



# ***Poster***

# ***Abstracts***

17<sup>th</sup> Annual Research Symposium

February 22 – 24, 2006

Oklahoma State University

*February 20 - 24, 2006*



## **Colonialism Throughout History: in the Caribbean Islands During 15th century and in Contemporary Iraq**

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**Presentation Subject Area: Social Sciences**

Colonialism is a living and breathing beast that still exists today. It has always been associated with the extraction of wealth from the provinces for the benefit of the center (Mahajan 102). Although not visible, colonization nonetheless has been practiced continually throughout history. In this research I intend to analyze the process of colonizing that took place in the Caribbean Islands in the late fifteenth century and compare that to the present day colonialism in Iraq. The invasion of the Caribbean Islands by Columbus and his crew jumpstarted a new type of economic system where European or Western nations play a leading role. Even today, the presence of colonialism is evident in Iraq. I believe that Colonialism of the 15th century very much resembles colonialism that is taking place today in terms of its nature, rationalization and methods of carrying it out.

## **Effects of Vitamin E Supplementation on Bone Quality**

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**Presentation Subject Area: Biological Sciences**

Vitamin E is commonly known to function as an antioxidant. However, little research has been done to discover the effects that Vitamin E might have on bone quality. In this experiment, thirty-two rats were randomly assigned to four treatment groups. Eight rats were sham operated and 24 were orchidectomized. The groups were: control (SHAM), orchidectomy (ORX), low dose supplemental vitamin E of 65.6 mg/kg diet (ORX+LD), or high dose vitamin E of 656 mg/kg diet (ORX+HD). After four months of feeding, rats were necropsied and bones were isolated and frozen. Micro architecture of the 4th lumbar vertebra (L4) was analyzed using a 'CT 40 scanner. The vertebrae were scanned from growth plate to growth plate at 16.5 micron intervals, and trabecular areas were contoured to define the volume of interest. Orchidectomy significantly reduced bone volume fraction, trabecular number and connectivity density, and increased trabecular separation. Micro architecture of the ORX+LD group did not differ significantly from the ORX group. Bone volume fraction (%) of the ORX+HD group tended to be lower than the ORX group (15.4 ± 0.6 vs. 18.5 ± 1.3, p=0.11) and trabecular thickness was significantly reduced in the ORX+HD group. Bone strength was estimated using finite element analyses. Compared to SHAM, the ORX group required significantly less force for compression and demonstrated decreased stiffness and size independent stiffness and increased von Mises stresses. Strength predictions for the ORX+LD dose did not differ from the ORX group. Von Mises stresses were significantly increased in the ORX+HD group compared to the ORX group. The changes in bone with ORX demonstrate the importance of testosterone or its metabolites in maintenance of bone quality. The high dose Vitamin E (ORX+HD) had detrimental effects on the micro architecture and predicted stress with load of the L4 vertebra, suggesting reduced bone quality. (Supported by the Niblack Scholars Fund, USDA-IFAFS-2001-52102-11257, USDA-2001-34402-10543, and Oklahoma Agricultural Experiment Station.)

## **Bam35 Major Coat Protein P3: Confirming a Viral Lineage**

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**Presentation Subject Area: Biological Sciences**

The Tectiviridae family of viruses is comprised of dsDNA icosahedral bacteriophages. It includes PRD1, which infect Gram-negative hosts, and Bam35, which infect Gram-positive hosts. These two exhibit closeness in virion and genome organization, but differ in sequence similarity. There is evidence that the major coat protein (P3) of Bam35 is analogous in structure to that of PRD1. The known structure of PRD1's major coat protein also showed strong similarities to those of Adenoviridae, Phycodnaviridae, and Iridoviridae, which all infect eukaryotic hosts, and that of Sulfolobus Turreted Icosahedral Virus (STIV), an archaeal virus. Hence, despite the variances between Bam35 and PRD1 and the other viral families, the closeness of the structures lead to and continue to support that all the viruses descend along the same lineage, arising from a common ancestor.

To confirm this relationship, the P3 protein is over-expressed and purified. The protein has crystallized under a few select conditions, which are being optimized. Resulting crystals are placed on a diffractometer and analyzed by X-ray diffraction. One crystal has diffracted to 3.5Å resolution. The space group is orthorhombic  $P2_12_12_1$  with cell dimensions  $a=128.04\text{Å}$ ,  $b=146.44\text{Å}$ ,  $c=168.42\text{Å}$ . The data collected can aid in ultimately yielding a structure of the major coat protein of Bam35, which can be compared to the other known structures of this proposed viral lineage.

## **The Effects of an Organic Light Emitting Diode with Regards to the Photoluminescence and Electroluminescence when Various Substituent Groups are Substituted on an Organic Polymer System**

**Steven Brown**

**McNair Scholars Program from Harding University**

**Presentation Subject Area: Physical Sciences & Technology**

Organic light emitting diodes are being developed for use in display devices and other emerging technology. Current research is focused on developing a polymeric system that emits blue light during electroluminescence. Towards that end, we are investigating the effect of various substituent groups on the emission frequency of a polymeric system. We have synthesized the precursor for a library of compounds to use as representative molecules for polymeric organic light emitting diodes.

## **Federal Indian Boarding Schools: Effects on Native American Cultural Identity**

**Benjamin Bushyhead-John**

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**Presentation Subject Area: Social Sciences**

The Native American boarding school experience is not an occurrence of the past. The legacy of a century of forced residential schooling includes a variety of societal ills and individual and family dysfunctions, (Chavez, 1999; Metcalf, 1976). Based on prior research it is realistic to assume that the cultural identity and participation in cultural events of Indian students attending these boarding schools today would be adversely affected. But due to the adaptability of Indian culture and the Indians students themselves, this does not seem to be the case.

This study investigates whether Indian students attending federal boarding schools would actually participate more frequently in cultural events and have a stronger cultural identity than Indian students who attend a tribally operated reservation school. To test this, hypothesis 16 boarding school students and 77 reservation high school students were asked to complete Garrett's Native American Acculturation Scale. The overall mean scores, as well as the mean scores of individual questions, were determined for each group and compared against each other.

Although the comparison of overall mean scores did not provide support for the main hypothesis, the mean scores of the selected individual questions did show that students attending the Indian boarding school did tend to participate more in cultural events than students attending a reservation high school.

## **Development of an Attract-and-Kill Formulation to Control the Indianmeal Moth, *Plodia interpunctella* Hübner (Lepidoptera: Pyralidae) in Commercial Establishments**

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**Presentation Subject Area: Biological Sciences**

The Indianmeal moth (IMM), *Plodia interpunctella* Hübner, causes severe damage to stored food products and its contamination is detracting to consumers; the impact is estimated at millions of dollars a year in lost product and control costs. Current controls include fumigation, fogging of spaces and application of residual insecticides, but broad scale use of chemical insecticides poses risks to public health and market value. We pursued a reduced-risk alternative, which is the combination of the female sex pheromone with a small amount of insecticide, the so-called attract-and-kill method, to control IMM in commercial establishments. Initially, thirteen insecticides registered for pest control were tested by contact toxicity tests. Three Pyrethroid products, *Cyfluthrin*, *Deltamethrin* and *Permethrin*, and natural Pyrethrins, organically compliant Pyrethrin and Pyrethrin combined with a synthetic synergist, caused over 70% of mortality on IMM adult males. Three delivery devices, a gel-like paste, a wax panel impregnated with pheromone and insecticide, and a 3-dimensional device, were tested with different doses of Permethrin, Cyfluthrin and organic Pyrethrin, and mixed or deployed with a lure containing female sex pheromone (Z,E)-9,12-tetradecadienyl acetate (ZETA). These devices were evaluated in a laboratory wind tunnel against male moths. The same three devices were evaluated in simulated warehouse rooms (2000 ft<sup>3</sup>) that contained low, medium or high populations of IMM. Wax panels were effective at controlling reproduction of IMM at all densities in simulated warehouse rooms. Eight separate commercial retail outlets, five pet supply stores and three grocery stores, were used in a field experiment with wax panel's attract-and-kill devices. Four units were

treated with the wax panel at a rate of 1 panel per 2000 cubic feet. The other four retail outlets were used as untreated controls. Moth populations were monitored in all eight retail outlets using traps for male moths and food dishes to assess the number of larvae from moth reproduction. The density of adults and larvae was significantly suppressed by attract-and-kill wax panels during the three month period-experiment ( $P = 0.0071$  for males and  $P = 0.0291$  for larvae) respectively. Thus, wax panels containing Permethrin at 6% [AI] deployed with synthetic female sex pheromone represents a viable method to control IMM pest populations for at least three months, and they are a safe alternative to broadcast chemical control.

## **Vitamin E May Moderately Improve Lipid Parameters in Ovariectomized Rats**

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**Presentation Subject Area: Biological Sciences**

The risk of cardiovascular disease drastically increases at the onset of menopause, in part, due to rise in blood cholesterol and unfavorable changes in lipid profile. This study was designed to investigate the dose-dependent effects of vitamin E supplementation on cholesterol and liver lipids in ovariectomized (ovx) rats. Sixty 12-month old female Sprague-Dawley rats were either sham-operated (sham; 1 group) or ovx (4 groups). All rats were maintained on a semi purified casein-based diet (AIN-93M; 75 IU vitamin E per kg diet) for a period of 120 days. Thereafter, ovx rats were placed on one of four doses of vitamin E treatment (75, 300, 525 or 750 IU vitamin E per kg diet) for 100 days while the sham group was continued on 75 IU vitamin E per kg diet. Ovariectomy tended to increase serum non-HDL cholesterol (24%,  $P=0.1$ ) and decrease HDL-cholesterol (14%,  $P=0.1$ ). Vitamin E does not have any significant effect on serum lipid parameters. Liver total lipids were notably increased ( $P<0.001$ ) in ovx animals and supplementation with vitamin E at 525 IU/kg diet was able to significantly reduce liver total lipids by 13%. Additionally, ovariectomy caused an increase in serum glucose and liver C18:1 fatty acid concentration along with decrease in C18:0, C20:4, and C22:6 fatty acid concentrations. These alterations on liver fatty acid profiles were unaffected by vitamin E. The findings of this study suggest that vitamin E supplementation to ovarian hormone deficient rats may moderately improve lipid parameters.

## **Developing an Information Model to Support Integrating Management Strategies in State Park System.**

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**Presentation Subject Area: Education**

State park system not only offers the recreational opportunities, but carries the obligation of economics and wellbeing for the public. However, there are existing challenges to the conventional manner of park management from the conditions of intense maintenance demand, the complexity of structural development, remote locations and high spatial dependence of state parks in the natural setting. Those challenges reveal that it is essential to construct the principle and structure of spatial integrated database.

The goals of this study were to 1) Provide spatially specified information for infrastructure and amenities maintenance. 2) Support managers in multi-criteria decision making. 3) Consciously reflect the park system to individual park circumstances. The study investigated, first, the role and principles of establishing

recreational resource facilities in public and private agencies, second, the type and function of data requirement to support decision- making processes, and then, the objects and their relationships, including internal and external operating factors, physical resource topology, and interactions with demographic data in order to truly identify the supply- demand distributions of different scopes.

## **The Impact of Biculturalism on Human Learned Helplessness with Northern Plains Native Americans**

**Samantha Chase, Storey, Alan, MA; McDonald, Justin, PhD; Jimenez, Kenneth; Parisien, Stephanie; Keener, Guy; Azure, Janna; Azure, Erica**  
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**Presentation Subject Area: Social Sciences**

This study will investigate the relationship between cultural orientation and learned helplessness with Northern Plains Native Americans. The effect of success/failure using letter anagram tasks will be examined in a standard learned helplessness design. During the study, 60 Native Americans (NA) and 60 European Americans (EA) will be matched into groups based on screening measures of cultural orientation and depression. Participants will be assigned to one of three groups: control, success, or failure. The success and failure groups will be exposed to either success or failure tasks by a study-blind female or male examiner of either American Indian or Caucasian appearance. Subjects' level of biculturalism will be assessed using the Northern Plains Biculturalism Inventory (NPBI), a 30 item questionnaire that assess degrees of cultural competence on two orthogonally related cultural dimensions. Learned helplessness effects will be measured using a post-measurement questionnaire assessing subjects' perceptions on perceived performance on a set of letter anagram tasks. Success and Failure will be manipulated by the examiners, with the Failure group failing all items and the Success group passing easily. Additional items will assess subjects' perceptions of the examiner, based on cultural orientation. It is hypothesized that American Indian subjects recording higher levels of Traditional or Marginal cultural orientation will also show higher levels of frustration and learned helplessness in the Failure group than their more Assimilated and Bicultural peers, as well as the Caucasian subjects.

## **An Exploration of the Preferred Golf Management Competencies**

**Paul Choi**  
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**Presentation Subject Area: Social Sciences**

Scope and Method of Study: This study was designed to explore golf management competencies at PGA recognized golf facilities in the United States. The entire research process aimed to construct a competency model for PGA golf professionals using the Competencies of Golf Course Directors (CGCD) instrument and test this model in the study. The purpose of this study was to discover the importance of needed competencies identified in the PGA professionals' analysis for golf course directors in private, semi-private, and public golf courses in the United States.

Findings and Conclusions: The perceived importance of the management competencies among PGA golf directors at disparate types of golf courses in diverse regions was tested using the Competencies of Golf Course Directors (CGCD) instrument. Competency factors identified in the golf course directors' analysis

indicated the presence of a 2-factor competency model made up of 76 observed competencies including (1) Golf Operations and (2) Client Care Development. Overall response rate for this study were low (10.3 percent) compared to other online surveys. However, the CGCD explained 36.5 percent of variance in the response group.

