**BODIPY dyes as novel fluorescent probes for soluble amyloid oligomers**

Annabel Alonso, Nicholas W. Smith, Christopher M. Brown and Sergei V. Dzyuba

McNair Scholar Program
McNair Scholar from Texas Christian University
Subject Area: Biomedical Sciences

Soluble oligomers of amyloid peptides are implicated as one of the main suspects responsible for the occurrence and progression of Alzheimer’s disease, an age-related neuronal dysfunction affecting millions of people worldwide. Molecular recognition of these soluble peptides using small molecules is an important and promising, yet an underdeveloped area of research. Targeting these soluble oligomers using small molecules will constitute a viable and efficient structural and therapeutic approach.

BODIPY dyes are a versatile class of fluorescent dyes that have found numerous applications in chemical and biological sciences. However, their application in Alzheimer-related research has not been reported to date. We have recently discovered that functionalized BODIPY dyes could serve as spectroscopic probes for soluble oligomers of amyloid peptides. This presentation will describe spectroscopic characterization of BODIPY-amyloid interactions and their implications for developing a treatment for Alzheimer’s disease.

**The Role of Glucose in Resistance to Persuasion**

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Subject Area: Social Sciences

Previous research has established a link between glucose and self-control resources as well as self-control and persuasion. Given these established links, the present study proposed a link between glucose and persuasion. Specifically, it was predicted that glucose would serve as a tool to replenishment of self-control resources that would in turn help the individual resist persuasive appeals. The findings of the present study did not statistically support the predicted hypothesis; however, some effects were in the predicted direction. Although the findings did not support the hypothesis, reasons for future studies are discussed.

**High-Temperature Aerogels in the Al2O3-SiO2 system for Thermal Protection**

Denisse Aranda and Dr. Fran Hurwitz

McNair Scholar Program
McNair Scholar from Florida International University
Subject Area: Physical Sciences and Technology

Al2O3-SiO2 aerogels are of interest as constituents of thermal insulation systems for use at high temperatures. Al2O3 and mullite aerogels are expected to crystallize at higher temperatures than their SiO2 counterparts, hence avoiding the shrinkages that accompany the formation of lower temperature SiO2 phases and preserving pore structures into higher temperature regimes. The objective of this work is to determine the influence of processing parameters on shrinkage, gel structure (including surface area, pore size and distribution) and pyrolysis behavior.
A Preliminary Investigation of the Relations between Micronutrients, Neurotoxicants, and Cognitive Development within the First Nine Months of Life

Nicki Aubuchon-Endsley, Afework Bezabih, David G. Thomas, Stephanie Grant, Julia Conder, Katie Knight, Shakibra Scott, & Tay S. Kennedy

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Subject Area: Social Sciences

Studies have documented positive developmental effects of the micronutrients iron and zinc and negative developmental effects of the neurotoxicants lead and cadmium on cognition. However, no known studies have addressed the interactive effects of these four divalent metals on cognitive development or identified which cognitive processes are most sensitive to these effects. Therefore, a longitudinal investigation of several measures of infant cognition in relation to the presence of iron, zinc, lead and cadmium in the blood and milk of nursing mothers is currently underway. The goal of the current analysis was to identify predicted patterns between constructs using preliminary data, within the context of the larger project. Results indicated meaningful relations between hemoglobin, lead, and cadmium and statistically significant relations between these substances and variables thought to moderate the relation between them and cognitive development (i.e., parity and parenting attitudes), which provides initiatory support for project hypotheses.

Isolation and Characterization of Novel Chemolithotrophs from a Sulphur and Sulfide-Rich Anaerobic Spring in Southwest Oklahoma

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Subject Area: Biological Sciences

Chemolithotrophic bacteria that aerobically oxidize reduced sulfur compounds play a crucial role in the cycling of sulfur in the environment. Several chemolithotrophs were isolated from the source sediment at Zodletone Spring (a sulfur and sulfide-rich spring in southwest Oklahoma) source sediment, and from microbial mat sediment (located adjacent to the spring source), using a defined media with thiosulfate, as the sole electron donor, and atmospheric CO₂ as the sole carbon source. The number of thiosulfate oxidizers per gram of sediment (4.6 x 10⁵ bacteria/g sediment in the source sediment and 4.6 x 10⁴ bacteria/g of sediment in the microbial mat sediment) was estimated using the Most Probable Number (MPN) method. Phase contrast microscopy showed that many isolates were rod-shaped. This work will allow for characterization of novel chemolithotrophs that are key players in the sulfur cycle in Zodletone Spring.
Iron-dependent Alterations in Bone Mineral Density and Microarchitecture in a Weanling Rat Model of Iron Deficiency

Christie Backoulou, McKale Davis, Dean Sharp, Yan Wang, Elizabeth Rendina, Yin Lim, Edralin Lucas, Brenda Smith, and Stephen Clarke

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Subject Area: Biomedical Sciences

Diseases of iron metabolism continue to be a major health concern with iron deficiency remaining the most common nutrient deficiency in the United States. Emerging evidence indicates that alterations in iron status are associated with the development of chronic diseases such as cardiovascular disease, diabetes, and osteoporosis. Little is known as to how iron deficiency during adolescence affects the risk for chronic diseases affecting the cardiovascular, neurological, and musculoskeletal systems later in life.

The primary aim of this project is to determine the extent to which dietary iron deficiency affects bone mineral density and microarchitecture during a period of rapid growth using a weanling rat model of iron deficiency. The central hypothesis is that iron deficiency alters bone density and quality by negatively regulating the development of bone forming and resorptive precursor cells. The broader impact of this research includes critical new understanding of iron’s roles in maintaining optimal health.

Personal Implicative Dilemmas and Psychological Well-Being: Translating Grid to Narrative

Stefanie Badzinski

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Oklahoma State University
Subject Area: Social Sciences

Psychologists have long considered emotional distress to be associated with discrepancies between an individual’s ‘actual self’ and ‘ideal self.’ More recently, however, some have argued that self-discrepancies are necessary, but insufficient to account for psychological well-being. Instead, deeper psychological conflicts, known as ‘implicative dilemmas,’ may be more highly associated with negative emotions such as low self-esteem, depression, and anxiety. Implicative dilemmas involve awareness of a discrepancy between the ‘self’ and ‘ideal self,’ as well as an implicit cost associated with becoming more like the ‘ideal self’ in some aspect. This study, based on George Kelly’s (1955) repertory grid theory, utilizes a sentence-completion task to obtain a qualitative look into participants’ psychological space, revealing logical associations that may prevent them from pursuing a desired identity. Case-studies will be presented in which the researcher attempts, in the human science tradition, to understand individual participants’ psychological well-being in light of the patterns revealed in their responses.

Multiple Robot Collision Avoidance

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Subject Area: Physical Sciences & Technology

Collision avoidance in multi-robot environments is a fundamental prerequisite to perform a collective task. In the case of mobile robots, each robot must be able to estimate and communicate its own position with other robots or with a fixed station in order to avoid collision. To avoid the estimation errors of GPS, radio and video-based position sensors which are widely utilized in literature, we use optical sensors to measure the position of each robot. In particular, the working principle of an optical computer mouse is utilized to design and build more accurate and inexpensive position sensors. Once the position has been determined, a collision avoidance algorithm is utilized to forces the robots, which are about to collide, to perform evasive
The Effects of Tanning Beds on the Normal Microbial Flora of the Human Skin

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Oklahoma State University
Subject Area: Biological Sciences

This study investigated the effects artificial tanning beds on the microbial community of the human skin. The human skin has hundreds of species of microorganisms living on it, and among these microorganisms are large numbers of bacteria species called normal flora that live in a symbiotic relationship with the body. Through the process of indoor tanning, one exposes their skin (and their normal flora) to varying concentrations of Ultraviolet light, damaging bacterial DNA and causing cell death. Ten healthy test subjects (all having been exposed to varying concentrations of tanning bed light in the past) were swabbed...
before and after twenty minute tanning sessions. The swabs were then cultured out and cataloged. After a month of data collection, the results showed that an individual’s flora builds resistance to UV light.

**Effects of Mango on Bone Parameters in Mice Fed a High Fat Diet**

Angela Brown, Wenjia Li, Sandy Peterson, Penelope Perkins-Veazie, Stephen Clarke, Brenda J. Smith, and Edralin A. Lucas

Department of Nutritional Sciences  
Oklahoma State University  
Subject Area: Biomedical Sciences

Consumption of a high fat diet is linked to such chronic conditions as: obesity, hyperlipidemia, and diabetes. Although pharmacological options are available for these conditions, they are often associated with side effects. This study was designed to compare the effects of mango to those of fenofibrate (hypolipidemic drug) and rosiglitazone (hypoglycemic drug) on bone parameters in mice fed a high fat diet. Mice were randomly assigned to six treatment groups for two months: control, high fat (HF), HF+1%mango, HF+10%mango, HF+fenofibrate (0.05mg/kg-diet), and HF+rosiglitazone (0.005mg/kg-diet). High fat diet alone, and in combination with fenofibrate or rosiglitazone, reduced whole body, tibia, and vertebral bone mineral density; whereas 1%mango counteracted the effects of a high fat diet on bone. Micro-ct data confirmed mango’s ability to improve 3-dimensional structure of bone, further demonstrating its potential in preventing bone loss due to consumption of a high fat diet alone or in combination with these medications.

