximately 30 minutes. In this class we will be covering breast feeding education and the mother-child relationship. Mothers assigned to the experimental group will also be asked to participate in the Mommy and Baby class once a week as well. However, In addition to this class, we will be covering the same three areas (breast feeding education, relaxation, and mother-child relationship) but using music activities. These include activities such as singing play songs and lullabies and music with gentle movements, music techniques for relaxation, and music games for breast feeding education and discussion. There will also be an optional songwriting opportunity in which we, the researchers, will help mothers compose their own song for your infant on an individual basis.

58. **The Meaning of Roman Art**. Sara Christoff and Michael Miller (Mr. Todd Parker) Department of Art

Roman culture represents a rich foundation of Western civilization. Roman law, organization, and cultural forms shaped the West for millennia. Rome absorbed many regions of the ancient world and ultimately served as a Western bureaucratic vehicle for the Eastern religion of Christianity.

Art served to inform Roman citizens about social, administrative, governmental, and religious matters during ancient, medieval, and modern periods. What iconography is associated with the incorporation of the multiple cultures found in the Roman Empire during these periods? What did Romans use to decorate their respective urban areas? What influenced a Roman fresco painting in a private domus from the classical period? What influenced a Roman church during the Renaissance period?

This presentation will illustrate the means by which Roman artists transmitted important content common to the citizens of distinct time periods, particularly antiquity and the Renaissance.

Podium Presentations

59. **Remember the Ladies**. Jessica Pool (Dr. Viki Craig) Department of Language and Literature

12:30PM

Women in the early days of America obviously did not have the same political, educational, or expressive opportunities as modern women. They depended on their husbands or fathers to take care of them, provide for them, and speak for them, and were expected to submit to the men in their lives. Even so, some women of this period, like Abigail Adams and Sarah Kemble Knight, stood up on behalf of their sex and made a point, whether by their words or behavior, that went against the expectations of their day. These women, whether consciously or otherwise, acted as precursors of the women's rights movement and set examples of feminine strength by defying their suppressors.

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