## **Evolution of the Spiroplasma P58 Multigene Family**

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**Presentation Subject Area: Biological Sciences**

*Spiroplasma kunkelii* and *S. citri* are prokaryotic phytopathogens transmitted primarily by insect vectors. Among the nucleic acid sequence differences between the genomes of the insect transmissible line *S. citri* BR3-3X and the non-transmissible derivative line BR3-G was the absence, in the derivative, of a gene encoding a 58 kDa membrane protein, P58. At least three P58-like gene sequences are present in *S. citri* BR3-3X, and at least seven P58-like gene sequences are present in *S. kunkelii* CR2-3X. Because spiroplasma genomes have evolved to be reduced in size, retention of a multigene family may indicate a significant function for these genes. Alignment of the P58-like sequences revealed different types of N-terminal and C-terminal ends, suggestive of one or more recombination events. A PSI-BLAST analysis indicated that the N-terminal and C-terminal halves of P58 have different origins. The N-terminal half is related to bacteriophage terminases, suggesting a bacteriophage origin, but at least one P58 is present as a surface exposed membrane protein, a context unusual for a terminase. The C-terminal half is related to an adhesin, *Mycoplasma hominis* P50/Vaa protein. The predicted transmembrane regions of both P58 and *M. hominis* P50/Vaa protein are located in the N-terminal half of their respective proteins (Ye et al., (1997) Gene 189: 95-100; Boesen et al. (2001) Protein Science 10: 2577-2586). Recombination events, such as those described here, may have implications for *Spiroplasma* evolution and niche adaptation.

## **Educational Perception of Adolescent Mexicans**

**Nora Contreras-Almeida, Mark Hamlin, and Steven Schuetz**

**McNair Scholar from the University of Central Oklahoma**

**Presentation Subject Area: Education**

The way in which United States born Mexicans and Mexican born Mexicans who later migrate/immigrate to the United States perceive themselves is quite different. In a study conducted by Contreras-Almeida, Hamlin, and Schuetz (2004), it was suggested that the way in which these two groups perceive themselves and their educational atmosphere is contrasting. Immigrants/migrants have a lower perception of receiving an adequate education and institutional support compared to Mexican students who were born in the United States. However, students that were born in Mexico and later immigrated/migrated to the United States had higher means in comparison to the students born in the United States on having a positive student personality, family support, and associating college as a tool for success. Therefore, a qualitative study was implemented to discover how adolescents in Mexico perceive education. Utilizing grounded theory, the participants' answers were categorized and the emerging hypothesis is that these teens indeed value education as well as any avenue that will lead them towards education.

## **Evaluation of the High and Low Dosage Thresholds of Phenylbutazone in Horses with Chronic Navicular Syndrome Using Force Plate Analysis**

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**Presentation Subject Area: Biomedical Sciences**

*Phenylbutazone* is a non-steroidal anti-inflammatory drug that is commonly used for analgesia on a maintenance basis to treat horses suffering from pain and inflammation resulting from musculoskeletal disorders. The drug reduces inflammation and its effects by inhibiting the *cyclooxygenase* enzyme system. Although *phenylbutazone* has been in use for decades, the high and low dosage thresholds of this drug have never been determined. As it can have mild to severe and potentially fatal side effects, usage of this drug should not be taken lightly. Force plates are tools that can be used to determine ground reaction force measurements. They provide an accurate and objective modality for measuring lameness that is unattainable by subjective examinations. In this research project, force plates will be used to measure the mean peak vertical force that a horse exhibits after receiving various doses of phenylbutazone in order to determine the lowest and highest effective doses of the drug.

## **Examining Enrollment and Drop-out Rates Among Freshmen Engineering and Architecture Students**

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**Presentation Subject Area: Education**

The purpose of this study was to examine enrollment trends among engineering and architecture freshmen. The study was descriptive in nature and sought to explain whether differences existed between 2000 and 2005. Furthermore, this study compared the drop out rate of engineering and architecture freshman to ascertain if differences existed during this five year interval. Data were collected from an engineering student academic services office at a mid-western university. Chi-Square analysis was used to compare enrollment trends between 2000 and 2005. In addition, drop out rates for this period were presented. Findings from this study will be reported and suggestions for university decision makers and administrators will be conveyed.

## **Ground Beetle Richness in a Simple and Diverse Relay Crop System in Oklahoma**

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**Presentation Subject Area: Biological Sciences**

Diverse plant communities within agroecosystems support complex assemblages of natural insect predators. *Carabids* are often abundant in these systems and are known predators of crop pests. Our objectives were to identify the cropping system and crop type with the greatest *carabid* diversity, and to determine the function of an interseasonal relay crop (alfalfa) as a reservoir for *carabids*. We compared *carabid* diversity in and between monocultures and relay intercropping systems at two sites in Oklahoma for winter wheat and

sorghum. Each site (25.21 ha) consisted of nine randomly-located plots: three relay intercropping systems consisting of alfalfa, wheat, sorghum, and cotton (12.2 x 48.8 m strips); three winter wheat monocultures; and three sorghum monocultures (48.8 x 48.8 m plots). These plots were separated by 12.2 m-wide open tracks maintained by periodic plowing. We sampled *carabid* populations using standard pitfall trapping methods from fall 2003 through summer 2004. We separated ground beetles into morphological taxa, resulting in 40 genera and 91 species of *carabids*. Due to differences in sampling effort species richness was corrected using rarefaction methods. Rarefaction curves were produced for the following: 1) monoculture versus relay intercrops; 2) crop type by season; 3) crop system by season. This procedure demonstrated that relay intercrop crops were no higher in richness than monocultures. Shannon evenness (J) demonstrated that relay intercrops species were slightly more evenly-distributed than monoculture crops species. Significant differences in species richness were found between seasons, but no differences were found between crop types or systems. We examined the association of *carabid* species with specific crop types and crop systems using partial CCA (ter Braak 1987). Associations between *carabid* assemblages and seasonal crops were found, but there was no specific indication that *carabids* were utilizing relay alfalfa intercrops as interseasonal reservoirs.

## **A Novel Approach for the Investigation of the Potential-Energy Surface of Vibrationally Excited Vinyl Bromide**

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**Presentation Subject Area: Physical Sciences & Technology**

One of the most challenging tasks in the field of molecular dynamics is to generate accurate potential-energy surfaces for molecular systems of three or more atoms. The main challenge arises partly from the size of the potential-energy surface and partly from the human effort that is required to fit it. In order to solve the problem, a novel approach involving the use of molecular dynamics calculations, novelty sampling and artificial neural networks has been utilized. The results show that the novelty sampling method allows the important regions of the potential-energy surface to be rapidly identified and that the interpolation of the neural network fit to the purely theoretical data is excellent even for a six-atom molecular system such as vinyl bromide. This approach is easy to implement and offers substantial advantages over existing methods.

## **Hegemony in Video Games: Visual and Textual Messages Regarding Race and Gender**

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**Presentation Subject Area: Minority Issues**

Top selling video games were analyzed using Provenzo's (1991) semiotics framework that addressed games as cultural texts that provide insight to ideas and values we hold as a culture' (p.99). Focusing on visual and textual messages about race and gender, cover art and thematic content of the top twenty games was examined to determine ideological codes. In addition, the gaming software industry is one in which only the top five percent survive; therefore, the overwhelming dominance of the U.S. in this medium holds

significant meaning. The results from this study suggest that these hegemonic messages, produced almost exclusively by United States corporations, have global implications. Moreover, from a critical theorist perspective, it seems that the video game industry may contribute to the power structure that sustains global socioeconomic hegemony.

## **Responses of Benthic Macroinvertebrates to Metals (Beaver Creek, Ottawa County, Oklahoma)**

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**Presentation Subject Area: Environmental Sciences**

Beaver Creek, located within Tar Creek Superfund Site, is a second order stream with headwaters west of Quapaw, Oklahoma, and feeding into Spring River, Oklahoma. The stream passes through an area referred to as the "Catholic Forty" that is owned by the Quapaw Nation. The Tar Creek Superfund Site is located in the northeastern portion of Ottawa County, Oklahoma. The Site is a former lead and zinc mining area and includes the Oklahoma portion of the Tri-State mining district of northeastern Oklahoma, southeastern Kansas and southwestern Missouri. Mining began in Ottawa County in the early 1900's and continued until the 1970's. The waters at Tar Creek are contaminated with elevated concentrations of iron, lead, zinc, cadmium, and sulfate, with the principal pollutants being lead, cadmium, and zinc. This stream provides an area to study upper levels of biological organization with long-term metal exposure. In order to examine the response of benthic macroinvertebrates to long-term metal contamination two approaches are being taken; 1) comparing resistance to metals within populations of the contaminated stream and a reference stream, and 2) comparing structures of benthic macroinvertebrate communities of the contaminated stream and a reference stream. Metal analyses using atomic absorption spectrometry have shown bioaccumulation within five macroinvertebrate orders. Within the laboratory, amphipod toxicity tests are currently being conducted, with oxygen consumption and growth being future objectives for measurement of resistance. The community response to stress will be measured using species diversity and trophic (food web) levels.

## **Tetrahydroisoquinolines by a Tandem Reduction-Reductive Amination Reaction**

**Elizabeth Easton and Richard A. Bunce**  
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**Presentation Subject Area: Physical Sciences & Technology**

Tandem reduction-reductive amination methodology has been used in a new synthesis of tetrahydroisoquinolines, an important ring structure found in many biologically active compounds. The required 1-(2-cyanophenyl)-2-alkanone substrates were prepared by benzylic deprotonation of 2-methylbenzonitrile using lithium diisopropylamide and acylation using N-methoxy-N-methylalkanamides. Reduction of these cyano ketones should give the target heterocycles by reduction of the nitrile to the amine followed by reductive amination of ketone. Initial attempts to induce cyclization were done under 3 atmospheres of hydrogen using 5% palladium-on-carbon as the catalyst in 1:1 methanol:concentrated hydrochloric acid, followed by mild basic workup. These conditions afforded 30-35% yields of the

tetrahydroisoquinolines along with 5-10% of the ester derived from acid catalyzed nitrile methanolysis. In later experiments, reduction under 1 atmosphere of hydrogen using 5% rhodium-on-alumina as the catalyst in 10:1 acetic acid:acetic anhydride gave 50-60% of the desired heterocycles as their N-acetyl derivatives. This variation not only provided higher yields of the tetrahydroisoquinolines, but also permitted easier product isolation. Restricted rotation around the amide C-N bond complicated spectral interpretation for the N-acetyl compounds, but reduction of the amide carbonyl using lithium aluminum hydride gave (‘)-3-alkyl-2-ethyltetrahydroisoquinolines, which were more easily characterized.

## **Electronic Structure Study of Helical Silver Nanotubes and Nanowires**

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**Presentation Subject Area: Physical Sciences & Technology**

We investigate the electronic structures of extended helical silver single-wall nanotubes and nanowires. Calculations are carried out on twenty-one different silver nanotubes ranging in radii from approximately 1.3Å to 3.6 Å. Nanotubes with sufficiently large radii were also calculated with a silver atomic chain inserted along the nanotube’s axis; these composite structures are termed nanowires. The analysis is implemented within first-principles, all-electron self-consistent local density functional approach (LDF) adapted for helical symmetry. Energetic trends for the silver nanotubes are not as predictable as expected. For example, the total energy does not necessarily decrease monotonically as nanotube radius increases, as is the case for single-wall carbon nanotubes. The conductivity of these structures is also addressed. The number of available conduction channels in the nanotubes and nanowires do not always correspond to the number of atom rows comprising the nanotube. Inserting the atomic chain along the nanotube axis, however, lowers the energy bands of the nanotube with respect to the Fermi level, consistently resulting in one additional conduction channel.

This work was supported by the ONR, the DoD HPCMO CHSSI program, and the NSF Oklahoma EPSCoR NanoNet program.

## **Comparison of Ablation Season Length and Mass Balance on the Taku Glacier, Alaska**

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**Presentation Subject Area: Environmental Sciences**

As part of the Juneau Ice field Research Program students must conduct research projects as part of the continual health record of the Juneau Ice field. With TempMentors placed in six base camps around the ice field recording temperature data in Celsius every two hours a comparison of ablation season length and mass balance of the Taku Glacier in an effort to understand of season length has a stronger effect than other factors such as temperature magnitude. To determine ablation season length the average temperature for each day is calculated and a method of measuring the length of days from the first nonzero temperature day in the spring to the last nonzero temperature day in the fall is used. The discovery is that there is no direct length between ablation season length and glacier mass balance can be seen.

## **Comparison of Serum Inflammatory Mediators in Fatigued and Non-Fatigued Canine Athletes**

**Jessica Evans, Sabrina Cummings, and Chris Royer**  
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**Oklahoma State University**  
**Presentation Subject Area: Biological Sciences**

This project is designed to analyze the effects of exercise stress on the immune system. The project involves testing serum samples taken from sled dogs who run in the annual Iditarod race in Alaska using ELISA assays to measure cortisol, cytokines, and other markers of stress. The results will illustrate the effects of strenuous exercise on the health of the animal; how stressed the animal was and what parts of the immune system were affected. It is anticipated that the results will enable us to develop medications to treat exercise related diseases in humans and animals, as well as serve as early markers for impending exercise-related diseases.