**The Effects of Nutrition Education Intervention on Collegiate Athletes**

Lindsay Brown and Lenka H. Shriver

Department of Nutritional Sciences  
Oklahoma State University  
Subject Area: Environmental Sciences

The purpose of this study was to determine whether a 5-week nutrition education intervention increases nutrition knowledge and improves dietary intakes of collegiate athletes. The intervention was based on the sports nutrition manual “Keys for Performance: Sports Nutrition Series 1” developed by nationally recognized sports nutrition experts. A convenience sample of athletes from various sports was randomly assigned to an intervention and control group. Nutrition knowledge was measured using a 30-item nutrition knowledge survey at pre- and post-test. Dietary intakes, including energy, carbohydrate, protein and fat intakes were evaluated using a 3-day food record that was completed by the athletes prior to and after the 5-week nutrition education intervention. Thirty-eight athletes (mean age of 19.7±1.3 years) participated in the study. The findings indicated that nutrition knowledge of the athletes was significantly higher in the intervention group compared to the control group at the end of the study (p<0.001).

**Addiction Treatment Within the Criminal Justice System**

Teneisha Brown

McNair Scholar Program  
McNair Scholar from Texas Christian University  
Subject Area: Social Sciences

This research examines the role of addictions in criminal justice, the evolution of treatment programs and the characteristics of effective treatment facilities. Drugs have shaped the justice system since the 1950’s. Two thirds of self reporting probationers have used drugs before and more than half admitted to being under the influence of drugs during the commission of a crime. The interest in treatment for criminal justice is to prevent individuals from re-entering the system post release for drug related offenses. Attitudes toward those who have committed drug related crimes
continue to shift from a punitive focus to one of rehabilitation. The goals of programs designed for offenders change accordingly. Treatment programs have emerged as an answer to constant recidivism and reuse among those released from jail. This is a review of literature to determine what research indicates to be the attributes of the most effective treatment programs and the effect that these programs have on surrounding communities.

Personality and Attitude Toward Relationship Education: Is there a Connection?
Brandon Burr, Mylecia Nelson, Daniel Hubler, Brandt Gardner, PhD
Department of Human Development and Family Science
Oklahoma State University
Subject Area: Social Sciences

Developing satisfying intimate relationships is generally considered an important life goal for many. An estimated 90% of all adults ultimately marry and express a desire for stable and strong relationships. Yet many marriages end in divorce or experience prolonged distress, conflict, and instability. Yet overall, very few individuals experiencing psychological distress actually seek help from mental health providers. Yet issues related to marriage and family account for the primary motive for those seeking psychological services. Not much is known about the specific factors that influence an individual’s attitude toward seeking help for their relationship. Some evidence suggests the individual differences of each partner may play a role. One such proposition is that the individual personality traits of each partner impact romantic partners’ ability to function in interaction with one another, and thus, may serve as potential predictors of relationship success or distress. Personality traits also have been found to influence an individual’s support-seeking and help seeking behaviors. In addition, individual factors associated with gender have shown to be associated with positive and negative appraisals of help-seeking. In this paper, we examine personality factors that were predicted to be associated with positive and negative attitudes toward relationship education in romantic couples by gender.

Characterizing Novel Sieve Element Endomembrane Protein
Lauren Colom, James Anstead, Gary Thompson
Department of Biochemistry and Molecular Biology
Oklahoma State University
Subject Area: Biological Sciences

Phloem is the living tissue in plants responsible for nutrient transportation as well as phloem specific proteins, which aid in Arabidopsis thaliana maintenance functions. Previous studies of P-protein, or phloem protein, suggest it is constituted of several genes including ATPP1 and ATPP2. In Arabidopsis, ATPP1 has recently been identified. Phloem specific monoclonal antibodies tentatively identified a second gene, ATPP1-like, which cross reacts more strongly with specific monoclonal antibodies. In this study, our intent is to verify similar phloem specific proteins that comprise P-protein via monoclonal antibodies, while also confirming the role of ATPP1. Five monoclonal antibodies with stringy phenotypic expression were used to immunoscreen Arabidopsis cDNA libraries. Four positives were subjected to two rounds of plaque purification. Phage from the plaques were grown and induced into phagemids. Colonies were chosen and plasmid prepped for sequencing. Trihelix DNA binding protein, a transcription factor and MCCA, responsible for leucine degradation, were identified.
Evaluating the Success of the Quail Habitat Restoration Initiative (QHRI) in Oklahoma.

Andrew Crosby and Dr. R. Dwayne Elmore
Department of Natural Resource Ecology and Management
Oklahoma State University
Subject Area: Biological Sciences

In response to the population decline of Northern Bobwhites in Oklahoma, the Oklahoma Department of Wildlife Conservation (ODWC), in cooperation with the Natural Resource Conservation Service (NRCS), has undertaken a five year initiative under the Environmental Quality Incentive Program (EQIP) to provide cost-share and incentive payments for landowners to restore habitat for bobwhite on their property. The purpose of this study is to evaluate the success that program. Restoration efforts are being undertaken in 4 different regions of the state with distinctly different environments, and this presented challenges in designing the study. Some landowners can only create small, irregularly-shaped patches within a matrix of closed-canopy forest while others have very large areas of mostly open rangeland with witch to work. Because of this, three different sampling designs will be used that are tailored to the specific environment where they occur.

The Effect of Drug and Psychological Composite Scores on ASI differences among Black and White pregnant Woman who underwent Opiate Addiction Treatment

Airika Crawford
McNair Scholar Program
McNair Scholar from Wayne State University
Subject Area: Social Sciences

This research looks at the association of low vs. high drug and psychiatric ASI composite scores with other demographic, clinical, and socioeconomic factors among 19 pregnant women seeking opiate addiction treatment and screened for participation in a randomized clinical trial. It is found that within low vs. high drug composite score groups that there was a statistically significant social distribution difference but not between high and low psychiatric composite groups. The high versus low drug composite group also has significant differences in psychiatric composite and severity scores. African Americans are more highly represented in the high drug composite group than in the low. There are statistically significant differences in family/social composite scores and severity scores between both low and high drug composite as well low and high psychiatric composite scores groups. This is consistent with the literature studies in the general addiction populations showing an association between psychiatric and drug severity. The research is limited by small sample size but supports the association of family and social scores with drug and psychiatric scores in pregnant women.

Coordination of Iron and Oxygen Sensing Through Post-transcriptional Regulation of Hypoxia Inducible Factor 2-alpha

Department of Nutritional Sciences
Oklahoma State University
Subject Area: Biological Sciences

Iron Regulatory Proteins (IRPs) regulate iron metabolism by binding to Iron Responsive Elements (IREs) located in mRNAs encoding proteins of iron metabolism. The discovery of an IRE in the 5’ untranslated region of Hypoxia Inducible factor 2-alpha (HIF2α) mRNA suggests that translation of HIF2α may be iron regulated. We examined the extent to which iron deficiency alters translation of HIF2α mRNA. Weaning male Sprague-Dawley rats were fed either an iron deficient (ID, <5mg Fe/kg), or an iron adequate (50mg Fe/kg) diet for 21 days. A third group was pair-fed to receive the same amount of diet consumed by the ID
animals. Translational control was assessed by a combination of sucrose density centrifugation and real-time PCR. Our results indicate both HIF2α and L-ferritin (a known IRP target) translation were repressed in ID animals. These results provide the first whole-animal evidence that HIF2α is a target of IRP-mediated translational regulation.

**Students’ Gender, Attitudes Toward Female Professors, and Instructor Sex-Role Orientation on Perceptions of Successful Female Teachers**

**Elizabeth Davis**

McNair Scholar Program  
McNair Scholar from Harding University  
Subject Area: Social Sciences

Perceptions of successful female teachers were measured for college students from a faith-based university. Students' gender, their attitudes toward female professors, and the teachers' sex-role orientations were used as independent variables. Previous research (Bachen, McLoughlin, & Garcia 1995; Burns-Glover and Veith, 1995) showed gender as a significant factor in students' evaluations of professors. Previous studies have shown the significance of a teacher's sex-role orientation in evaluations by students (Basow, 2000; Bray & Howard, 1980; Street, Kimmel, & Kromrey, 1996). Three scenarios were given which described three different sex-typed teachers. The Attitudes Toward Female Professors Scale (Brant, 1978) was used to measure attitudes of the students. Neither gender or attitudes were statistically significant, $F(1, 145) = .780$, $p = .390$; $F(1, 145) = 1.38$, $p = .242$, respectively. Sex-role orientation of teacher (type of scenario) found significance, $F(2, 145) = 24.11$, $p < .01$. No statistical significance was found for any interaction effects.