## **Tongue War: Montreal Québec's Dialect and its Origins as Opposed to Standard French**

**Sylvie Evdoxiadis**  
**McNair Scholars Program from Harding University**  
**Presentation Subject Area: Minority Issues**

The purpose of this research is to investigate how the Québécois dialect diverged from Standard French and the reasons why it varies from it. Intriguingly, many people from Québec are unaware that their French differs from that of France; most never even think about it (Blais and Porhiel 87-89). But whenever a Québécois meets a Frenchman and finds that he is not completely understood by the latter, questions may arise. It is crucial for French Canadians to understand why their speech differs in order to reform their thinking and attitudes toward their fellow French and fellow English folk. Encouraged by Charles de Gaulle's declaration of 'Vive le Québec libre!' on 24 July 1967 (Fontaine 393), many separatists not well informed on their linguistic dialect try to emulate France (Roberts 42), and break all relations with Canada; but by realizing that English strongly influences their language and culture, they may begin to banish their hatred for their Anglo-Canadian neighbors, their will to separate or their wish to imitate the French. Furthermore, the realization of the fact that direct linguistic connections with France ceased after the English conquest of Canada in 1759-1763 (Rottet and Golembeski 100; Meney 10) might influence separatist tendencies both to restore linguistic ties with the French and to accept English borrowings.

Québécois and French differ enough for communication problems to occur, in attitude or in speech (Robert 33, 36; Blais and Porhiel 87-89; Mercier and Verreault 88). For French Canadians to understand themselves better as well as the surrounding peoples who contributed to the evolution of their speech, like the Amerindian natives (Elliott 159, 162, 169; Chamberlain 232), the French (Chauveau and Lavoie 407, 408, 411) and the English (Clas 850, 853; Meney 33), they may benefit from learning that their "language" formed from these three influences and realize that they are at the same time a unique, different and important people (Boulanger and Cormier 62; Poirier 141). Hopefully, other peoples will also recognize the uniqueness of Québec's culture and language, and learn more about the history of a dialect little known to the general population.

## **Carrying Capacity of Oklahoma's Sand Dune Parks**

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**Oklahoma State University**  
**Presentation Subject Area: Environmental Sciences**

This study was done in response to a request by Oklahoma Tourism and Recreation Department to establish a carrying capacity for Little Sahara State Park (LSSP) and Beaver Dunes State Park (BDSP). Both of these parks consist of active or "open" dune environments, ~ 1500 acres at LSSP and ~ 500 acres at BDSP that attract large quantities of ORV enthusiasts. It is widely known that ORV riding when conducted irresponsibly can be both dangerous to people and harmful to plant life and wildlife. We used the Visitor Experience and Resource Protection (VERP) framework developed by the NPS to determine an acceptable balance between the natural and built environment and visitor experience, set a carrying capacity, and develop a monitoring strategy specific for each park. We found that a maximum of 1650 people at LSSP (1.1 person/acre) and 300 people at BDSP (0.6 person/acre) at one time to be appropriate carrying capacities. These numbers are limited by campground amenities and day-use parking capacity.

## **Cheating and Getting Caught: Variables that Effect Classroom Cheating Success**

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**Presentation Subject Area: Social Sciences**

Cheating has become a widespread and accepted phenomenon, yet, to date, there has been no research regarding the differences between those that cheat and get caught and those who cheat and get away with it. It is hypothesized that participants with higher test anxiety will be more likely to be caught cheating. Second, participants with higher impulsivity will be more likely to be caught cheating. Third, those with higher IQ s will be more likely to avoid detection than those with lower IQ s. Fourth, participants that misgauge their risk of detection will be more likely to get caught. Fifth, participants with low test-wiseness will have a higher detection rate.

## **Isolation, Characterization, Mapping and Differential Gene Expression Analysis of Porcine Tissue Kallikreins During Early Embryonic Development**

**Samodha Fernando, Xiaoping Guo<sup>1</sup>, Fares Z. Najjar<sup>2</sup>, Bruce, A. Roe<sup>2</sup>, Rodney, D. Geisert<sup>1</sup>,  
Udaya DeSilva<sup>1</sup>**  
**Department of Animal Science**  
**Oklahoma State University**  
**Presentation Subject Area: Biological Sciences**

*Kallikreins* are members of a multigene family of serine proteases that are widespread throughout living organisms. They are found in diverse tissue specific patterns and are known to have highly diverse physiological functions. To gain insight into the structure and evolutionary origins of the *kallikrein* gene region in the pig, we have isolated several BAC clones containing members of the porcine tissue *kallikrein* gene family and constructed a BAC clone based Physical map of the porcine greater *kallikrein* gene region. We have also mapped the *kallikrein* gene region to porcine chromosome 6q1.2.

Sequence analysis of the greater *kallikrein* region has revealed the presence of 13 *kallikrein* genes in the porcine genome, among which 11 are novel porcine *kallikrein* genes. Furthermore, as a first step towards understanding the tissue specific expression patterns of the pig *kallikrein* gene family members, we have performed a global expression analysis of all porcine tissue *kallikreins*. We have also conducted quantitative real-time PCR based, expression analysis of porcine *kallikreins* to evaluate the expression of tissue *kallikreins* in the porcine endometrium and conceptus during the estrous cycle and early embryonic development to better understand the role of *kallikreins* in placental development and embryonic survival in the pig.

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## **Characterization of three genes coding membrane proteins of Phytoplasma chrysanthemum yellows (CY 16SrI-B) *Candidatus* Phytoplasma asteris**

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**Oklahoma State University**

**Presentation Subject Area: Biological Sciences**

Phytoplasmas (*Class Mollicutes*) are phytopathogenic wall-less prokaryotes that colonize the phloem of several plants and are transmitted by insects in the order *Homoptera*. These microorganisms have never been cultivated in axenic culture and can be only studied in their host plants and insect vectors. A disease of several herbaceous crops, chrysanthemum yellows, CY, is associated with *phytoplasmas* belonging to the genetic group 16SrI-B (*Candidatus* 'Phytoplasma asteris'). In order to better characterize this phytopathogenic microorganism, three membrane protein genes have been sequenced and analyzed.

These DNA regions coding membrane proteins have been first identified in the genomes of phytoplasmas causing onion yellows (OY) and aster yellows (AY), which belong to the same taxonomic subgroup as CY. These sequences code for (i) the preprotein translocase subunit SecY, (ii) the Antigenic Membrane Protein, Amp, and (iii) the ARginine Transporter, ArtI. The cellular localization of these proteins, predicted by TMHMM software, shows large regions exposed outside the membrane. The similarity between OY and AY genomes in these sequences resulted 94% (SecY), 65% (Amp) and 92% (ArtI). Based on these alignments, five primer pairs were designed and used to amplify total DNA extracted from CY-diseased periwinkle. Three amplicons out of five confirmed to be CY-specific and were cloned and sequenced. Alignment of these CY regions with the corresponding sequences of OY and AY showed CY to be more similar to OY (96% on SecY and Amp, 99% on ArtI) than to AY (92% on SecY, 48% on Amp and 82% on ArtI).

## **Development of a Real-Time PCR-Based Diagnostic Tool to Identify Prion Protein Haplotypes**

**Ryan W. Geisert, Xiaoping Guo and Udaya DeSilva**  
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**Presentation Subject Area: Biological Sciences**

Scrapie, a fatal neurodegenerative disease in sheep and goats, is a member of the mammalian transmissible spongiform encephalopathy (TSE) disease family. Other members of this disease family include Creutzfeldt-Jakob disease (CJD) in humans, bovine spongiform encephalopathy (BSE, also known as “mad cow disease”), and chronic wasting disease (CWD) in deer.

The causative agent for scrapie is believed to be an isoform of sheep prion protein (PrP<sup>sc</sup>), which is derived from an endogenous precursor (PrP<sup>c</sup>). In sheep polymorphisms within the prion gene (PRNP) are associated with susceptibility/resistance to TSEs. Specifically, polymorphisms in codons 136, 154 and 171 have been reported to affect the susceptibility to the disease. At least one allele with an arginine (R) at codon 171 confers resistance to scrapie in most forms of scrapie while two alleles of Glutamine (Q) at codon 171 makes animals susceptible. Similarly, An alanine (A) at codon 136 is desirable as it makes animals resistant to disease while a valine (V) would make animals susceptible.

Although various techniques exist for identifying polymorphisms at each codon, it has been very difficult to identify the “phase” of each polymorphism in relation to each other or the haplotype of the PRNP with existing techniques. We have developed a real-time PCR-based diagnostic tool that is capable of rapid, accurate and reliable identification of PRNP haplotype from field blood samples.

## **Child Care Providers’ Reactions to Children’s Negative Emotions**

**Sherri Gosney**  
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**Oklahoma State University**  
**Presentation Subject Area: Education**

With increasing numbers of young children in child care in the United States, interest in the impact of this care is growing as well. Although emphasis on academic milestones and school readiness receives more attention in both the popular press and professional literature, the impact of group care on children’s emotional development deserves attention as well. Research has demonstrated that positive child outcomes are related to characteristics of the teacher-child interactions, including teacher sensitivity and warmth. While numerous observational measures exist to assess these types of teacher behavior, no widely used self-report measures exist.

The purpose of this study is to pilot a self-report instrument that assesses teachers’ reactions to children’s negative emotions, including fear, anger, sadness, and frustration. Specifically, this study will assess the degree to which participants’ self-reported behaviors accurately represent their true behaviors. Each participant completed the Teachers’ Coping with Children’s Negative Emotions Scale (TCCNES), which includes twelve situational vignettes and asks respondents to rank the likelihood that they would react in each of six ways. The six possible reactions represent the six subscales of the measure: punitive reactions, personal distress, minimization, problem-focused coping, emotion-focused coping, and expressive encouragement.

Each participant was observed for at least two hours in their child care classroom. Each time a child expressed a negative emotion, the observer coded the teachers' response using the same subscales as the TCCNES. Frequencies will be calculated for each type of reaction and compared to participants' self-reports on the TCCNES.

## **Interactions of Metal Carbene Complexes with Organic Molecules of Biological or Technological Importance**

**Tahereh Hajimirzaei, Dr. LeGrande Slaughter, and Yoshita A. Wanniarachchi**  
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**Oklahoma State University**  
**Presentation Subject Area: Physical Sciences & Technology**

Carbene complexes of palladium or other transition metals are readily prepared by first reacting palladium chloride with methyl isocyanide. This reaction prepares the palladium for its reaction with 2,6-diaminopyridine or similar organic nucleophiles resulting in the formation and isolation of a palladium carbene complex. These metal carbene complexes have aromatic  $\pi$ -systems that interact with various aromatic organic molecules through a process called  $\pi$ -stacking. This research focused on interactions between palladium complexes and two types of organic molecules: DNA nucleobases and nitroaromatic compounds related to explosives. Successful  $\pi$ -stacking requires the solvents being used to have not only different densities but also solubility properties. Therefore, in order to effectively grow crystals, the palladium carbene complexes and nitroaromatic compounds had to be extensively tested for solubility in different solvents. The crystals obtained and isolated through this process will be analyzed through x-ray diffraction to determine structural properties. This study may assist in the development of new pharmaceutical drugs and the more effective chemotherapeutical techniques. The work with nitroaromatic compounds may also lead to the enhancement of explosive deactivation methods.

## **Oklahoma Baby Boomers' On-Line Purchasing Behavior and Methods for Locating New Websites.**

**Reagan Hamlin, Glenn Muske, Jane Swinney, and Mike Woods**  
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**Oklahoma State University**  
**Presentation Subject Area: Social Sciences**

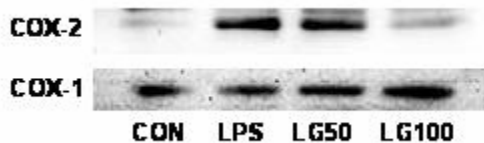
The United States Census Bureau estimated in the year 2000 that 75 million Americans were over the age of 50 (U.S. Census Bureau, 2000). Of these identified 75 million, 20 million were classified as 'Boomers.' Most Boomers now have reached their peak earning potential and have discretionary money that they aren't afraid to spend (Mummert, 2004). They are considered the most affluent Americans with an estimated \$1 trillion in disposable income annually (Leinweber, 2001; Mummert, 2004). How they choose to spend their money is a popular question among business professionals. With the growing popularity of the Internet, previous studies have focused on the demographic and psychographic breakdown of different on-line consumer segments; however, little research attempts to focus specifically on the Boomers' use of the Internet. A questionnaire on Internet purchasing behavior and Internet travel behavior was administered to various Oklahoma demographic segments in 2004. For the purpose of this study, the Boomer consumer segment was analyzed separately from the final results to determine their specific use of the Internet, product

categories purchased online, and preferred information sources for new web sites. Results showed that almost a quarter of Boomer participants utilized the Internet with almost 50 percent actually making a purchase on-line. Of the items purchased, over 50 percent of respondents purchased travel items on-line including tickets or reservations. Food, groceries or beverages were identified as the least purchased items with only 5.4 percent. When identifying their methods for locating new web sites, Boomer participants relied heavily on print media and Internet searches. However, almost 80 percent of participants also identified word of mouth as an important source for new web site information. These results have important implications for business professionals. The older market tends to be viewed negatively by business professionals who assume the older generation is not interested in technology. However, the older market is rapidly shifting with the Boomers turning 60 this year. They are slowly becoming the older market and business professionals need to adjust their views on the aging population in order to capitalize on their spending power. Also, participants showed a substantial interest in using the Internet for travel information. This is important information for travel professionals to consider as Boomers near retirement. Once retired, Boomers will experience an increase in leisure time making them a prime target for the travel industry.

## **Genistein May Suppress the Synthesis of Proinflammatory Molecules in Human Chondrocyte Cell Line**

**Shirin Hooshmand, D.Y. Soung, S.V. Madihally, L. Devareddy, E.A. Lucas, and B.H. Arjmandi**  
**Department of Nutritional Science**  
**Oklahoma State University**  
**Presentation Subject Area: Biological Sciences**

Previously, we reported that cartilage is an estrogen receptor (ER) positive tissue and that mRNA levels of ER $\beta$  increase in postmenopausal women with osteoarthritis. Based on our findings and those of other investigators, we hypothesize that local rather than circulating estrogen levels negatively affect *chondrocyte metabolism* and that selective estrogen receptor modulators (SERM) augment cartilage health. To test the latter part of our hypothesis, we have begun to explore the role of genistein, a naturally occurring SERM with high affinity to bind ER $\beta$ , in inhibiting the lipopolysaccharide (LPS)-induced cyclooxygenase (COX)-2 but not COX-1 in human chondrocytes (HCH). Cells (PromoCell, Germany) were treated with three levels of genistein (0, 50, and 100  $\mu$ M). After one hour, the genistein-treated cells were stimulated by one  $\mu$ g/mL LPS for six hours. Cells were then harvested and the cytosolic fraction was isolated for assessing COX-1 and COX-2 protein levels using Western blot.



Our preliminary data indicate that the LPS-induced increase in COX-2 protein level is reduced by pretreatment of 100  $\mu$ M of genistein, whereas COX-1 protein level is not affected by genistein. These findings support our clinical study (Arjmandi *et al. Phymed*, 11:567-575, 2004) that patients with osteoarthritis may benefit from consumption of soy isoflavones.

## **Comparison of Different Fruit Juices in Down-Regulating Nitric Oxide Production in RAW 264.7 Macrophages Challenged with Lipopolysaccharides**

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**Presentation Subject Area: Biological Sciences**

Abstract not submitted.

## **Emergent Phenomena in India after the Indian Ocean Tsunami**

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**Presentation Subject Area: Social Sciences**

The December 26, 2004, tsunami greatly affected the people of Tamil Nadu, India. In the aftermath of this disaster, research was carried out to study Emergence. Emergence is characterized by the appearance of ad-hoc group(s) of individuals that handle disaster-generated tasks of search and rescue and body handling. A number of emergent groups appeared in the District of Nagapattinam, Tamil Nadu after the tsunami. Emergent characteristics were witnessed across the State Level, District Level (Hospital and Fire Departments), Non-Government Organization Level, as well as, at the Local Level.

At the State Level, the Indian Administrative Service (IAS) Officers formed 11 teams and went into the impacted area to conduct search and rescue and body disposal activities. These teams comprised of officers and administrators from varying levels of government that include, water and sanitation departments, revenue departments, police and fire departments and electricity board officials. The formation of these teams was spurred by the seniority and authority that IAS officers command. Their ability to make independent decisions in the field and the efficient allocation of funds towards disaster-generated needs; facilitated the formation of IAS teams as well. At the district level, emergence took the form of new methods of post-mortem and emergent body handling tasks. Non-Government organizations acted as the primary resource provider after the disaster and facilitated the needs of IAS teams in the field. At the local level, self-help appeared the best method of body recovery, at least in the first 3 days after the tsunami. Locals organized themselves into groups, performed search and rescue activities and body handling tasks. Without the availability of technology or assistance from the district or state level, the locals made make-shift stretchers from bamboo poles and sacks to transport the dead to temporary resting places (for identification purposes) and then to final resting places, in mass graves.

This study allows a cross-comparative study of disasters and the conditions that foster emergence. It is the first study of its kind in India and the very first study based on a tsunami event in India.

## **Carbon Nanotubes as Photovoltaic Materials**

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**Oklahoma State University**

**Presentation Subject Area: Physical Sciences & Technology**

Solar energy is our only long-term environmental friendly renewable energy source, and photovoltaic devices are the most direct way of converting the solar energy to electricity.

One major approach of efficient *polymeric photovoltaic* materials lie in the use of bulk hetero-junctions, which mix two different organic polymeric materials which act as donor and acceptor semiconductors. In these bulk hetero-junctions the donor polymer typically acts as the light absorber, creating an electron-hole pair and then donating the excited electron to the acceptor polymer. Recent reports by Kymakis *et al.* suggest that mixtures of single wall *nanotubes* (SWNT) and *poly-3-octylthiophene* (P3OT) represent an alternative class of organic semiconducting materials that can be used to manufacture organic photovoltaic cells with improved performance. A deep theoretical understanding of the physical process at work in these materials will require a knowledge of the electron states near the Fermi level for both the donor and the acceptor. We calculate the electronic structure of infinitely long quasi one-dimensional nanostructures such as carbon *nanotubes* or *electroactive chain polymers*, such as *polythiophenes* using a first principles, all electron, self consistent local density functional (LDF) approach. We present and compare electronic structure calculations for SWNTs and poly-3-alkyl-thiophenes. Further we discuss the variation of effective mass of charge carriers in polymers and SWNTs in the vicinity of Fermi level. This work was supported by the US office of Naval Research and the DoD HPCMO CHSSI program through the Naval Research Laboratory.

## **The Dose-Dependent Effects of Dried Plum Polyphenol Extract on Nodule Formation and Bone Mineralization**

**Leila Kamkar, S. Hooshmand, E.A. Lucas, S. Madihally, and B.H. Arjmandi**

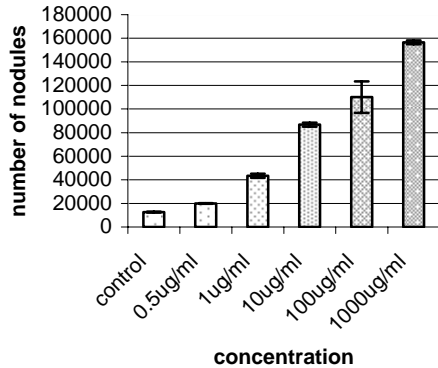
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**Oklahoma State University**

**Presentation in Biological Sciences**

Our earlier findings indicate that dried plums are highly effective in preventing and reversing ovarian hormone-deficiency-associated bone loss in a rat model of osteoporosis. Moreover, our short term clinical trial showed that dried plum supplementation significantly increased indices of bone formation in postmenopausal women. The bone protective effect of dried plum, in part, may be due to its polyphenol content. The intent of the present study was to investigate the bone protective mechanisms of action of polyphenols extracted from dried plum using a cell culture system. We hypothesize that polyphenol extract from dried plum will increase bone mineralization in MC3T3-E1 cell line. MC3T3-E1 cells were treated with various doses of polyphenols (0, 0.5, 1, 10, 100, 1000  $\mu\text{g/ml}$ ). Media was collected every three days and analyzed for alkaline phosphatase activity. After 14 days, the formation of mineralized nodules was characterized by Alizarin red staining. Our findings indicate that dried plum polyphenols dose-dependently increased mineralization without affecting cell viability as shown by resazurin assay. Alkaline phosphatase activity was significantly increased at days six and nine. Among the dose tested, 100  $\mu\text{g/ml}$  of polyphenol caused a significant elevation of alkaline phosphatase activity. The effects of polyphenols on the protein levels on factors involved in osteoblastic activity such as collagen type I, bone matrix protein, insulin-like

growth factor (IGF-I) will also be assessed .



### Additive Bone Protective Effects of Fuctooligosaccharide and Soy Isoflavones.

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Department of Nutritional Science

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Presentation Subject Area: Biological Sciences

We have previously reported that the addition of *fructooligosaccharide* (FOS), an indigestible fermentable polysaccharide, to soy protein (Soy) reverses the loss of BMD in ovariectomized (Ovx) osteopenic rats. In this study, we examined the effects of Soy, FOS, and their combination on microstructural properties of tibiae. For this, 60 nine-month old female Sprague-Dawley rats were either sham-operated (sham) or Ovx and then maintained for 90 days to establish bone loss. Thereafter, rats were divided into five groups (n=12; one Sham and four Ovx): Sham, Ovx (control), Soy, FOS+casein, and FOS+Soy. After 125 days of dietary treatment, rats were necropsied and bones were analyzed. Treatment effects on selected bone microstructural properties were assessed using microcomputed tomography (Scanco Medical). Below is a summary of our findings.

| Measures | Sham               | Ovx                | Soy                | FOS                 | FOS+Soy             | P Value |
|----------|--------------------|--------------------|--------------------|---------------------|---------------------|---------|
| BV/TV    | 0.111 <sup>a</sup> | 0.069 <sup>b</sup> | 0.061 <sup>b</sup> | 0.069 <sup>b</sup>  | 0.075 <sup>b</sup>  | 0.0007  |
| ConnD    | 20.1 <sup>a</sup>  | 5.7 <sup>b</sup>   | 5.3 <sup>b</sup>   | 6.1 <sup>b</sup>    | 8.1 <sup>b</sup>    | <.0001  |
| SMI      | 1.98 <sup>b</sup>  | 2.50 <sup>a</sup>  | 2.71 <sup>a</sup>  | 2.61 <sup>a</sup>   | 2.59 <sup>a</sup>   | 0.0003  |
| TbN      | 2.03 <sup>a</sup>  | 1.54 <sup>bc</sup> | 1.50 <sup>c</sup>  | 1.61 <sup>bc</sup>  | 1.81 <sup>ab</sup>  | 0.0003  |
| TbTh     | 0.078 <sup>b</sup> | 0.090 <sup>a</sup> | 0.088 <sup>a</sup> | 0.087 <sup>a</sup>  | 0.085 <sup>ab</sup> | 0.0234  |
| TbSp     | 0.507 <sup>c</sup> | 0.668 <sup>a</sup> | 0.691 <sup>a</sup> | 0.634 <sup>ab</sup> | 0.559 <sup>bc</sup> | 0.0057  |

Data are mean (n=12). Values in a row that do not share the same superscript letters are significantly (P<0.05) different from each other.

In terms of certain *trabecular microstructural* properties, the results of this study indicate that the

combination of these two agents is better than either alone. FOS, in part, may enhance the bone protective effects of soy isoflavones by altering gut microflora that improves calcium and isoflavone bioavailability.

## **Phylogenetic typing of *Listeria monocytogenes* by multi-locus sequence typing (MLST) and Pulsed field gel electrophoresis (PFGE)**

**Kalpana Kushwaha and P.M. Muriana**  
**Department of Food Science**  
**Oklahoma State University**  
**Subject Area: Biological Sciences**

*Listeria monocytogenes* is a Gram-positive, intracellular foodborne pathogen that can cause listeriosis having high fatality rates (25%) in large outbreaks. Subtyping of isolated strains may help track transmission sources within food processing plants. Our objective is to examine the discriminatory power of several subtyping methods, including multilocus sequence typing (MLST), pulsed-field gel electrophoresis (PFGE), and ribotyping for various virulence-related genes as a means of typing strains of *L. monocytogenes* obtained from food processing plants, retail raw meats, and animal production facilities. MLST was performed on 45 food isolates of *L. monocytogenes* based on genetic loci in the hemolysin (*hlyA*), internalin (*inlA*), positive regulatory factor (*prfA*), and actin polymerization (*actA1*, *actA2*) genes. PCR products of 500-590 bp were amplified for each isolate, sequenced in both directions (OSU Core Facility), and manually joined to form an artificial composite gene using the neighbor joining method of Vector NTI Suite (ver. 9.0), and compared by multiple sequence alignment and clustal analysis. The 45 isolates were identified and differentiated into two main groups based on the degree of divergence between the strains. The data obtained from MLST will be compared with PFGE and ribotyping (Qualicon software) for selected strains to compare the discriminatory power of these approaches. Thirteen strains selected from MLST groupings were run with PFGE using restriction enzymes *AscI* and *ApaI*. Dendrographic groupings of the PFGE fingerprints will also be examined by clustal analysis using BioNumerics software package (version 4.01; Applied Maths). DNA-based methods can define bacterial subtypes using either PCR amplification and sequence analysis or restriction digestion of bacterial DNA to generate DNA fragment banding patterns. Typing pathogenic bacteria from environmental sources involved in food processing may help establish strains that are persistent and may have harborage sites within the processing facility.

## **Evaluating the Effectiveness of Child Sexual Abuse Prevention Programs**

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**Oklahoma State University**  
**Presentation Subject Area: Social Sciences**

In 2003 Child Protective Services (CPS) reported that there were approximately 89,694 victims of substantiated child sexual abuse. Child sexual abuse prevention programs are becoming a common occurrence in the school setting. A national survey by Finkelhor and Dzuiba-Leatherman in 1995 suggested that 67% of American school children have been exposed to a prevention program (Finkelhor & Daro, 1997). These programs cover similar topics which include, explaining what sexual abuse is, broadening awareness of who possible abusers are (no longer stranger-danger), teaching that children have the right to

control the access of others to their bodies, describing a variety of “touches” that a child can experience, stressing actions that children can take, teaching that some secrets should not be kept, and teaching most importantly that the child should tell a trusted adult and keep telling until they get help (Haugaard, 1988).

The most fundamental goal of sexual abuse prevention programs is to prevent sexual abuse by teaching behaviors to children that will help them be able to recognize, resist and report sexual abuse (Leventhal & Conte, 1987). The primary prevention of sexual abuse prevention programs has been defined as strengthening children’s abilities to recognize potentially abusive situations and teaching them strategies to resist, and the secondary prevention of sexual abuse prevention programs has been to encourage victims to disclose abuse (Haugaard, 1988; Wurtele, 1998, 2002).

Children are the main focus in sexual abuse prevention programs to educate and to train. In sexual abuse prevention programs potential victims not potential perpetrators are targeted and the educational focus provides little to families that have already experience sexual abuse in contrast to child abuse prevention programs where the approach is to seek to identify high-risk families, the intervention is focused on potential perpetrators, and provides services to families that have experienced this type of abuse.

The intent of this paper is to evaluate whether or not sexual abuse prevention programs are effective in preventing sexual abuse. The assumption of any sexual abuse prevention program is that a child who goes through the program will be less likely to become a victim compared to a child who does not participate in such a program. It is also assumed that children will be more likely to report sexual abuse after going through a prevention program. Do these programs accomplish these assumptions?