**Integrated Finite Element Heart Mesh Models and Vectorcardiograms for Medical Utilizations**

**Drew Dawson**

Department of Chemical Engineering  
Oklahoma State University  
Subject Area: Physical Sciences & Technology

The number one cause of death of millions of American lives is cardiovascular disease. Conventional means for detecting heart disease involve measuring heart electrical activity called an Electrocardiogram. Cardiologists are still trained to interpret Electrocardiograms (ECG) by applying memorized waveforms and concepts. A veteran cardiologist can obtain a diagnosis accuracy of approximately 90% leaving the remaining 10% of the cases to health complications and death in some circumstances. A three-dimensional representation, VCG (Vectorcardiogram), is a new method of visualizing the heart’s activity and provides much more insights into how a heart is working. In order to fully understand a VCG and visualize the heart’s activity, it is necessary to be shown with a model of a heart. This investigation presents a finite element heart mesh model designed and animated to link the physical and physiological activity of the heart, which will assist the world with cardiovascular disease diagnostics.

**Study of Emotional Regulation, Social Goals, and Time Perspective as Predictors of Retirement Satisfaction for Women Retired Less than Ten Years**

**Patricia Delcambre**

Department of Educational Psychology  
Oklahoma State University  
Subject Area: Social Sciences

The purpose of this study is to determine the ability of emotional regulation, social goals and time perspective to predict retirement satisfaction for professional women retired less than ten years. Literature
seems to suggest the motivation and emotions associated with retirement for women differs from what has traditionally been described in the literature (Hollis, 1998; Price, 2002). Little research exists which examines women’s perceived well being in retirement as most research focuses on men’s retirement satisfaction and adjustment issues (Mroczek & Spiro, 2005; Nuttman-Shwartz, 2004; Talaga & Beehr, 1995). The few studies that have been completed on women’s attitudes and experiences towards retirement have sampled small groups of cohort women, primarily university teachers in other countries who have lost their positions due to downsizing at their institution (Simmons & Betschild, 2001). Their experiences do not reflect the broad spectrum of issues that face women as they make other choices about how they want to redefine themselves. Examining how emotional regulation, social goal attainment, and time perspective affect retirement satisfaction should offer perspective into how women view themselves in the next stage of their adult life. This study used an integrative review of the literature on women and retirement issues to examine emerging variables in the literature as they apply to this population. Quantitative instruments measured emotional regulation, social goals, time perspective and subjective well being among a pilot group of retired women in order to determine their views and perspectives on retirement. Analysis of variance was used to investigate how these variables can be used to generalize findings about retirement satisfaction to the population of working women.

**Assessment of radiation shielding materials for protection of space crews using CR-39 plastic nuclear track detector**

**Joel DeWitt**

Department of Physics  
Oklahoma State University  
Subject Area: Physical Sciences & Technology

A significant obstacle to long-duration human space exploration is the risk posed by prolonged exposure to space radiation. This problem hinders, for example, the establishment of a permanent base on the surface of the Moon or a human mission to Mars. In order to keep mission costs at acceptable levels while simultaneously minimizing the risk from radiation to space crew health and safety, a judicious use of optimized shielding materials will be required. The use of plastic nuclear track detectors (PNTDs) is a proven and inexpensive method of passively measuring ionizing radiation. We have undertaken a comprehensive study using CR-39 PNTDs to characterize the radiation shielding properties of a range of materials at heavy ion accelerators. The study consists of analyzing CR-39 PNTD exposed in front of and behind shielding targets of varying composition and thickness relevant to the development and testing of materials for use in space radiation shielding.

**Barriers to Physical Activity in an Undergraduate Population**

**Amanda L Divin and Weston S. Kensinger**

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Oklahoma State University  
Subject Area: Social Sciences

Physical Activity (PA) is important in all aspects of life for individuals of any age. PA may be of even more importance during the college years, as habits formed at this time may continue throughout life. Purpose: To examine the main barriers to PA in students at Oklahoma State University. Method: Data was collected from a convenience sample of 42 students via an online survey measuring expected benefits and barriers to PA. Results: The top five barriers to PA in this sample were: (1) ‘Lack of motivation,’ (2) ‘I’m too busy,’ (3) ‘I don’t have enough time,’ (4) ‘I’m too lazy,’ and (5) ‘I’m too tired.’ However, ranking of barriers did differ by gender. Conclusions: Knowing the barriers to PA in this population, health promotion specialists can now create and implement programs targeting such barriers and help OSU to become ‘the healthiest campus in America.’
CHEMOMETRIC TECHNIQUES FOR THE DIRECT DETERMINATION OF CHOLESTEROL AND OMEGA-3 / OMEGA-6 FATTY ACIDS IN SYNTHETIC MIXTURES AND HUMAN SERUM

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Subject Area: Physical Sciences & Technology

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A multiple-analyte/multiple-wavelength assay using a mature patented color reagent is introduced that is selective to the (−CH=CH−CH2) functional group common to cholesterol, and polyunsaturated fatty acids (PUFAs). The targeted lipids of interest namely cholesterol, esters of omega-6 acids (linoleic, conjugated linoleic, and arachidonic), and omega-3 acids (linolenic, EPA, and DHA) are simulated on the basis of their abundance in human serum. Absorbance measurements were made at every 2 nm over 350-650 nm wavelength range for 15 minutes total elapsed time. Non-negative direct calibration technique shows low percent errors for binary and ternary component mixtures, but increases with increasing number of components. Non-negative indirect calibration and artificial neural network show promising RMSEP values based on simulated sera. Comparison with GC-MS in serum show similar magnitudes and refining measures are underway. The multivariate approaches indicate that the assay is a potential rugged alternative for measuring cholesterol and PUFAs in human serum.

THE EFFECT OF ENERGY PATCHES ON SUBSTRATE UTILIZATION IN COLLEGE FEMALE CROSS-COUNTRY RUNNERS


Department of Health & Human Performance
Oklahoma State University

Subject Area: Education

Substrate utilization is an important factor for endurance athletes. Utilizing lipids for longer periods of time can improve performance by sparing carbohydrate during endurance activities. PURPOSE: The purpose of the study was to examine the effects of energy patches on substrate utilization during graded exercise testing. METHODS: Twelve Division I female collegiate cross country runners participated in this study. Respiratory exchange ratio (RER) was recorded during a pre-test (without patch) and then in a post-test (with patch). The post-test included a placebo patch group and an active patch group. Statistical analysis was conducted using dependent t-tests with an alpha level of 0.05. RESULTS: The results of the study indicated no significant (p>0.05) change in RER between the baseline measures and the placebo patch measures at any stage (1-5). CONCLUSION: The results indicated no increase (p>0.05) in lipid metabolism when wearing the active patch vs. wearing the placebo patch.

Old Town to New: The Other Side of Wichita

Keshia Ezerendu, Cheryl Adams, EdD and Judith Johnson, PhD

McNair Scholar Program
McNair Scholar from Wichita State University

Subject Area: Environmental Sciences

This research examines the progressive history of the Old Town district located in the center of Wichita, Kansas. Old Town is a venue that hosts retail, residential and dining places which aim to entertain the community and attract visitors. This collection of information came from news periodicals, interviews with community leaders, government documents and research by those who influenced this downtown development. This study will show how this area benefited, not only the growth of Wichita, but also the
citizens living there and what the city personally means to them. The city’s effort to preserve the architectural integrity of the buildings, while bridging the past with the present, was a theme that was present throughout the research. Although there was, and still is, debate over whether the Old Town project would be successful, many business leaders and city officials are confident that Old Town will be a vital force for the community. The presence of Old Town has the potential to bring economic prosperity with expanded business opportunities to attract new residents and to provide a thriving atmosphere that will appeal to all groups in a rapidly growing and changing Wichita.

**Sorption of Chemical Contaminants to Natural Organic Matter, Biofilm, and Sediment**

**Kari Fallert and Jason B. Belden**

**Department of Zoology**

**Oklahoma State University**

**Subject Area: Biological Sciences**

Studies evaluating fate of organic contaminants in aquatic systems focus on partitioning between water and sediment. However, aquatic environments contain various organic substrates. These materials provide habitat and a food source for benthic macroinvertebrates. Thus, it is important to understand how contaminants partition among these matrices as niche feeding groups specializing on specific substrates may experience different exposure to contaminants if differential partitioning occurs. Sorption of environmental contaminants to types of organic matter, including leaf material and material processed by amphipods, algae, and wetland sediment was examined. Propranolol and phenanthrene were studied. For propranolol, calculated K<sub>oc</sub> values (based upon hydrophobic-hydrophilic interactions) greatly underestimate experimentally derived values K<sub>oc</sub> for all substrates. Phenanthrene predicted K<sub>oc</sub> values were predictive for some substrates, yet underestimated it for others. This work suggests that neither modeling nor experimentally determined partitioning to a single substrate is adequate for understanding fate of organic contaminants in complex aquatic environments.

**A COMPARISON OF TWO PRE-SEASON MEASURES OF BODY WEIGHT, PEAK TORQUE, AND PERCENT DECLINE IN COLLEGE WRESTLERS**

**Joanna Fiddler, Doug Smith, Matt OBrien, Crishel Kline, Ryan Fiddler**

**School of Applied Health and Educational Psychology**

**Oklahoma State University**

**Subject Area: Biological Sciences**

**PURPOSE:** The purpose of this study is to determine if a difference exists between two pre-season measures of body weight (BW), peak torque (PT) and percent decline (PD) in college wrestlers.