In order to determine if sexual abuse prevention programs accomplish the assumptions mentioned above information will be evaluated using the following: meta-analyses, narrative summaries, and empirical studies covering cognitive, developmental, and emotional factors, retention, sex offender’s efficacy, and retrospective studies. In conclusion, there are no strong findings in this report that suggest a child’s participation in a child sexual abuse prevention program will decrease the likelihood of becoming a victim or will increase the likelihood of self-report. Further studies on the efficacy of child sexual abuse prevention programs are needed.

## **Hepatic Clearance of Paclitaxel in Dogs**

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**Department of Animal Science**  
**Oklahoma State University**  
**Presentation Subject Area: Biomedical Sciences**

Anticancer agents are generally dosed based on body surface area (BSA). Hepatic clearance, modeled as an allometric function of signalment, may better predict drug disposition as compared to the BSA method. In our studies, we will be incubating a taxane anticancer agent, paclitaxel, with canine microsomal cytochrome P450 preparations. We will then use high pressure liquid chromatography to determine the resulting concentrations of paclitaxel and its metabolites. The in vitro rate of paclitaxel hepatic metabolism will be estimated from these data. The in vivo paclitaxel clearance will be predicted from these in vitro calculations and will be tested in future studies .

## **Artificial Gravity (2G) has a Negative Effect on Bone Quality**

**Jenny Lessley, Barbara J. Stoecker, Lisa Baer, Joe Tash, and Ruth K. Globus**  
**Department of Nutritional Science**  
**Oklahoma State University**  
**Presentation Subject Area: Biomedical Sciences**

Bone loss due to reduced gravity is a major problem in the spaceflight environment and increased mechanical loading created by artificial gravity is one of the countermeasures being considered by NASA. In this study, 24 adult male Fischer 344 rats were randomly assigned to three groups: 1) Vivarium Control Fed ad libitum (VC); 2) Stationary Control - Pair-Fed to 2G Group (SC); 3) 2G Group (2G). Mechanical load was increased to 2G by placing animals in cages on a 24-ft diameter centrifuge available at the NASA Ames Research Center. Final body weights were 346 g, 325 g, and 287 g respectively indicating that centrifugation reduced body weight by mechanisms in addition to reduction in food intake. After 45 days rats were euthanized and bones frozen for analysis. Micro architecture of the distal femur was evaluated using a microCT 40 scanner; one hundred 16.5-micron slices were contoured as a volume of interest (VOI). Finite element analysis was used to predict bone strength. Significance was set at  $p < 0.05$ . Cortical thickness of the femoral midshaft and connectivity density and trabecular number (TbN) of the VOI were reduced and trabecular separation (TbSp) was increased in the SC compared to the VC. Strain, force to compress the VOI, stiffness, and size-independent stiffness were decreased and von Mises stresses increased in cancellous bone from femur in SC compared to VC. Bone volume fraction and TbN were decreased in the 2G group compared to the SC group and TbSp was increased. Strength parameters including force for compression, stiffness, and size independent stiffness tended to decrease ( $p < 0.07$ ) in 2G compared to SC, and von Mises stresses tended to increase ( $p < 0.08$ ) in the 2G group. It appears that doubling mechanical load by application of a continuous force by centrifugation is not a useful countermeasure to prevent bone loss.

(Supported by the Niblack Scholars Fund and Oklahoma Agricultural Experiment Station).

## **Integrity Monitoring of Containers using RFID/RF Sensor Networks**

**Roger Liao and Dr S.T.S Bukkapatnam**  
**Department of Industrial Engineering and Management**  
**Oklahoma State University**  
**Presentation Subject Area: Physical Sciences & Technology**

Securing cargo movement through the international supply chains that service American consumers and businesses is critical to the security of national infrastructure. With over tens of thousands of containers arriving each day at the ports, information technologies to monitor and assure integrity of the containers are essential to attain global end-to-end supply chain security and operational efficiency. This paper addresses integrity monitoring of a moving container based on tracking the patterns of vibration response under ambient loading using a wireless sensor network. From the analysis of the vibration data from accelerometer sensors attached to moving containers, one can discern vibration patterns and their evolution under various terrain (road, off-road, gravel) and operating conditions (speeds, container positions, etc.). For example, vibration generated due to movement was found to track collisions of the contents inside container as well as collision of containers. It can also let engineers notice abnormal vibration patterns to identify incipient anomalies which can cause a severe harm to the integrity of a container.

\*\*This work is executed under the guidance of Dr S.T.S.Bukkapatnam (IEM, OSU)

## **A Novel Approach for Rapid Identification and Sequencing of Different Bacteriocins Produced by LAB Based on a Practical 'Immunity class'.**

**Sunita Macwana and P. M. Muriana**  
**Department of Food Science**  
**Oklahoma State University**  
**Presentation Subject Area: Biological Sciences**

Bacteriocins (i.e., inhibitory proteins) produced by lactic acid bacteria (LAB) are considered “natural antimicrobials” that may enhance the safety of foods. With numerous claims of “new bacteriocins”, it is important to employ methods to identify unique bacteriocins or those that have not been previously characterized.

Our objectives were to develop a rapid microbial and molecular method to readily identify different “immunity classes” of bacteriocins of LAB that would have complementary inhibitory activity and to obtain structural gene sequence information for those bacteriocins.

Bacteriocin-resistant (Bac<sup>R</sup>) strains of *L. monocytogenes* were made to select LAB bacteriocins. The Bac<sup>R</sup> *Listeria* were then used as indicators to find additional bacteriocin-producing strains from retail foods. This cycle was repeated 3 consecutive times. Bacteriocin-producing strains of interest were then subjected to a SYBR Green-based real-time PCR array using sets of primers made from the coding sequence for all known LAB bacteriocin structural genes and sequenced at our university core facility.

Bacteriocins were considered to be of the same “immunity class” if *L. monocytogenes* that was Bac<sup>R</sup> to a particular bacteriocin became cross-resistant to other bacteriocins. These bac-resistant *L. monocytogenes* were again used as indicators for other LAB bacteriocins that did show inhibition and this cycle was repeated until 3 successive classes of bacteriocins were obtained based on immunity or inhibition of single or multiple Bac<sup>R</sup> strains of *L. monocytogenes*. The PCR array allowed us to obtain successful amplification and DNA sequence information for every bacteriocin tested, finding new bacteriocins whose sequence were not identical to those already residing in GenBank.

The method described allow us to identify different functional “immunity classes” based on bacteriocin resistance screening and a PCR array provided quick amplification and sequence identity of the various structural genes to determine if these bacteriocins were previously studied.

## **Pomegranate juice is effective in reducing inflammatory mediators induced by lipopolysaccharides in RAW 264.7 macrophages.**

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**Presentation Subject Area: Biological Sciences**

Inflammation has been implicated in the pathogenesis of many diseases such as atherosclerosis, osteoporosis, diabetes, and arthritis. Inflammatory mediators regulate and control the inflammatory response. Natural products such as pomegranate are rich source of antioxidants and phenolic compounds that may exert anti-inflammatory properties. The objective of this study was to evaluate the anti-inflammatory effects of pomegranate juice. Murine Raw 264.7 macrophages were incubated in DMEM containing 10%

FBS and 1% penicillin and then supplemented with different concentrations (0, 0.5, 1.0, 1.25, 1.5, 1.75, 2.0, 2.25, 2.5, 2.75, 5.0% v/v) of pomegranate juice for 24hrs. Cells were then stimulated with lipopolysaccharide (LPS) for 24hrs to induce inflammatory conditions. The production of nitric oxide (NO) and cell viability were analyzed using the Griess and Resazurin assays, respectively.

As expected, the addition of LPS caused a significant increase in the production of NO and pomegranate juice starting at 1% juice concentration significantly decreases NO production. Pomegranate juice at concentrations of 2 and 2.5% reduced NO by 50 and 85%, respectively. There was no significant decrease in cell viability up to 2.75% pomegranate juice but goes down by 30% in the 5% juice concentration. Our findings suggest that pomegranate juice exhibits potent anti-inflammatory activities that may potentially help in prevention of inflammatory related conditions.

## **Illiteracy and Crime - Are We Raising Criminals?**

**Theresa Martins**

**Oklahoma State University**

**Presentation Subject Area: Education**

Our nation has been trying to reduce crime since it was born. We have tried hangings, public whippings, electrocutions, incarceration. How are we going to reduce crime? We can reduce crime by increasing literacy. If we are not reaching our children in school and teach them to read, we are raising the criminals of tomorrow. Students are not going to want to stay in school if they do not feel successful. According to both Malmgren and Drakeford, studies have found a direct correlation between participation in educational programs and lower levels of crime and recidivism. Drakeford has told us that low literacy plays a key role in criminal activity. Studies conducted by McCoy have shown that after learning how to read; only 15% of individuals in penal institutions are ever arrested again. Drakeford's studies concur with this. His studies have shown that for every one year gain in reading levels, the recidivism rate drops by 3.5%. The only way to stop the spread of crime is to stop the spread of illiteracy.

## **Satisfaction and Recommendation to Peers among Residence Hall Students**

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**Presentation Subject Area: Education**

This study looks at the relationship between satisfaction and recommendation to peers for residence hall students. The ACUHO-I/EBI Satisfaction Survey is used to gather data from students living in specialty housing units as well as non-specialty housing at Oklahoma State University. A partial correlation is used to analyze the relationship between satisfaction and recommendation, controlling for classification. A comparison is drawn between the specialty housing group and the non-specialty housing group. Results indicate that satisfaction is indeed a significant predictor of recommendation to peers, but classification and specialty housing do not seem to contribute significantly to this relationship.

## **Wavelets and Genetic Algorithms for Spectral Pattern Recognition & Library Searching**

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**Presentation Subject Area: Physical Sciences & Technology**

The fast wavelet-transform and the wavelet packet transform have been used to denoise near infrared spectra in a library to eliminate spectral offsets, sloping baselines, and other noise sources. The library data were analyzed using a genetic algorithm (GA) for pattern recognition. The pattern recognition GA identifies a set of features (wavelengths) that optimize the separation of the classes in a plot of the two or three largest principal components of the data. Because principal components maximize variance, the bulk of the information encoded by the selected features is about differences between classes in the data set. In addition, the GA focuses on those classes and or spectra that are difficult to classify as it trains using a form of boosting to modify the fitness landscape. Boosting minimizes the problem of convergence to a local optimum since the fitness function of the GA is changing as the population is evolving towards a solution. Over time, spectra that consistently classify correctly are not as heavily weighted in the analysis as spectra that are more difficult to classify. The pattern recognition GA learns its optimal parameters in a manner similar to a neural network. The algorithm integrates aspects of strong and weak learning to yield a 'smart' one-pass procedure for feature selection, clustering, classification, and prediction.

## **Feeding Orange Pulp Improves Bone Microarchitecture in Orchidectomized Rats**

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**Presentation Subject Area: Biological Sciences**

This study evaluated effects of enhancing antioxidant status on bone quality in a rat model of osteoporosis. One-year-old retired breeder rats were randomly assigned to *orchidectomy* (ORX) or sham-surgery (SHAM) treatments. Three days post-surgery, ORX rats were assigned to the following treatments: ORX, ORX + 2.5% powdered orange pulp, ORX + 5.0% and ORX + 10% orange pulp. These *isonitrogenous, isocaloric* modified AIN-93M diets with equal fiber content were pair fed for 4 months to the mean intake of SHAM. At the end of the study, blood and bone were collected. Plasma antioxidant capacity was determined spectrophotometrically and bone microarchitecture was assessed using microcomputed tomography. With a significant F statistic by ANOVA, the least square means procedure in SAS (version 9.1) was used to separate treatment differences ( $p < 0.05$ ). Lack of testosterone decreased ( $p < 0.05$ ) antioxidant status while feeding orange pulp as low as 2.5% maintained antioxidant capacity of ORX rats to that of SHAM. In 4th *lumbar trabecular* cores, ORX rats had significantly reduced bone volume fraction, connectivity density, and *trabecular* number and increased *trabecular* separation. Five percent orange pulp tended and 10% orange pulp significantly increased ( $P < 0.05$ ) bone volume fraction, *trabecular* number, and decreased *trabecular* separation compared to ORX.

Supported by USDA Grants 2001-52102-02294, 2004-34402-14768, TAMUK Research Council & Okla. Agricultural Expt. Station.

## **Study of Impact of RFID in Reducing Stock Outs and Improving on Shelf Product Availability Using Simulation Based Modeling Approach**

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**Presentation Subject Area: Physical Sciences & Technology**

Radio-Frequency Identification (RFID) is very promising technology which is making waves in the retail industry. Retail industry giants like Wal\*Mart, Target, Albertsons and Tesco have started implementing this technology in their supply chain. It seems every magazine in the area of supply chain has published articles about potential applications of RFID to optimize current supply chain operations. Major areas of improvement are labor cost reduction, inventory shrinkage reduction, fewer numbers of stock-outs and improved product availability on shelves. Consultants and technology experts had made their best estimates about the extent to which these areas will be improved. According to Lee, H. and Ozer, O. (2005), industry experts and technology providers have not gone through full scale analysis of RFID and hence their estimates would be considered as educated but wild guesses. They have also pointed out the need of performing a detailed model analysis rather than rough estimates.

This study takes analytical modeling approach to quantify value of RFID in reducing number of stock outs and in improving product availability on shelves. Our results show that RFID may reduce stock outs up to 100%. Also, there is an opportunity to reduce average store inventory and still achieve zero stock-outs.

## **Cross-species Analysis of the Mammalian Beta-Defensin Gene Family: Presence of Syntenic Gene Clusters and Preferential Expression in the Male Reproductive Tract**

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**Presentation Subject Area: Biomedical Sciences**

Mammalian beta-defensins are an important family of innate host defense peptides with pleiotropic activities. As a first step to study the evolutionary relationship and biological role of the beta-defensin family, we identified their complete repertoires in the human, chimpanzee, mouse, rat, and dog following systemic, genome-wide computational searches. Although most beta-defensin genes are composed of two exons separated by an intron of variable length, some contain an additional one or two exons encoding an internal pro-sequence, a segment of carboxy-terminal mature sequences or untranslated regions. Alternatively, spliced isoforms have also been found with several beta-defensins. Furthermore, all beta-defensin genes are densely clustered in four to five syntenic chromosomal regions, with each cluster spanning <1.2 Mb across the five species. Phylogenetic analysis indicated that, although the majority of beta-defensins are evolutionarily conserved across species, subgroups of gene lineages exist that are specific in certain species, implying that some beta-defensins originated after divergence of these mammals from each other, while most others arose before the last common ancestor of mammals. Surprisingly, RT-PCR revealed that all but one rat beta-defensin transcript are preferentially expressed in the male reproductive tract, particularly in epididymis and testis, except that Defb4, a human beta-defensin-2 ortholog, is more restricted to the respiratory and upper gastrointestinal tracts. Moreover, most beta-defensins expressed in the reproductive tract are developmentally regulated, with enhanced expression during sexual maturation. Existence of such a vast array of beta-defensins in the male reproductive tract suggests that these genes may play a dual role in both fertility and host defense.

## **Predicting Teaching Styles of Title One Teachers**

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**Presentation Subject Area: Education**

The aim of this study was to determine if Title One teachers' teaching style can be predicted by age, experience, and educational philosophy; Liberal Adult Education, Behaviorist Adult Education, Progressive Adult Education, Humanistic Adult Education, and Radical Adult Education. The sample consisted of 169 Title One teachers in Oklahoma. A Stepwise Regression analyses was performed on the five factors. It was determined that Liberal and Humanist philosophies accounted for approximately 21% of the variance in teaching styles.

## **Hotel design: Featuring sustainable design and waste reduction**

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**Oklahoma State University**  
**Presentation Subject Area: Environmental Sciences**

Recently, there has been an increase in news about environmental problems. Sadly to say, earth's environment is depleting and the main species that causes the most harm toward it are humans. Mankind is the only species that uses materials to create necessary tools for their survival and at the same time is the only species that produces waste and toxins.

In order for the environment to last longer sustainability is necessary. According to McDonough (2002), sustainability is using materials and resources, especially non-renewable, wisely to meet the needs of the present generation without compromising the ability to meet the needs of future generations.

There are many ways to implement sustainability guidelines. However, the focus of this research is in hospitality industry, especially hotels. According to Budeanu (2002) tourism will grow faster than society expects and will double in 20 years. However, rapid development will bring some negative aspects that will affect nature, communities, culture, and society. Budeanu (2002) also stated that tourism's main impact on nature is global warming.

There are several ways to protect the environment. According to LEED (n.d.), the ways for a building to apply sustainable principles is by using resources like energy, water, and materials wisely, and promote good indoor air quality. However, beside LEED guidelines, the principles of Cradle to Cradle, developed by William McDonough and Michael Braungart, are used especially when separating biological and technical nutrients. According to McDonough and Braungart (2002), biological nutrients area materials or products that are designed to return to nature. The idea behind this is the products falling in this category are made up of materials that can be safely tossed away on the ground and in a couple of hours or weeks the product will decompose and return to the soil safely. On the other hand, technical nutrients are those materials or products that are designed to go back to the technical cycle, into the industrial metabolism from which it came from. The idea behind this is for an individual "buying" a product, but the ownership of the product is the company that produced it. As a result, when the consumer is done with the service of the product they can return it to the company who developed it.

Furthermore, the setting for this hotel will be in downtown areas. Just to mention few examples of

how LEED and Cradle-to-Cradle principles were implemented products like towels and blankets to use are 100% cotton or any other fiber, but blends will not be used. For wise water usage toilets specified are the ones that uses 1.6 gallons of water, faucets will have sensor motion activation, and showers head will use 2.5 gallon per minute of water.

The importance of this research is because there has been an increase in interest on this type of topic, and the recent news of oil consumption that people are facing now, and society trying to look for other alternatives for energy production.

### **“D”and “T” Production: A Comparison of a Native English, a Native Spanish, and a Spanish-English Bilingual 4-year-old Child**

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Presentation Subject Area: Biological Sciences**

To better understand the second language acquisition process for English monolingual, Spanish monolingual, and English-Spanish bilingual children their abilities to differentiate the lingua-dental, lingua-alveolar voiced, and lingua-alveolar voiceless phonemes in novel settings must be researched. Therefore, three 4-year-old participants were used for this study. The first participant was a native Spanish speaker, the second an English-Spanish bilingual speaker, and the third a native English speaker. Pilot data was collected during the session with each child through camera recording, voice recording, and IPA transcription. Thorough computerized, digital, auditory, and visual analysis of the data led to results that were hypothesized by the researcher. In producing novel words, the bilingual child produced both *lingua-alveolar* stops and *lingua-dental* stops with less accuracy.

### **Grazing and Endophyte Presence on Tall Fescue Seed Production in the Southern Great Plains**

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Presentation Subject Area: Biological Sciences**

Most tall fescue (*Festuca arundinacea Schreb.*) seed is produced along the Pacific Northwest coast of the USA and sold as certified seed. In several states including Missouri, Arkansas, and Kansas, producers manage their tall fescue for pasture and hay, as well as a seed producing crop sold as common tall fescue. In Oklahoma, spring grazing is the primary use for tall fescue, but seed production could represent an additional value for the crop. Most currently used tall fescue cultivars are infected with an endophyte (*Neotyphodium coenophialum*). Cattle production is often diminished, but forage competitiveness is increased with endophyte-infected tall fescue. This study was conducted to determine if fall grazing is compatible with seed production and quality using endophyte-free and endophyte-infected tall fescue cultivars and to understand the relationship of total seed yield with seed yield components.

Materials and Methods. Fall grazing and no grazing using four tall fescue cultivars were investigated during 2003 and 2004. The tall fescue cultivars used in the study were Dovey (E-) and Georgia 5 (E-) (endophyte-

free), and Georgia 5 (E+) and Kentucky 31 (E+) (endophyte-infected). The design structure was a randomized complete block with a split plot arrangement of treatment combinations. Main plots were cultivars and subplots were grazing methods. Because of contrasting weather conditions during the two years of the study, differences in means and variances were observed. Thus, individual statistical analyses for each of the two years were performed. Dovey (E-) produced little seed in either year regardless of grazing treatment and it was removed from the analyses.

Results and conclusions. Seed yield and quality in 2003 was extremely low (34 kg of seed ha<sup>-1</sup> and 54 % seed germination) because of dry weather during the time of seed development. However seed production from fall grazed tall fescue was 70 % larger than non grazed tall fescue. In contrast, grazing had no effect on seed yield in 2004 but cultivars had. Georgia 5 (E-) had a similar seed yield as Georgia 5 (E+) and Kentucky 31 (E+) with a mean seed yield of 287 kg ha<sup>-1</sup>. Averaged across treatments, seed germination was 89 %. The relationship of seed yield components to seed yield depended primarily upon environmental conditions. In general, tall fescue seed either increased yield and quality or was not affected by fall grazing. Georgia 5 (E-) appears to be a promising cultivar for the southern Great Plains that produced similar seed yields and quality to the traditional endophyte-infected cultivar Kentucky 31 (E+).

## **Improved Synthesis and Characterization of 3,6-Dibromophenanthrene**

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**Presentation Subject Area: Physical Sciences & Technology**

A current project required the organic compound 3,6-dibromophenanthrene. This compound is of interest because the distance between the bromine groups is similar to that of the double dimmer rows of the Si(100) surface. The similar spacing may permit adsorption of the compound on this surface in an orderly manner. Our goal is to study the reactions of this dibromophenanthrene derivative on the Si(100) surface. Information obtained by investigating these reactions may be useful in the design of microcircuits and sensors.

A previously published synthesis of this dibromide did not proceed as reported. Thus, we have modified the reaction procedures in the reported synthesis to afford a reproducible synthesis of this material. Additionally, we have characterized each intermediate in the synthesis by IR, 1H-NMR, 13C-NMR and MS.

## **An Examination of Customer Service Employees' Self-Efficacy, Job Satisfaction, and Customer Perception of Hotel Service Quality**

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**Presentation Subject Area: Social Sciences**

The current business environment is one of increased international competition, slower growth rates and mature markets (Fornell, 1992). Many organizations are making customer perception of service quality a priority, in order to retain customers and stay competitive (Berry, 1995). The purpose of the study is to

determine which among the independent variables of customer service employee's self-efficacy, and job satisfaction are predictive of customer perceived service quality. This study also attempts to determine levels of self-efficacy of customer service employees of hotels according to demographic factors of age, gender and education background. Population samples are collected from three 5-star hotels in Bangkok, Thailand. The sample targets in the study are 250 hotel customer service contact employees and 250 customers. Among the hotels chosen, a random sample of employees is obtained from hotel units such as front desk, food and beverage, housing keeping, maintenance, security, and bell-staff. Customers surveyed will guests or visitors who have experienced hotel services for at least three days. Basic descriptive statistics of means, standard deviations, and ranges of variables, and reliability coefficients ( $\alpha$ ) are also calculated, and are used to examine data outliers. The research questions are tested using a multiple regression technique.

### **Passive Transfer of Naturally Acquired Antibodies to *Actinobacillus Equuli* Toxin from Mares to Foals**

**Clayton Smith, Ruenette Boyette, Sahlu Ayalew, Marie Montelongo, G. Reed Holyoak, Jordan D. Hammer, and Anthony W. Confer**  
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**Presentation Subject Area: Biomedical Sciences**

*Actinobacillus equuli* is a major cause of neonatal foal septicemia. Little is known about immunity to the bacterium. *A. equuli* has two subspecies, *A. equuli* subsp. *equuli* and *A. equuli* subsp. *haemolyticus*. The latter subspecies secretes an RTX toxin, *A. equuli* toxin (Aqx), whereas *A. equuli* subsp. *equuli* does not. The objective of the study was to examine sera from mares for the presence of antibodies against Aqx that were acquired from natural exposure to the bacterium, and to determine if there was passive transfer of anti-Aqx antibodies to their foals. Sera from 18 mare-foal pairs were examined using an enzyme-linked immunoabsorbent assay (ELISA) to test for antibodies against recombinant Aqx (rAqx) toxin. The rAqx was cloned, expressed, and purified in a prokaryotic expression system. Sera from 16 of 18 mares contained readily measurable anti-rAqx at all time periods of the study. Immediately after birth, anti-rAqx was not detected in sera from any of the foals. Twenty-four hours after birth and after foals had nursed, measurable amounts of anti-rAqx were detected in foals from mares that had detectable serum anti-rAqx antibodies. Foal sera varied substantially in peak antibody concentrations. In conclusion, mares can be naturally exposed to *A. equuli* subsp. *haemolyticus*, which results in spontaneous production of antibodies to the Aqx toxin. Those antibodies can be passively transported to their foals via colostrum.

### **Psychology Students' Perceptions of Psychology as a Science: Differences Between Psychology Majors and Minors and Classification Status.**

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**Presentation Subject Area: Social Sciences**

Psychology Students are exposed to the scientific method and procedures for testing psychological phenomenon through various psychology courses. One scale that has been used to measure student's

perceptions of psychology as a science is the Psychology as Science (PAS) scale. Previous research has looked at the PAS and found it to be reliable (Friedman, 1996). The purpose of the current study was to 1) replicate the reliability of the PAS, and 2) assess whether perceptions of psychology as a science differ between psychology majors and minors and if they differ based on classification (i.e. freshman, sophomore, junior, or senior status). This study included 19 psychology minors and 90 psychology majors. Students were administered the PAS along with other questionnaires not included in this study. Our results showed that the PAS was reliable, cronbach &#945; = .80. However, there were no significant differences in perceptions of psychology as a science between psychology majors and minors ( $p > .05$ ). Additionally, perceptions of psychology as a science were not significantly different between students of different classifications ( $p > .05$ ). Psychology majors and minors, on average, showed moderate to high ratings of psychology as a science. Also, regardless of classification, most participants showed moderate to high ratings of psychology as a science. These findings indicate that most psychology students view psychology as a science. Given that students at every level tend to have similar views of psychology as a science, their views may not be tied to having taken a specific experimental methods course. Future research should be conducted to view the relationship between PAS ratings and students' understanding of science and their exposure to other types of science courses and training.

## **Anxiety, Role Strain, Caregiver Burden, and Coping in Husbands of Women with Breast Cancer**

**Loukisha Sweat, Silvia Bigatti, and Jennifer Lydon**

**McNair Scholars Program from Indiana University-Purdue University Indianapolis**

**Presentation Subject Area: Social Sciences**

Breast cancer is an invasive disease, which disrupts and threatens the lives of many women and their families. Previous literature reveals that spousal caregivers of women with breast cancer may experience increased psychological distress compared to spouses of healthy women. There is a growing body of literature examining the psychological needs of spousal caregivers. The purpose of this study is to examine the relationship between anxiety, role strain, caregiver burden, and coping in husbands of women with breast cancer. Participants will include husbands of breast cancer patients ( $n = 83$ ) receiving chemotherapy at the Indiana University Cancer Center. The tension-anxiety subscale of the Profile of Mood States (POMS) short form will be used to assess anxiety, the Psychological Adjustment to Illness Scale-Spouse Report (PAIS) will be used to assess role strain, and the Illness Impact Form will be used to assess caregiver burden. Additionally, the Ways of Coping Questionnaire will be used to assess coping strategies. Upon completion of data analysis, we expect to find that (a) higher levels of burden will be associated with greater anxiety and role strain and (b) that emotion focused coping will be associated with greater anxiety and role strain than problem focused coping.