**METHODS:** Eight Division I collegiate wrestlers participated in this study. The wrestlers BW was recorded along with PT and PD of the quadriiceps femoris at 180 °/sec using a Biodex II isokinetic machine. Subjects completed fifty maximal leg extensions. Peak torque was recorded and PD was determined. T-tests were used to determine if significant (p<0.05) changes occurred between successive annual pre-season measures. Yearly measurements were scheduled during the second week in November. **RESULTS:** Results indicated there was a significant (p>0.05) increase in PT from the first pre-season to the following pre-season with no significant (p>0.05) change in BW or PD. **CONCLUSIONS:** The results suggest off season training programs significantly increase strength in the lower extremity without compromising wrestlers’ BW.
Analysis of MAPKs in Dictyostelium

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Subject Area: Biological Sciences

The goal of my project is to determine how the two MAPKs in Dictyostelium, ERK1 and ERK2, affect the development and phenotype of the wild-type cells and G protein-mediated signaling mutants. The over-expression of ERK1 and ERK2 may be able to show whether the two MAPKs have similar functions in development. Cells over-expressing either ERK become arrested in development after cell aggregation. In order to test how ERK1 and ERK2 over-expression affects cell differentiation of Dictyostelium, the over-expressed cells will be labeled with the Green Fluorescent Protein gene and then mixed with wild-type cells to examine the spatial distribution of the ERK over-expressed cells in a chimeric organism.

The Development of Initiatives to Combat Domestic Violence: Community Programs, Specialized Courts, and Legislation

Patrice French

McNair Scholar Program
McNair Scholar from Texas Christian University

Subject Area: Humanities

The purpose of this study is to explore the development of programs and legislation created to combat domestic violence. Federal and state legislation and professional literature on specialized courts and community programs will be examined to determine the criminalization of and public initiatives created in response to domestic violence. Analysis of the literature revealed that declaration of domestic violence as a crime has created an emergence of programs for victims, batterers, and for prevention. Community and victim advocacy programs have shown to positive produce results over the past 30 years, but lack in unified community responses from the criminal justice system and courts limit its effectiveness. The creation of federal legislation has also unified the country’s efforts at alleviating this social problem. However, the lack of uniformity in treatment programs has limited its effectiveness and its ability to be generalized. The findings suggest that there is a need to develop a unified model for batterer intervention programs. There is also a need for more research on the effectiveness of domestic violence shelters and clarification in legislation created to protect domestic violence victims and offenders.

The Effects of a Citrus Diet on Bone Density

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Subject Area: Biological Sciences

Due to its rich flavanoid content, grapefruit has been reported to reduce several age-related chronic diseases including bone loss. This study examined the effectiveness of grapefruit pulp (GF) in preventing bone loss associated with age-related estrogen reduction. The ovariectomized rat was used as a model for postmenopausal bone loss. Three-month-old female Sprague-Dawley rats were randomly assigned to a control (Sham-operated) or ovariectomized (OVX) groups fed an adequate AIN-93 control diet, OVX fed 10% and 25% dried GF (OVX-GF10 & OVX-GF25) for three months. Cortical bone from isolated femurs was scanned at 16.5 micron increments at the midshaft using microcomputed tomography. Feeding 10% GF significantly increased cortical thickness (P= 0.05) and cortical diameter, total bone area, and cortical area (P=0.02) compared to OVX group, also being more beneficial than 25% GF. We conclude that moderate incorporation of grapefruit pulp into rats’ diet has a significant positive impact on reducing ovariectomy-induced bone loss.
Effect of morphological traits on spectral reflectance indices in spring wheat


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Subject Area: Biological Sciences

The spectral reflectance indices (SRI) used as indirect selection to identify high yielding lines are employed in spring wheat for the assessing of new advanced lines. The objective of the present work was to evaluate diverse SRI categorized as vegetative and water indices in diverse genotypes with contrasting morphological traits such as leaf erectness, wax content on leaves and spikes, and spike awns. The genotypes were evaluated during two growing seasons under well irrigated conditions in Northwest, Mexico. Diverse genotype comparison were made (awn vs. awnless heads, high wax content vs. low content on heads and leaves, and high leaf erectness vs. low erectness). Our results indicate that the presence or absence of awns, wax, and leaf erectness affect the canopy reflectance deriving changes in the vegetative and water indices. The vegetative and water indices determined on these contrasting genotypes affect the relationship between SRI and grain yield.

Subsurface Transport of Phosphorus in Alluvial Floodplains


Department of Biosystems and Agricultural Engineering
Oklahoma State University
Subject Area: Environmental Sciences

For phosphorus (P) transport from upland areas to surface water systems, the primary transport mechanism is typically considered to be surface runoff. The objective of this research was to determine whether subsurface transport of P can be significant along streams characterized by coarse alluvial subsoils. A tracer test was performed with a trench, which allowed the solution to directly enter the gravelly subsoil. Rhodamine WT and P were detected in some piezometers at equivalent concentrations as measured in the trench, suggesting the presence of a preferential flow pathway (PFP). Electrical resistivity equipment was used to create three-dimensional maps of the subsurface electrical properties. Since soil resistivity is dependent on particle size, the PFP was located in the resistivity data. Currently, an additional piezometer field is being installed in order to quantify the activity of the preferential flow pathways and to estimate the subsurface P load to streams.

Findings from the Veteran Home Satisfaction Study: Aging in Place, Home Modifications, and Assistive Technology

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Subject Area: Social Sciences

In the United States, a vast majority of adults over age 65 own their own homes. For these individuals, the desire to continue living in their own homes remains high. Aging-in-place describes the process of changing the physical environment within the home to meet the emerging needs of residents as they age. Home modifications and assistive technologies are essential in facilitating this process. These modifications and enhancements can greatly increase older residents’ comfort, safety, and independence, allowing them to live in their own home for as long as possible. As part of a larger research endeavor, The Veteran Home Satisfaction Study, this study examines: the occurrence of aging-in-place; the prevalence of home modifications and assistive technologies within the home; the types of modifications made and technologies
used within the home; the level of home satisfaction; and the state of biopsychosocial well-being among a sample of World War II veterans.

**Deceive, Borrow then Steal: How Elderly Homeowners Fell Victim to Predatory Practices**

Jacqueline Ivy  
McNair Scholar Program  
McNair Scholar from Indiana University Purdue University Indianapolis  
Subject Area: Social Sciences

Abstract not received

**Platelet Activation Toward Aerogel and its Potential in vivo Uses**

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Oklahoma State University  
Subject Area: Biomedical Sciences

Fabricating new materials for use within the human body, including everything from bone to artificial heart valves, is an important research field requiring materials that are compatible with the human body. If a material is placed within the cardiovascular system which initiates platelet aggregation or activation, clots may form leading to many cardiovascular diseases. The goal of this project was to test platelet biocompatibility of a novel material, termed polyurea’nanoencapsulated silica aerogel. This silica aerogel is ~300 times stronger than traditional aerogels and has an extremely low density (0.3g/cm3) making it a good choice for artificial heart valve leaflets. Here, platelet biocompatibility was tested with aggregation and a coagulation assay. We show that our novel aerogel causes no difference in platelet activation or aggregation as compared to our control samples. This research has identified a new material which could be used effectively within the cardiovascular system.

**The CYCA1;2 promotes root development in Arabidopsis via regulating B1-type CDK activity**

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Subject Area: Biological Sciences

Cell cycle progression controls the plant growth and development and effectively integrate any environmental or development cues. Cyclin-Dependent Kinases (CDK’s) and cyclins are the main players in cell cycle. In order to survive in ever changing environment, plant uses open-architecture and adds lateral organs as and when required. Mutant study of cell cycle genes can help us to understand its role in growth and development. One such mutant defective in cyclin (CycA1;2) is tardy asynchronous meiosis (tam). TAM mutant is showing decreased number of lateral root and reduced root and shoot growth. Over-expression of TAM shows increased sensitivity to auxin with increase in size of primary root and lateral root formation. B1-type CDK shows reduced expression in tam. TAM may be interacting directly or indirectly with CDKB1;1 and regulate root development including lateral root initiation. CYCA1;2 gene might be needed for lateral root development with possible integration of auxin and cytokinin.
Impact of Hofmeister Salts on Structural Dynamics of Photoactive Yellow Protein

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Oklahoma State University
Subject Area: Biological Sciences

Water is known as the lubricant of life. Without water, most proteins are not functional. Salt alters the physical and chemical properties of water. Various studies on Hofmeister series show that high concentration salts change the stability and solubility of proteins. We report the first study on the impact of Hofmeister salts on protein structural dynamics. Photoactive yellow protein (PYP), a bacterial blue light photoreceptor, is employed as a model system. Time-resolved Fourier Transform Infrared (FTIR) spectroscopy is used to probe structural dynamics of PYP triggered by blue light excitation. Our data reveal that high concentration salt solutions alter the proton transfer pathway and suppress large conformational changes, both responsible for PYP photoreceptor activation. This study opens up a new area in the field of Hofmeister series, and shed light to the effects of Hofmeister Series on protein crystallization, protein stability and solubility.

Investigating the need for acclimatization before measuring dry thermal resistance of vacuum sealed materials.