## **Infant Growth and Brain Development in Southern Ethiopia**

**Vladimira Sykova, Kennedy T, Thomas D, Hubbs-Tait L, Stoecker B, Wogene T, Abebe Y, Krebs N, Hambidge M**  
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**Presentation Subject Area: Biological Sciences**

Infant visual recognition memory is a measure of attention, memory and information processing speed that predicts IQ, language and vocabulary. Visual memory was assessed using a videotaped novelty preference paradigm. One-hundred infants 6-8 months of age in southern Ethiopia were presented with graphic stimuli and evaluated on standard anthropometric measures. Duration of looks and shifts in looks between stimuli were coded from the tape and novelty preference determined. Inter-rater reliability was  $> 0.80$  for both duration of looks and familiarization shifts and  $0.56$  for test shift rates. Growth data were converted to z-scores. Sixty-nine infants completed at least three novelty preference trials (5 second minimum look at stimuli). Infants were 7.2 months of age (SD 0.91) and were growth retarded: mean weight for age z-score  $-1.12$  (SD 1.19), length for age z-score  $-1.05$  (SD 1.31). Mean head circumference was within a normal range (z-score  $.06$ ; SD 1.52). Infants demonstrated a preference for the familiar stimuli ( $.39$ ;  $p=.000$ ) as opposed to the expected preference for the novel stimuli, indicating a developmental delay. Although novelty preference was not associated with any specific measure of growth, longest look to stimulus during familiarization was negatively associated with weight for age ( $r = -0.320$ ,  $p = 0.007$ ), indicating that processing speed increased (shorter look) as z-score improved. In conclusion, infants were growth retarded with a significant disturbance in the development of novelty preference. We are confident in this observation as processing speed, as demonstrated by longest look to stimulus, showed the anticipated association with growth.

## **Relationship between Infant Visual Recognition Memory and Maternal Anthropometry.**

**Vladimira Sykova, Kennedy T, Wogene T, Thomas D, Abebe Y, Hubbs-Tait L, Stoecker B, Krebs N, Hambidge M**  
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**Presentation Subject Area: Biological Sciences**

Infant visual recognition memory, a measure of attention, memory and information processing speed, predicts IQ, language and vocabulary. This study examined relationship between infant visual recognition memory and maternal anthropometry. Visual memory was assessed using a videotaped novelty preference paradigm. One-hundred infants 6-8 months of age in Ethiopia were presented with graphic stimuli. Duration of looks and shifts in looks between stimuli were coded from the tape by two independent teams and novelty preference was determined. Sixty-nine infants completed at least three novelty preference trials. Infants' mothers were evaluated on weight, height, and BMI. Relationship between maternal anthropometry and infant novelty preference measures were analyzed using ANOVA. Maternal height is positively correlated with infant weight-for-age z-score ( $r=0.207$ ,  $p=0.039$ ), infant length-for-age z-score ( $r=0.366$ ,  $p=0.000$ ), infant head circumference ( $r=0.199$ ,  $p=0.048$ ), and infant head circumference z-score ( $r=0.225$ ,  $p=0.025$ ). Statistical analysis did not show any consistent relationship between maternal anthropometry and infant novelty preference variables. Although maternal height and infant anthropometric measures were correlated, maternal anthropometry cannot be used as a predictor of infant novelty preference. This study is a part of a project funded by NIH grant #NIH 5 R21 TW006729.

## **An Innovative Approach to the Study of Intra-Cellular Signaling Processes**

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**Oklahoma State University**

**Presentation Subject Area: Physical Sciences & Technology**

Ion channels pass small Ca<sup>2+</sup> currents that are capable of stimulating a hierarchy of intracellular calcium signals, thereby regulating a wide variety of critical bioprocesses. The current technology for the study of ion channels is the patch-clamp electrophysiology technique. The bulky size of the pipette tips used in patch-clamp studies inhibits the interfacing of multiple pipettes to the same ~10µm diameter cell. Such studies are required to investigate how the time delay and spatial separation between different ion channel currents affect the propagation of cellwide calcium signals, particularly in the lesser understood smooth muscle cells. Here we report on the directed growth of single crystal metallic wires from macroscopic electrodes to targeted sites on cultured muscle cells. This capability provides an innovative way to interface multiple wires to a single cell, enabling the future study of how the timing and proximity between different electro-stimulated calcium currents affects the subsequent, cell-wide signaling processes.

## **Effects of Mowing on Species Richness and Composition of an Oklahoman Grassland Community over a Nine Year Period.**

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**Oklahoma State University**

**Presentation Subject Area: Biological Sciences**

We report an experimental study of effects of mowing on an Oklahoman grassland community. An experimental plot was mowed regularly on an annual basis at three different frequencies and seasons for a period of nine years. Data for species richness and composition were collected for five year during early summer. Species richness was always enhanced by mowing, however increasing frequency or seasonal effects were not observed. We applied Redundancy Analysis (RDA), an ordination method for analyzing the effects on species composition. The RDA showed that control (unmown) plots differ greatly from the mowed plots in species composition largely because mowing selects for plants with short stature, prostrate habit or perennial life-history. RDA also indicated that in long-term mowing experiments, the species compositional changes are affected more strongly by time-period of mowing than by frequency of mowing. A p-RDA (partial redundancy analysis) using mowing frequency as a covariable revealed strong long-term effects with recent most two years species composition represented entirely by perennial grasses. We conclude from this study that mowing has a selective effect on species, mostly decided by the height of the mower blade during initial years. Over a longer period of time mowing strongly enhances the abundance of perennial grasses, thus changing the composition of grasslands dramatically.

## **Intranasal Vaccination of Rabbits with *Mannheimia haemolytica* Outer Membrane Lipoprotein PlpE, Leukotoxin (LKT) and a Chimera PlpE-LKT Protein.**

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**Presentation Subject Area: Biomedical Sciences**

*Mannheimia haemolytica* (*M. haemolytica*) is the most common cause of severe bacterial pneumonia and eventual death in stressed cattle (Shipping Fever). Currently available commercial vaccines are efficacious approximately 50% of the time. Therefore, better vaccines are needed against this disease. Immunity against *M. haemolytica* requires antibodies to surface antigens and antibodies that neutralize the leukotoxin (LKT). One of the most immunologically important surface antigens is an outer membrane lipoprotein termed PlpE. For this study, we tested a recombinant protein expressed from a chimeric gene expressing the major epitope region of PlpE and the LKT region that stimulates neutralizing antibodies. We have previously seen that parenteral vaccination of cattle and mice with the chimeric PlpE-LKT protein (SAC89) was immunogenic and stimulated dose-related antigen-specific serum antibody responses. Because *M. haemolytica* first colonizes the nasal passages before colonizing the lungs and causing pneumonia, we undertook this project to determine if intranasal vaccination with SAC89 would stimulate nasal and systemic antibodies that would opsonize the bacterium and neutralize LKT. The purpose of this study was to determine the nasal and serum antibody responses of rabbits following intranasal immunization with 10-fold doses of PlpE, LKT, or chimera SAC89 with Cholera-toxin as the chosen adjuvant. The study utilized 30 rabbits distributed among four major groups. Each major group, except for the control group, contained three subgroups of three rabbits each; equaling a total of nine rabbits per group. The subgroups were each given a dosage concentration of either 1 (,g/ml), 10 (,g/ml), or 100 (,g/ml) of the chosen antigen. The rabbits were vaccinated intranasally on days 0 and 19. Sera and nasal secretions were collected on days 0, 7, 14, 21, and 28 during the study. Nasal IgA and serum IgG antibodies against PlpE, LKT, and the chimera PlpE-LKT were determined. SAC89 demonstrated a general antigen-specific antibody response in serum IgG and nasal IgA when tested against LKT, PlpE, and the PlpE-LKT chimera. The nasal vaccine evokes both a nasal IgA response and serum IgG response in rabbits. And all three vaccines demonstrate dose responses to IgG and IgA.

## **Expression of Genes Unique to the QpH1 Plasmid of *Coxiella burnetii* During Infection of Host Cells**

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*Coxiella burnetii* is an obligate intracellular bacterium that is the causative agent of acute Q fever, as well as chronic diseases. Four distinct plasmids (QpRS, QpH1, QpDV, and QpDG) have been isolated from different *C. burnetii* strains and have been implicated in influencing disease outcome (chronic vs. acute), depending on the plasmid type carried by the pathogen. The plasmids have been described as “cryptic”, as the functions of their proteins are largely unknown. These plasmids possess a variety of shared and unique open reading frames (ORFs). Seven ORFs unique to the QpH1 plasmid were identified by sequence comparisons of the plasmids. They are designated ORFs QpH1 p15, p16, p17, p18, p19, p20, and p21. QpH1 p19 lies within the larger QpH1 p20 and in the opposite orientation on the genome. In this study we began the characterization of expression and transcriptional patterns of these ORFs during *C. burnetii* Phase II infection of host cells. Total RNA was isolated from rabbit kidney (RK13) cells heavily infected with *C.*

*burnetii* Nine Mile phase II. The RNA was analyzed utilizing Promega's Access Quick RT-PCR kit using PCR primers designed within the unique ORFs of the QpH1 plasmid. To determine whether QpH1 p15→p16, p18→p17, p20→p18, and p21→p20 were transcriptionally linked, reverse primers were designed within the 5' end of one ORF and forward primers within the 3' end of the ORF upstream. Data indicates that ORFs QpH1 p15, p16, p17, p18, p20, and p21 are expressed during infection. Our results indicate that ORF QpH1 p19 is not expressed during infection. RT-PCR also revealed that ORFs QpH1 p15→p16, and p21→p20→p18→p17, are transcriptionally linked. Six of the putative unique genes (p15, p16, p17, p18, p20, and p21) in QpH1 are expressed during infection. RNA for QpH1 p19 is not produced during an infection. QpH1 p15→p16 and p21→p20→p18 are transcriptionally linked, representing two separate transcriptional units (operons), respectively. Temporal expression analysis of these unique plasmid ORFs as well as protein localization will add to our understanding of this obligate intracellular pathogen.

## **Differential Analysis of Gene Expression during Adipogenesis in Cattle**

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**Presentation Subject Area: Biological Science**

Genetic regulation of *adipogenesis* is of considerable interest in both animal agriculture and in humans. As part of a larger project on understanding the differential regulation of *adipogenesis* in cattle, we have constructed an adipose tissue specific cDNA library and have sequence analyzed ~4000 individual clones. A non-redundant subset of 1050 clones was used to generate an adipose tissue specific cDNA microarray. Using this microarray, we studied differential gene expression profiles in a primary cell culture system derived from bovine subcutaneous adipose tissue. RNA was collected from the cell cultures at different time points (0, 6, 12, 24, 48, 72, 120h) post induction and expression profiles were analyzed using the microarray. Results of the microarray analysis show that approximately 100 genes are differentially expressed during the differentiation process. Microarray data were validated using two transcripts with significant fluctuations in expression and qRT-PCR.

## **The Effects of Increased Cognitive Load, Sociability, and Family History of Substance Use on Delay Discounting**

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**Presentation Subject Area: Social Sciences**

Past research indicates that individuals with a family history of a substance use disorder are at increased risk for substance use disorders of their own. Likewise, low sociability, as measured by the Socialization Scale on the California Psychological Inventory, also appears to be linked with increase risk. Recent research in the field of behavioral economics, has demonstrated that delay discounting, a temporal choice task, differentiates drug-using and non-drug-using individuals, and one study has found that sociability but not family history (FH) was a significant predictor of delay discounting. Therefore, the present study sought to answer the following: Does family history of a substance use disorder or sociability have an independent,

additive, or interactional relationship with temporal choice making? Two hundred and fifty-one participants (188 females) completed online measures of family history of substance use, sociability, current problem drinking, and delay discounting. Analyses indicated that sociability alone but not FH alone predicted two-choice discounting; however, there was an additive effect, whereby sociability together with FH accounted for significantly more variance than sociability alone. The overall additive model suggest that FH is only significant in the context of sociability, and that groups who are high in sociability and FH+ discount delayed rewards less than groups who are low in sociability and FH-. Furthermore, no interaction was found between FH and sociability.

## **Using Geographic Technologies in Prospect Identification**

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**Presentation Subject Area: Social Sciences**

The Oklahoma State University Foundation's mission is to unite donor and university passions and priorities to achieve excellence. To help accomplish this mission, the Oklahoma State University (OSU) Foundation's development practices are designed to effectively manage the identification, qualification, cultivation, solicitation and stewardship activities of individuals, corporations, foundations and other prospects determined as having the interest and capability of making a major gift to OSU. Unrealized assets among many organizations, including the OSU Foundation, are cartography and Geographic Information Sciences (GIS). Cartography and GIS can be useful within philanthropically-based organizations for analyzing spatial patterns of giving and strategic planning and coordination. This project involves the creation of an atlas to be utilized by the OSU Foundation and the OSU Alumni Association to aid in strategic planning and the identification of new prospects and future Alumni Chapters in the contiguous US. The atlas will include general maps of OSU Foundation major gift donors, which will be used to provide reference and insight for the OSU Foundation Development Team during strategy sessions and coordination planning. The maps will include not only the location of OSU prospects, but will rank the prospects according to their giving history to OSU. By incorporating a ranking scheme, development staff will be able to better prioritize and plan trips, as well as recognize possible giving patterns and future opportunities across the country. Additional maps will involve more in-depth analysis and bivariate mapping techniques to identify new prospects. To do this, OSU Foundation donors will be overlaid on OSU alumni to discover geographic pockets, or areas where the OSU Foundation Development Team should focus and begin cultivating new donors. These are places in which alumni are present, but there is an absence of donors and OSU giving. OSU alumni will also be analyzed and compared to current Alumni Chapters. Again, by mapping the two related variables, it will be possible to discover areas that may benefit from establishing an Alumni Chapter where one is not already present. The atlas will be a useful tool in analyzing patterns of potential giving and development.