Panagiotis Kamenidis, Branson Donna, Peksoz Semra, Huantian Cao

Department of Design, Housing and Merchandising
Oklahoma State University
Subject Area: Environmental Sciences

This study had two purposes: First to determine if lab environmental conditions when storing fabric samples prior to vacuum seal affect the dry thermal resistance testing (Rct) results; and second to determine differences by the level of vacuum seal. Two types of ballistic material (Dyneema and Kevlar) were vacuum sealed at two vacuum levels (maximum vacuum and 15 IOM) and tested with a guarded hotplate once per day for 4 days. One randomized complete block experimental design was formed, for each one of the ballistic materials. The Analysis Of Variance (ANOVA) showed that there was no significant difference among the Rct measurements for different days for both Dyneema (p<0.7253) and Kevlar (p<0.5037) while the post-hoc LSD procedure revealed that there was a significant difference between the vacuum levels for the ballistic materials (for Dyneema p<0.006 and for Kevlar p<0.001).

Vibrational Fingerprints of PYP Chromophore structure during the Photocycle

Zhouyang Kang and Aihua Xie

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Subject Area: Biological Sciences

Photoactive yellow protein (PYP) is a bacterial blue light photoreceptor for negative phototaxis. The chromophore of PYP is p-coumaric acid (pCA). Photoexcitation of PYP in the receptor state (pG) leads to trans to cis chromophore photoisomerization (pR state), followed with protonation of pCA in 250 µs (pB’ state), then protein quake in 2 ms to form the putative signaling state (pB state), and finally returning to pG state in 350 ms that completes the photocycle. To understand the light sensing mechanism of PYP, time-resolved vibrational spectroscopy is unique to capture the key structural movements during PYP signaling. We report first principle study on vibrational fingerprints of pCA structures. This study is critical in order to extract structural information from vibrational spectra, including trans-cis isomerization, protonation/deprotonation, and changes of hydrogen bonding network of the pCA chromophore in the active site of PYP.
Micromechanics of Fluorinated Epoxy Carbon Fiber Composites

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Subject Area: Physical Sciences & Technology

Increased use of carbon fiber composites has caused a concern about their long-term durability since many of these applications are exposed to multi-environment degradation like moisture, temperature and UV radiation. Conventional epoxy based carbon fiber composites readily absorb moisture. However, scientists at NASA LaRC have synthesized a novel fluorinated epoxy, which has reduced moisture absorption and hence potentially increased resistance to environmental degradation. This project aims towards studying the effect of moisture absorption on fluorinated-epoxy carbon fiber composites and a comparison with their conventional counterparts. Micro-bond tests are performed on fluorinated and non-fluorinated epoxy based single fiber coupons before and after boiling water degradation. It is expected that fluorinated-epoxy based single fiber coupons will exhibit relatively reduced degradation in interfacial shear strength as compared to their non-fluorinated counterparts.

Product Development Research at General Motors

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Subject Area: Physical Sciences & Technology

During an internship at General Motors, product development research was conducted in Body Engineering/Front & Rear Closures. The main project was a competitive hood overtravel study. Overtravel is the distance a hood travels past the 'closed' position as its being shut. If the amount of overtravel is too great then the hood may come in contact with interfacing parts, such as headlamps and grilles. GM vehicles have been carefully engineered so that this doesn’t occur, but the question is whether or not they are over engineering their hoods. If GM can reduce the amount of engineering work as well as the size or number of parts (such as dampeners, struts, etc) that go into a hood’s design while still preventing damage during a hood slam, the result would be a decrease in cost as well as an overall decrease in mass, which is an effective way to improve fuel economy.

The Industrialization of Hip Hop in Mainstream Media

Porscha Kelley
McNair Scholar Program
McNair Scholar from Texas Christian University
Subject Area: Humanities

The equivocation of inner city delinquencies by local and state government has produced swelling pools of destitute and crime stricken neighborhoods. Within this environment emerged a culture that provided a means of expression for its poverty shackled captives. The hip-hip culture grew in its popularity through three forms including dance, graffiti, and rap. Hip-Hop’s introduction into the mainstream media made way for a publicized revolutionary movement of otherwise disenfranchised people. It gave voice to the entrepreneurial spirit of underrepresented youth.

However, certain conventional conceptions and stereotypical escapades coupled with industrialized propaganda have led hip-hop’s popular culture astray. Tabloid tactics in the media are used to glamorize the now overly explicit voice of hip-hop. This type of behavior in reality has made its impression on what our society views as disruptive occurrences and socially acceptable behaviors. Mediated messages in hip-hop culture have been mirrored in our society to a larger implication.
Perceived Benefits of Physical Activity within a College Population

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Subject Area: Social Sciences

Oklahoma State University (OSU) has committed itself to ‘striving to be the healthiest campus in America’. One important factor within this initiative is physical activity (PA). In accordance with the theoretical application of the Health Belief Model (HBM) one must perceive that the benefits of PA are great enough to engage in the said activity. Measuring these internal beliefs is crucial in determining which factors health educators should focus on. Method: Data was collected from a convenience sample of 42 students via an online survey measuring expected benefits and barriers to PA. Results: The top three benefits found were in our sample were: 1. Appearance, 2. To feel better, 3. For good health Conclusions: Knowing the top perceived benefits of PA health educators can now implement programs targeting such perceptions, helping OSU to become ‘the healthiest campus in America.’

The Effects of Autogenous Healing on Cracked Concrete

Eric Kim and Tyler Ley

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Subject Area: Physical Sciences & Technology

Concrete is the most abundant man-made material on Earth. Concrete plays a vital role in today’s society; however, it still has its drawbacks. One of these drawbacks is cracking in concrete. There have been documented instances in which concrete has naturally healed itself causing the cracks to either partially or completely disappear. This autogenous, self-produced, healing in concrete is considered to be a not completely understood phenomenon to construction and civil engineering professionals. Many experts acknowledge that autogenous healing does occur, however there have been few studies to investigate why it happens. There are many conflicting theories to why concrete can naturally heal itself under certain unknown circumstances. This project sets out to hopefully give some insight to these issues that have not been thoroughly addressed.

Practice Makes Perfect

Trecia Kippola and Tracy L. Morris, Ph.D.

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Subject Area: Education

Beginning in the Fall of 2004 a quiz/requiz method was administered in various statistics courses (STAT 3013, 4013, 4033, 4053, 4073) at Oklahoma State University. The students in these courses were given weekly quizzes in lieu of graded homework and a perfect score was required on each quiz. If a perfect score was not achieved on the first quiz the students were allowed to complete a similar but different retake quiz. To encourage maximum effort, students were given one bonus point for a perfect score on the first try of each quiz. A few of the objectives of the quiz/requiz method were to increase attendance, to provide feedback on the students work before exam time, to improve grades, to improve statistical/scientific writing skills, and to reduce the amount of grading. The student’s final course grades and an attitude survey were used to measure the success of the quiz/requiz method.
Exploring Risks for Consumers in Online Apparel Shopping for US College Students as compared to Korean College Students

Seung Bong Ko
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Oklahoma State University
Subject Area: Environmental Sciences

The purpose of this study is to investigate the relationship between risks and buying consideration among US and Korean young consumers within the process of purchasing apparel products through the Internet. The survey was completed 161 US college students who resided in US and 169 Korean college students in Korea. Standard multiple regression was conducted to allow for estimation of the buying consideration, which was simultaneously regressed on the set of five predictors: risks of delivery, security, and return, and perception of price and product quality. In the result of standard regression of both countries, the squared multiple correlation coefficients (SMC) were significant. Among five variables, delivery, security, and return contributed significantly to the prediction of buying consideration of US young consumers. On contrary, for Korean young consumers, the other two variables, quality and price, contributed significantly to the prediction of buying consideration of Korean young consumers.

Effective and Efficient Technology in 2008 for Pre-service Teacher Reflection

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Subject Area: Education

While the concept of pre-service teacher reflection may not be new, the technology used to capture the teaching presentations often changes as equipment become antiquated. This descriptive study considers the latest video recording equipment and it’s benefits. Two courses were used to implement the use of new digital video recording equipment. The new equipment was used to capture pre-service teacher practice lessons then transferred to the student’s USB flash drive. Results included a shortened turn-around time for viewing and reflection by the student and eliminated the need for cassette tapes. Additional benefits are the low cost for the student and the ease of digital file sharing via email and internet.

Environmental Degradation in Carbon Fibers

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Oklahoma State University
Subject Area: Physical Sciences & Technology

The fiber-matrix interface plays an important role in the strength and durability of the fiber-reinforced polymer matrix composite. For carbon fibers special oxidative or physical surface treatments are used to enhance the fiber-matrix interfacial strength. Several investigators have studied the effects of carbon fiber surface treatment on the fiber tensile strength and the fiber-matrix interfacial shear strength. Nonetheless, it is not well understood how surface treatments are affected by environmental exposure. This study focuses on the surface, chemical, and mechanical characterization of as-received, de-treated, and surface treated carbon fibers as a function of degradation using boiling water. An effort is thus made to identify fiber-surface treatments that are resistant to environmental degradation.
Methyl-1-alkyl-6-nitro-1,2,3,4-tetrahydroquinoline-2-acetates by a tandem SNAr-Michael reaction

Eric Lee and Richard A. Bunce
Department of Chemistry
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Subject Area: Physical Sciences & Technology

A synthesis of methyl (‘-1-alkyl-6-nitro-1,2,3,4-tetrahydroquinoline-2-acetates has been developed from methyl (E)-5-(2-fluoro-5-nitrophenyl)-2-pentenoate using a tandem reaction sequence. The reaction generally proceeds in 60-95% yields in N,N-dimethylformamide (DMF) or dimethylsulfoxide (DMSO) using unhindered primary amines. A disadvantage of using DMF, the usual solvent for these reactions, is its tendency to undergo exchange with the amine in the reaction, which leads to an impurity that is difficult to separate from the desired product. Reaction optimization studies indicated that DMSO is a better solvent for this transformation and gives the products in higher yields without this impurity. Results with hindered amines suggest that SNAr addition to the aromatic ring reaction initiates the sequence when the side chain incorporates an unsaturated ester while Michael addition to the side chain initiates the sequence when it incorporates an unsaturated ketone. This result confirms the relative Michael reactivity of unsaturated esters and ketones.

Three-Dimensional Motion of Polymer Jets during Electrospinning of Nanofibers

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Subject Area: Physical Sciences & Technology

The generation of polymer nanofibers has wide applications in textile and tissue engineering, among others. The three dimensional motion of electrospun polymer jets have strong impact on the quality of the generated nanofibers. In this study the three dimensional motion of these jets were experimentally investigated using double view digital microscopic holography. Nd:YAG laser was used as the light source to record two holograms on two orthogonal CCD sensors. The present optical setup was successful in reducing the uncertainty in the spatial measurements. The results show the spatial growth of both Rayleigh and bending instabilities of the polymer jet in the near-injector region.

Maternal Nutrient Intake and Parenting Stress Levels

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Subject Area: Social Sciences

Dietary intakes of nutrients are associated with psychological stress. This study is a preliminary investigation of maternal dietary intake related to levels of parenting stress in the nursing mothers of three month old infants. Nutrient status was assessed by the Dietary History Questionnaire (DHQ) and stress was measured by the Parental Stress Index. Data was gathered for 17 women with a mean age of 30.6 years. All but one woman took a multivitamin and mineral supplement. Means and standard deviations of the DHQ are presented and compared to Dietary Reference Intakes. Relationships between dietary components and parenting stress were explored.
Supplementation with Mango Reduced Glucose and Lipid Levels in Mice Fed High Fat Diet

Wenjia Li, Sandra Peterson, Angela Brown, Penny Perkins-Veazie, Brenda Smith, Stephen Clarke, Edralin Luca

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Subject Area: Environmental Sciences

Mango is a tropical fruit that contains bioactive compounds that may prevent or reduce risk factors of cardiovascular disease (CVD). This study compared the effect of mango to that of hypocholesterolemic drug (fenofibrate) and hypoglycemic drug (rosiglitazone) on clinical parameters of mice fed high fat diet (HF). Male C57BL6 mice were randomly divided into six treatment groups: control, HF, HF + fenofibrate (0.05mg/kg diet), HF + rosiglitazone (0.005mg/kg), HF + 1% mango and HF + 10% mango. Consumption of 1% mango significantly reduced the weights of adipose tissue and fat mass compared to those in HF group. Glucose tolerance test was also improved by 1% mango. Overall, supplementation with 1% mango for 8 weeks was better than the 10% mango, rosiglitazone and fenofibrate in modulating glucose and lipid levels due to high fat diet. Our findings suggest that incorporation of mango in the diet may lower risk factors for CVD.

On the Rate and Mechanism of internal proton transfer reaction in protein

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Subject Area: Biological Sciences

Proton transfer reactions are crucial in a large array of biomolecular processes, encompassing bioenergetics, biological signaling, and enzymatic catalysis. Understanding the mechanism of proton transfer is a long standing problem in biophysics. We report a proof of concept study on the rate and mechanism of internal proton transfer reactions in proteins. A proton transfer model system, that resembles the active site structure of green fluorescence proteins and photoactive yellow proteins, is employed in this study. A first principle method without adjustable parameters was used to construct the energy landscape for proton transfer. We identified two key structural elements that control the rate of proton transfer. This mechanism is expected to be applicable to a broad range of proton transfer systems.

Alterations in VDR Expression with Chronic Inflammation

Yin foong Lim, Y. Wang, E. Rendina, W. Jiang, S.L. Clarke, E. A. Lucas, B.J. Smith

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Subject Area: Biological Sciences

Inflammatory conditions are often associated with compromised serum 25-hydroxy vitamin D status and previous in vitro studies have shown that inflammatory cytokines may be involved. The purpose of this study was to examine the effects of low dose LPS administration in vivo on inflammatory pathways and VDR gene expression. Twelve-week-old male C57BL/6 mice (n=30) were administered (i.p.) LPS (0, 0.1, 0.2 mg/kg bw/d) for 14 days. Body weight was not altered throughout the study. RT-PCR indicated significant up-regulation of hepatic IL-10, CD14, TLR4, and TGF-b with increasing dose of LPS. Splenic CD14, TLR4, and IL-10 were not significantly altered after 14 days, but VDR expression tended (p=0.08) to be decreased with the higher LPS dose. Our data suggest that chronic low dose LPS has modest effects on VDR expression, and further studies should explore the effects of LPS on hydroxylase enzymes involved in vitamin D metabolism.
The Effects of Financial Education on Financial Literacy Levels
Andrieka Lockett
McNair Scholar Program
McNair Scholar from Texas Christian University
Subject Area: Social Sciences

Low income populations as well as other vulnerable populations are often in need of financial assistance and it is also these populations who lack important financial knowledge necessary to make appropriate financial decisions. However, continual financial assistance from social service agencies and other organizations will not help these populations to be self-sufficient or knowledgeable about financial matters without education. Financial education is used as a method to equip people with necessary skills and knowledge that can be used as a way to improve their financial situation. This study discusses the curriculum of a financial education class provided by a financial assistance program and the level of financial knowledge of those who participated in the class prior to entering the class and after completion of the class.

Ethnicity: A key factor in Depression among college women?
Antoinette London, Layal Abadi, Angela Fish, Sophia Kazulkina, Sarah Lietzow, Rita J. Casey
McNair Scholar Program
McNair Scholar from Wayne State University
Subject Area: Humanities

Depression symptoms were measured in three groups of female college students attending a large urban university. Each individual was recruited from one of three different ethnic groups, African American, Arab American, or White. Percentage of participants high in depression symptoms within each group were compared, and also contrasted with the usual percentage of depression observed within the general U.S. population of adult women. Most surprising was the very high degree of depressive symptoms among the Arab American students (52%) in contrast to what is usually found (about 10%) within the general population of adult women. African American students also had more depression than white students, though significantly less than the Arab American students. Explanations of results are offered in terms of degree of cultural support and age. Limitations of the design are discussed, as well as suggestions for future research.

The effect of the extract of Rubaiyat, a native Oklahoma grape, and resveratrol in inhibiting breast cancer cell proliferation
Emily Luebcke, Sandy Peterson, Stephen Clarke, Brenda J Smith, Gilbert John, Arpita Basu, Edralin A Lucas
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Subject Area: Environmental Sciences

Breast cancer is one of the most common malignancies among women in North America. Recent data show that some dietary antioxidants may have potential benefits in cancer therapy. Studies show that resveratrol is structurally similar to estrogen and is therefore implicated for use as an anticancer and therapeutic agent in breast cancer. This study compared the effects of the extract of the Rubaiyat grape to that of resveratrol in inhibiting human breast cancer MCF-7 cell proliferation and inducing apoptosis. Rubaiyat extract used in the study contains 833 ‘g/mL total polyphenol, 38 mg/L flavonoid, and 116 mg/L anthocyanin. The 3-4,5-Dimethylthiazol-2-yl-2,5-diphenyltetrazolium bromide and sulphorhodamine B proliferation and viability assays indicate that high total polyphenol concentration of the Rubaiyat extract is necessary to inhibit cell proliferation in MCF-7 cells.
Customer Satisfaction and Revisit Intention: The Case of a Chinese Buffet Restaurant

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Subject Area: Social Sciences

This study identified the factors influencing customers' dining satisfaction and revisit intention in the context of the Chinese Buffett restaurant in the US. It also tested ethnic groups' influences on those relationships.

Evaluation of Biomass Yields of ‘Kanlow’ Switchgrass in Winter Months

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Subject Area: Biological Sciences

Switchgrass (Panicum virgatum L.) can be cultivated and managed as renewable feedstock for biofuels production to reduce our over-dependence on fossil fuels. To produce maximum biomass yields in switchgrass, one harvest by mid-September is recommended. However, a wider harvest window is needed to process large areas to supply feedstocks for a large-scale industrial biorefinery. The objective of the study was to measure switchgrass biomass yields in winter months from November through the following March. The experimental design was a randomized complete block with six replications. The results showed reduced yield averaged over winter months. Among the winter months, the highest yield was 4.95 ton/ha in November, 2007, while the lowest 2.918 t/ha in March, 2008. The biomass yields harvested in November and December were significantly higher among the winter months.