## **Would you Hire a Student that Earned a Bachelors Degree Totally Online?**

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**Presentation Subject Area: Education**

The purpose of this paper is to investigate and compare the learning outcomes of teaching and delivering Business Communications courses via on-campus instruction, online instruction, and compressed video instruction. In addition, the benefits and limitations involved in the instruction (teaching as well as learning) will be discussed.

The question which will be researched is whether there is a significant difference in the learning, which occurs in these three modes of delivery. The null hypothesis being tested in this study is that there is, in fact, no significant difference in learning between or among the three delivery methods. This null hypothesis will either be accepted or rejected.

The methodology used in this study includes scores from written letters, scores on research papers, and oral presentation grades. The data collected represents classes taught in the spring semester of 2004. When comparing scores, only the students who actually completed all three segments were used as subjects.

A review of the literature will be used to support or contradict the hypothesis. It will examine other similar studies and will promote ideas for recommendations and future studies related to this topic and the various delivery methods.

Some of the issues to be discussed will be:

Are the three methods of delivery measuring the same skills equally?  
What theoretical perspective (epistemology) will inform the study?

I will explain how the theoretical perspective will inform the research design, methodology and the reading of the data. I will explain the purpose of the research practices grounded in this perspective serve and what strength and weaknesses they will carry with them. Are the comparisons objective or subjective? How can the assessment instruments used be made more uniform for the three delivery methods? The results of this paper will hopefully help us in the upcoming revision of this course.

## **Boundaries of Change: The Enclosed Landscape of the Choctaw Nation, Indian Territory**

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**Oklahoma State University**  
**Presentation Subject Area: Social Sciences**

The Choctaws settled the southeastern portion of what is now Oklahoma during the early- to mid-1830s as a result of the federal policy of Indian Removal. Soon after arriving the Choctaws began recreating with considerable success their government, developed a strong educational system, and repeated their successful farming practices until the destruction brought about by the Civil War. The residents of the postbellum Choctaw Nation began rebuilding these institutions a second time while simultaneously contending with the large scale influx of Anglos, the emancipation of slaves, and railroads' all of which dramatically altered land use practices. Although scholars have given considerable attention to the political and economic history of

the Choctaw Nation, very little work exists on its historical geography, particularly the material culture which provides diagnostic clues for investigating settlement patterns and human-environment interaction. This lack of attention comes despite the meticulous surveys conducted in the nation by the General Land Office in conjunction with the United States Geological Survey from 1895 to 1898 in preparation for allotment by severalty. These surveys offer the oldest, most detailed look at the historical cultural landscape of the Choctaw Nation. This study presents the reconstruction of the physical and cultural geography of the Choctaw Nation primarily through public land survey plats and field notes on the eve of allotment. It shows the influence that natural resources, transportation, industry, and terrain had on settlement using fence construction as a cultural index, addresses the changing nature of agricultural land use, and poses the question of the degree to which cultural preferences prevailed.

## **Dietary Effects on Metabolic Cost and Duration of Digestion in an Omnivorous Lizard**

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**Presentation Subject Area: Biological Sciences**

The total energy budget of an organism can be divided into costs associated with growth, activity, digestion, and energy costs required for sustaining life, commonly referred to as 'maintenance' costs. Individuals differ in how they allocate energy to each of these variables. For example, energetic costs associated with digestion (specific dynamic action; SDA) may depend to a large degree on the composition of individuals' diet. The effects of diet on the metabolic cost of digestion can be determined by measuring metabolic rate (MR) while experimentally controlling growth, activity, and maintenance. Understanding the inter- and intrasexual degree of variation in costs associated with diet choice can be instrumental in understanding ontogenetic diet shifts within species, and differences in foraging strategies among species. We plan to measure diet effects on SDA in a representative omnivorous agamid lizard, *P. vitticeps*. Lizards for this experiment will be obtained from eggs produced by 2-3 females. After a winter cooling cycle, these females will be bred with a single male in order to minimize genetic variation. Once the eggs are laid, they will be incubated in a constant-temperature incubator at 29°C. During embryonic development oxygen consumption will be measured to determine the energetic cost of development, and then at frequent intervals after hatching to measure the metabolic cost and timing of yolk absorption. At one month of age the juveniles will be fasted prior to being fed meals of known quantity of either animal protein or plant material. Metabolic rate will be measured during the fasting period to determine when the post-absorptive state is reached, then twice daily following feeding until the metabolic rate returns to the baseline. These measurements will be used to compare the intraspecific effects of omnivory versus herbivory on SDA and duration of digestion.

## **Evidence for Anti-inflammatory Effects of Genistein**

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**Presentation Subject Area: Biomedical Sciences**

Osteoarthritis is the most common joint disorder, especially afflicting the elderly (individuals in their 60s and older), yet relatively little is known of its etiology. Evidence suggests that soy protein decreases joint pain and improve joint mobility. However, the active constituent(s) of soy that provides relief has not yet been investigated. There are various bioactive compounds in soy that may contribute to the attenuation of osteoarthritic symptoms; these include its antiestrogenic properties and the stimulation of insulin-like growth factor-I (IGF-I), known to improve cartilage regeneration. The purpose of this experiment is to examine the extent to which genistein, a soy isoflavone, mitigates antiinflammatory response in cell culture. However, for establishing methodologies, the present experiment uses macrophages. For this purpose, *lipopolysaccharide* (LPS) is used as an inflammatory agent and the effectiveness of genistein is being assessed by measuring the production of proinflammatory molecules, e.g. nitric oxide, *cyclooxygenases* 1 & 2 (COX-1 and COX-2), and interleukin-1&#61538;. So far, any of the doses of genistein varying from 5 to 200 mg/ml medium has neither affected cell viability nor nitric oxide production. Further analyses are being conducted to confirm the antiinflammatory effects of genistein by measuring COX-1 and COX-2. Ultimately, we will be testing the same things using *chondrocytes* which will be obtained from human cartilage specimens.

## **American Postmodernism in the Works of Haruki Murakami**

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**Presentation Subject Area: Humanities**

One of the most peculiar developments in Western culture over the past hundred years is the phenomenon known as Postmodernism--a slippery, difficult-to-grasp concept unique to cultural studies. Encompassing cultural expressions as diverse as architecture, film, fashion, and literature, Postmodernism primarily concerns itself with the destruction/rewriting of cultural standards and ethics, with a strong emphasis on religion, politics, and information.

Until quite recently, Postmodern expression has largely been limited to American and European cultures. However, after World War II and the American occupation of Japan, the anger, apathy, and despair expressed by many Japanese artists died down in favor of an American-style cultural eclecticism. Eschewing a historically strict society's rules, a few figures have continued to undermine Japanese biases and traditions with their work.

Prominent among these figures is Haruki Murakami. Child of a supremely normal household and adolescence, his novels have climbed bestseller charts and best-of lists even as they become gradually more metaphysical. Gone from his works are the Japanese obsessions Honor and Humility. In their place are concerns about the brutality of war, a series of absurd quests, and questions about the nature of reality.

In my project, I have examined Murakami's novels in the context of postmodern American literature, attempting to quantify the overall impact of American culture on his worldview. Beyond the typical earmarks of Postmodernism, other signifiers such as American song names, references to American

celebrities, and an easily translatable Japanese voice pinpoint Murakami at the heart of Japan's postmodern movement.

## **ACT performance through the Lens of Self-Efficacy**

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**Presentation Subject Area: Education**

Self efficacy is an individual's judgment of personal capabilities to organize and execute levels of performances that influence events which affects their daily living. Several researchers believe that self efficacy holds significant power for predicting and explaining academic performance in various domains (Lent, Brown & Larkin, 1986; Marsh, Walker & Debus, 1991; Pajares, 1996; Schunk, 1989; 1991). According to theory and research, Bandura acclaims that self efficacy is based on a three-way interaction of behavior, cognitive factors, and environmental factors. These factors influence each other. Bandura has labeled as "triadic reciprocity" (Bandura, 1977; 1986; 1995; 1997).

The purpose of the current study is to see whether self-efficacy was closely related to students' American College Testing Assessment (ACT) performance so that the determinants measuring self-efficacy could be used to predict their ACT performance. The determinants applied in this study were taken from Bandura's (2005) Children's Self-Efficacy Scale. The participants of this current study were 50 (male=20; female=30) junior or seniors from predominantly White, middle-class public schools across Oklahoma and they were attending a day-long university-sponsored ACT preparation workshop. The workshop coordinator facilitated completion of the survey among the students who had agreed to participate in the study and who had returned parental or guardian permission slips. Data were analyzed using both descriptive and inferential measures.

The findings of this study were that gender did not significantly contribute to the differences in the subsections of ACT among students. Among the determinants of self-efficacy, to meet others' expectation was correlated significantly ( $\alpha=.01$ ) with other determinants expect for the self-efficacy for social resources. Self-regulated learning was correlated significantly at the .05  $\alpha$  level with the other determinants expect for social resources and self-assertive. The overall F-value was statistically significant at  $\alpha=.05$  for the prediction of total ACT scores from the nine determinants of self-efficacy and only the unique contribution of self-efficacy for academic achievement and self-efficacy for enlisting parental support were statistically significant.

## **Estimating State Per Capita Personal Income in U.S.: A Panel Data Approach**

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**Presentation Subject Area: Social Sciences**

This paper investigated the relationship of the state per capita personal income (PCPI) with its determinants, a set of demographic, human capital, industrial mix and racial composition variables by using a panel of 48 contiguous U.S. states over the period 1950-2000. Different model approaches were applied and diagnosed,

Feasible Generalized Least Square (FGLS) approach outperforms others in fitting cross-section time-series linear model in the presence of correlation and heteroscedasticity across panels. Regression results by fitting FGLS into the panel model showed that human capital variables (the percentage of population who had a bachelor's degree and percentage of population who had a high school education) and industrial structure variables (the percentage of population who were employed in manufacturing, mining, constructing, and serving sectors) had significant and positive impacts on state PCPI. In addition, racial composition (the percentage of population that is African-American) and demographic variables (the percentage of population that lived in urban area) had no significant influence.

## **Enhancement of Phosphorus Removal in Bioretention Cell through Soil Amendment**

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**Presentation Subject Area: Environmental Sciences**

Urban stormwater runoff transports a significant level of phosphorus. Bioretention cells are a best management practice (BMP) to control the quantity and the quality of stormwater runoff. However, phosphorus removal has been highly variable in previous research. Batch sorption experiments were conducted to determine the distribution coefficient ( $K_d$ ) of phosphorus in two Oklahoma soils (Teller loam and Dougherty sand) and four other materials (fly ash, peat moss, limestone, and lightweight expanded shale). Fly ash was selected for further detailed experiments because of its highest phosphorus  $K_d$ . With the addition of fly ash, the phosphorus  $K_d$  of both soils were increased significantly. Amended with 5.0% (kg/kg) fly ash, the phosphorus  $K_d$  of Teller loam and Dougherty sand were elevated from 0.41 mg/L and 2.08 mg/L to 49.3 mL/g and 398 mL/g, respectively. Hydraulic conductivity was measured with a falling head permeameter. Hydraulic conductivity was decreased exponentially in Dougherty sand with fly ash content. Sorption isotherms of phosphorus on Dougherty sand, Dougherty sand with 5.0% fly ash (D+5.0%F), and shale were fitted into Freundlich and Langmuir model. From Langmuir model, the maximum sorption capacity of phosphorus is only 23.8 mg/kg for Dougherty sand, but 385 mg/kg for D+5.0%F, and 81.3 mg/kg for shale. The phosphorus desorption of these three materials indicates that Dougherty sand released most of adsorbed phosphorus while the released phosphorus by D+5.0%F is negligible. Flow-through column experiments were conducted on Dougherty sand, D+2.5%F, D+5.0%F, and shale. A linear equilibrium transport model was applied to determine retardation factors by fitting observed breakthrough curves (BTCs). Phosphorus BTC of Dougherty sand suggests that its retardation factor was close to 1. Retardation factor for D+2.5%F, D+5.0%F, and shale was 15.7, 199, and 470, respectively. Thus, the addition of fly ash increases the phosphorus retention capacity of Dougherty sand significantly. The sand/fly ash mixtures are superior to shale regarding phosphorus retention. Incorporation of a sand infiltration layer amended with fly ash in bioretention cell is expected to improve the phosphorus removal dramatically.

## **Effect of Enterodiol and Enterolactone on the Adhesion Molecules in Human Coronary Aortic Endothelial Cells**

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**Presentation Subject Area: Biological Science**

Our earlier studies showed that flaxseed prevent atherosclerosis in ovariectomized hamsters. However, the mechanism and the component(s) by which flaxseed prevent atherosclerosis need to be investigated.

Flaxseed contains significant amount of phenolic compounds, lignan, which is metabolized by the colonic microflora to enterodiol (END) and enterolactone (ENL). In this study, we are investigating the effect of END and ENL on the expression of adhesion molecules, the earliest detectable events in the development of atherosclerosis. For this study, human coronary artery endothelial cells (HCAEC) will be incubated with different doses of END and ENL (0.1, 1, 10, 100  $\mu\text{m}$ ) for 24 hours and then stimulated with tumor necrosis factor (TNF- $\alpha$ ) for 4 hours to induce an inflammatory expression. Cell viability and expression of adhesion molecules will be measured by ELISA and Western Blot.