Modulation of DBC2 Function by the Molecular Chaperone Hsp90

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Subject Area: Biomedical Sciences

Deleted in Breast Cancer 2 (DBC2) is a tumor suppressor gene that was identified to be present in a common chromosomal region that was deleted in a screen of breast cancer samples. DBC2 is a member of the atypical RhoBTB subfamily. It contains an N-terminal Rho-like GTPase domain, followed by a tandem pair of BTB (broad complex/bric-a-brac/poxvirus/zinc finger) domains and a putative RING domain. DBC2 has been demonstrated to interact with and be ubiquitinated by Cullin 3 and reported to lack GTP binding activity. Our data indicates that DBC2 interacts with the molecular chaperone Hsp90, primarily through its Rho domain, and retains the capability to bind GTP. GTP binding shows hallmarks of being an Hsp90 dependent process as it is inhibited by the Hsp90-specific inhibitor geldanamycin. Our studies indicate that Hsp90 modulates DBC2 activity and is involved in the mechanism of regulation of DBC2’s tumor suppressor function.
Electrical Penetration Graph Comparisons of Squash Bug (*Anasa tristis*, Hemiptera: Coreidae) Feeding on Watermelon and its Relatives

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Subject Area: Biological Sciences

Electrical penetration graph (EPG) technique is a useful tool for studying the feeding behavior of piercing and sucking insects. The squash bug is a serious pest of watermelon in United States and is the vector of Cucurbit yellow vine disease (CYVD). Stylet penetration behavior of the squash bug on watermelon (*Citrullus lanatus*), var. “Royal Sweet” and four of its relatives was recorded for twenty hours using EPG. All EPG waveforms were analyzed and duration and time to initiation of different probes were measured. Squash bugs made the longest probes in Royal Sweet and the shortest probes in *Citrullus colocynthis*. EPG parameters of squash bugs given access to *C. colocynthis* lines and *P. fistulosus*, such as short duration probes, taking longer to reach to the vascular tissues, and reducing the duration of vascular feeding, may be an indication of the presence of squash bug resistance factors.

Narrow Casting or Narrowly Casting: A Qualitative Analysis of Marketing Strategies & Advertisements Used on the Popular Social Networking Website Facebook

Monica Mason

McNair Scholar Program
McNair Scholar from Southern Illinois University Carbondale
Subject Area: Social Sciences

Historically, marketing strategies and advertisements have perpetuated stereotypical and unrealistic representations of gender in the way they are presented in various forms of mass media. The Internet provides the means to challenge and reconstruct such media representation. The purpose of this research is to examine how men and women are being targeted on the popular social networking website Facebook. This site allows marketers and advertisers to narrow cast or personalize ads to both males and females based on the information provided on their profile pages. By monitoring the pages of individual users and conducting a qualitative analysis of the data collected, I will be able to investigate whether Facebook implements marketing strategies that target individuals based on their profiles, or if it uses generic marketing practices that continue to perpetuate stereotypical gender roles.

Stay positive: A conceptualization of psychological capital in third party mediators

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Subject Area: Social Sciences

An emerging trend is occurring in workplace justice systems as conflict resolution strategies are shifting from traditional litigation to a more private form of mediation. The benefits of mediation are numerous including neutrality, voluntary participation, confidentiality, ease of use, cost savings and high success rate (Moore, 2003). Though mediation is growing in popularity, little research has been done that examines psychological characteristics of the mediator who may influence the outcomes of the mediation session. Positive Organizational Behavior (POB) research has started to explore how the characteristics of hope, optimism, resilience and self-efficacy (PsyCap) are hedging against negative behaviors in the workplace (Avey, Hughes, Norman, Luthans, 2007). This conceptual piece proposes that the four variables of PsyCap, separately and collectively will have differing affects on the mediator and in turn the mediation outcomes.
MicroRNA analysis in Switchgrass

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Subject Area: Biological Sciences

MicroRNAs (miRNAs) are ~22 nt long non-coding RNA molecules found only recently in animals and plants. miRNAs have emerged as critical regulators of gene expression at the post-transcriptional level. In plants, miRNAs have been shown to play important roles in plant development and in response to abiotic and biotic stresses. Within the plant kingdom, most of the work focused with microRNAs and their targets has been done in Arabidopsis thaliana and rice. Thus far, at least ~20 miRNA families are found to be conserved between Arabidopsis and rice. The miRNA component of switchgrass is unknown. Using the rice-specific probes, we present the evidence that some of the conserved miRNAs are expressed in switchgrass. The expression pattern of several miRNAs, is highly varied between different tissues in switchgrass. Using complementarily between miRNAs and mRNA, we predicted targets for some of the conserved miRNAs in switchgrass.


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Subject Area: Social Sciences

The mass media is probably the most powerful conveyor of socio-cultural ideals and is therefore argued to play an important role in the development of body dissatisfaction and eating pathology (Andersen & DiDomenico, 1992; Nemeroff, Stein, Diehl, & Smilack, 1994). Dittmar (2005) suggests that it is not necessarily socio-cultural pressures that are detrimental long-term to individuals’ body image, but the extent one internalizes these beliefs, values, or ideals related to their own appearance. Researchers propose women engage in a process of social comparison when exposed to thin ideal images and are then less satisfied with their own physical appearance (Posavac, Posavac, & Posavac, 1998; Heinberg & Thompson; Richins, 1991). The aim of the current study is to analyze the extent women socially compare themselves with the ‘ideal’ thin images portrayed in the music videos and the effect this has on one’s own body image and self-esteem.

Polymorphism in Microsatellite Loci in Impatiens capensis (Balsaminaceae)

Lydia Meador and Dr. Janette Steets

Department of Botany
Oklahoma State University
Subject Area: Biological Sciences

Impatiens capensis is a cleistogamous herb that exhibits an obligate mixed-mating system producing both showy, outcrossing chasmogamous flowers and inconspicuous, selfing cleistogamous flowers. Although isozymes have been used to assess mating patterns in I. capensis populations, these markers are limited in the number of loci. Microsatellite markers are hypervariable, allowing for more in-depth genetic studies of I. capensis. Several microsatellite markers have been developed for Impatiens species; however, none have been amplified in I. capensis. In this study, two microsatellite markers (Ila67 and Ila228) developed for congeneric Impatiens species were tested for amplification and polymorphism in I. capensis. DNA was extracted from eight I. capensis herbarium specimens collected throughout eastern Oklahoma, Both Ila67 and Ila228 amplified for all individuals tested. Individuals were polymorphic for Ila67, with three alleles identified. Individuals were monomorphic for one Ila228 allele. As Ila67 was polymorphic, this microsatellite marker may be useful for future studies of I. capensis mating patterns and population genetics.
Dynamics of $H^+ + CO_2$ at $E_{Lab} = 30$ eV

Mayra Miranda, Patrick McLaurin, Dr. Jorge A. Morales
McNair Scholar Program
McNair Scholar from Texas Tech University
Subject Area: Physical Sciences and Technology

Preliminary results of a complete study of the $H^+ + CO_2$ reaction at $E_{Lab} = 30$ eV with the electron nuclear dynamics (END) theory is herein presented. The employed level of the END theory prescribes classical mechanics for the nuclei and a single-determinantal representation for the electrons. Present simulations correspond to collisions having the initial CO$_2$ target placed orthogonal to the incoming H$^+$ projectile. The effect of using different atomic basis sets is also considered. Present results show that the main processes occurring in this system are non-charge-transfer (NCTS) and charge-transfer scattering (CTS). Some level of collisional-induced vibration in CO$_2$ is also predicted at low impact parameters. However, the present system shows a low level of reactivity, which is somewhat insensitive to the employed basis sets. Analysis of the H$^+$ scattering in terms of deflection functions is also included.

Some Selected Micro-nutrient Status in Ethiopia: Implications for Sustainable Productivity

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Subject Area: Physical Sciences & Technology

Based on the results of Ethiopian soil fertility study in the early 1960’s, soil micro-nutrients were found to be adequate. However, as cultivation continued, it is suspected that nutrient mining by crops and lack of replenishment could result in frequent and widespread deficiency. Stratified sampling method was used to collect soil and forage samples to assess the status of soil micronutrients. Results were compared with critical values. Iron and manganese were found to be sufficient for the different soils and crops. But, up to 78% of the soil samples showed zinc and copper deficiency. Similarly, zinc and copper deficiencies were widespread and very high extending up to 87% for the different crop samples. Unlike the previous study, this result revealed wide spread zinc and copper deficiency. Therefore, it is worthwhile to make further study on the application of these nutrients for sustainable crop production, human health and economic benefits.

Substituted 2,3-dihydro-4(1H)-quinolinones by a tandem Michael-SNAr reaction

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Subject Area: Physical Sciences & Technology

A tandem Michael-SNAr reaction has been developed for the efficient synthesis of substituted 2,3-dihydro-4(1H)-quinolinones. Success in the reaction follows the expected steric and electronic effects for the reactions involved and suggests that the Michael reaction initiates the sequence. Treatment of doubly activated 1-(2-fluoro-5-nitrophenyl)-2-propen-1-one (two activating groups on the aromatic ring) with primary amines in N,N-dimethylformamide provides 2,3-dihydro-4(1H)-quinolinones in 67-78% yields. Singly activated systems proceed similarly, but fail to undergo the final ring closure with hindered or aromatic amines. Compounds with one activating and one deactivating group give only simple 1,4-addition products with no ring closure. The desired heterocycles are formed cleanly when the beta carbon of the side chain Michael acceptor is unsubstituted or monosubstituted so that the Michael reaction occurs first. If this carbon is disubstituted, uncyclized products resulting from an initial SNAr reaction are observed.
Burdensomeness as a Mediator between Social Support and Suicide and Between Stress and Suicide

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Subject Area: Social Sciences

Suicide claimed the lives of 32,439 Americans in 2004 and was therefore the eleventh leading cause of death in the United States at the time (American Association of Suicidology, Jan 2, 2007). Furthermore, suicidal ideation has been linked to levels of subjective stress and levels of perceived social support. Using a piece of Joiner’s (2005) Interpersonal Psychological Theory of Suicide, the current study sought to examine the degree to which perceived burdensomeness mediates the link between perceived social support and suicide and the degree to which perceived burdensomeness mediates the role between subjective stress and suicide. The current study sampled 214 undergraduates. After the completion of the questionnaire, the following hypotheses were proposed: 1) perceived burdensomeness will fully mediate the link between perceived social support and suicide and 2) perceived burdensomeness will fully mediate the relationship between perceived stress and suicide.

Influence of solvent extraction on antioxidant activity of Cynthiana grape pomace using Oxygen Radical Absorbance Capacity (ORAC) assay.

Ioannis P. Oikonomakos, William G. McGlynn, Christina A. Mireles DeWitt and Akhila Vasan
Department of Food Science
Oklahoma State University
Subject Area: Biological Sciences

With increasing interest in dietary antioxidants, researchers have investigated using horticultural processing industry waste streams as feedstocks for obtaining these valuable by-products. Our study focused on developing a rapid and scalable method for screening winery waste streams for antioxidant activity using four solvents: petroleum ether, 70% methanol, 50% acetone, and 0.01% pectinase in water. Two solvent:pomace ratios and four extraction times were used. Antioxidant activity was quantified using the Oxygen Radical Absorbance Capacity (ORAC) assay. Higher activity was observed in the Acetone and Methanol extracts, with average of 32 and 21 μmoles Trolox equivalents/g pomace respectively. Acetone extracts showed significantly higher activity than methanol extracts in all treatments. Petroleum ether and pectinase/water extracts had at least 4 times lower activity. Our screening method allowed us to identify potentially high-value grape processing waste products, thus paving the way toward developing a commercially-viable method for extracting antioxidants from grape pomace.

Effect of glucose on the growth rate of P11 during fermentation.

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Department of Biosystems and Agricultural Engineering
Oklahoma State University
Subject Area: Biological Sciences

The increasing demand for fossil fuels has ultimately led to an increased interest in alternative renewable fuels such as ethanol. Synthesis gas (primarily CO, CO₂ and H₂) produced from switch grass can be used to produce ethanol and acetic acid, when the organism P11, is used as a microbial catalyst. One problem with the use of this organism is that it has a slow growth rate with syngas, as its substrate. This study investigates the increase in growth rate of P11 using glucose as the initial substrate, and then switching the substrate to syngas, after they have consumed most of the glucose. The study shows that the addition of glucose reduces the lag phase and also increases cell growth and concentration.
Houseflies as potential carriers of E. coli O157:H7

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Oklahoma State University
Subject Area: Biological Sciences

E. coli O157:H7 has the potential to cause death in humans. It is common in livestock. The purpose of this study is to develop a screening method to determine if the flies that coexist with our livestock also carry this strain. Flies were captured from cattle facilities and pastures. DNA was extracted from sixteen randomly selected flies. A PCR assay was developed for eae gene that is specific for enterohemorrhagic strains of E coli. Fly DNA was tested for the presence of this eae gene. There were no positive results in preliminary screening. This could be because there are too few of this particular bacterium in an average fly to detect; making it easily overwhelmed by the large amounts of DNA from other organisms. If this is the case, the protocol could yield false negatives. Further analyses are performed to validate our data.

Anti-inflammatory Properties of Oklahoma Grapes

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Department of Nutritional Sciences
Oklahoma State University
Subject Area: Biological Sciences

Cardiovascular disease (CVD) is the leading cause of death in the US and Oklahoma. Inflammation has been implicated in the pathogenesis of atherosclerosis, the common underlying cause of CVD. Dietary changes to reduce inflammation can help prevent CVD. The purpose of this study is to assess the phenolic content of Oklahoma grapes and determine their anti-inflammatory properties using RAW 264.7 macrophages. Thirty-two varieties of grapes from the OSU Cimmaron Valley Research Station were screened for total phenolics, anthocyanins, and flavonoids content using colorimetric assays. The variety Petit Verdot had the highest total phenolics concentration (79.5μg/ml) while Sauvignon Blanc had the lowest concentration of 18.6 μg/ml. Extract of ten grape varieties (five high and five low total phenolic content) were used to assess anti-inflammatory properties in RAW 264.7 stimulated with lipopolysaccharide. Cells treated with Sauvignon Blanc extract produced the least amount of nitric oxide indicating attenuation of inflammation.

Momordica charantia improves body weight, clinical parameters, and glucose tolerance in mice fed high fat diet

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Subject Area: Biomedical Sciences

Obesity, hypercholesterolemia, and hyperglycemia are major health concerns in the US and worldwide. Momordica charantia (MC), bitter melon, has been reported to have hypoglycemic properties. This study compared the effects of freeze-dried MC with a hypoglycemic drug, rosiglitazone, and hypolipidemic drug, fenofibrate, on body weight and clinical parameters in high fat (HF)-fed C57BL/6 mice. Mice were randomized to seven treatment groups: control (ad lib), control (pair fed), HF, HF + 1% MC, HF + 10% MC, HF + rosiglitazone, and HF + fenofibrate for 16 wks. Final body weights of HF+10% MC group were similar to the HF+ rosiglitazone group. Dietary supplementation with 10% MC prevented the increase in adiposity and normalized clinical parameters due to high fat diet.
Comparison of Bulk and Nanoscale Properties of Polymer Precursor Derived Silicon Carbide with Sintered Silicon Carbide

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Subject Area: Physical Sciences & Technology

Polymer precursor derived silicon carbide ceramics made by polymer infiltration and pyrolysis (PIP) technique offer various advantages over conventional processing, such as near net shape fabrication, relatively low temperature processing and the ability to tailor the microstructure. In this work, a comparison has been conducted between properties of polymer precursor derived silicon carbide and commercially available sintered silicon carbide. Silicon carbide samples are fabricated by pyrolysis of allylhydridopolycarbosilane at different temperatures. Average grain size is determined using XRD. Nanoscale mechanical properties in terms of modulus and hardness and bulk scale characterization in terms of flexure strength have been measured. Nanoscale as well as bulk properties of commercially available silicon carbide were higher than PIP derived SiC, however, for the latter some improvement in properties is observed with increasing processing temperature.

The Burden of Perfectionism in Suicidality

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Subject Area: Social Sciences

Perfectionism can be a positive attribute that motivates an individual to high levels of achievement. However, perfectionism can also be maladaptive for the individual who interprets any performance less than perfect as a failure. Past research has shown that maladaptive perfectionists often feel that they cannot live up to their own expectations, and the discrepancy they perceive between their goals and their expectations can lead to various forms of psychological distress, including suicidal ideation and suicide attempts. The construct of perceived burdensomeness, wherein one feels that one’s ineffectiveness has created a burden on others has also been linked to suicidal behavior. It was hypothesized that the resulting feelings of ineffectiveness and burdensomeness perfectionists experience when they fail to meet their goals that can lead perfectionists to consider suicide. Results indicated that perceived burdensomeness fully mediated the relationship between perfectionism and suicidal ideation.

Differences in Suicide Risk Based on Ethnicity

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Department of Psychology
Oklahoma State University
Subject Area: Social Sciences

African Americans have evidenced lower rates of suicide relative to the general population despite being exposed to higher levels of risk factors. This paradox has been proposed to be a result of protective factors such as religiosity and higher levels of familial involvement. The purpose of this study is to further investigate protective and risk factors of suicide in a sample of African Americans and a sample predominantly comprised of Caucasians. The constructs of the interpersonal-psychological theory of suicide, hope theory, and religiosity were used. It was hypothesized that African Americans would have higher levels of protective factors and risk factors relative to the Caucasians. Results were partially consistent with this hypothesis.
Dietary Supplementation with Dried Plum Prevents Ovariectomy-Induced Bone Loss in C57BL/6 Mice and Modulates the Immune Response

Elizabeth Rendina, YF Lim, D Marlow, Y Wang, SL Clarke, S Kuvibidila, EA Lucas, BJ Smith

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Oklahoma State University
Subject Area: Biological Sciences

Due to recent evidence demonstrating the link between the immune system and skeletal health, this study was designed to determine the effects of dried plum (DP) on bone metabolism and immune response. Twelve-week old female mice (n=59) were assigned to 5 treatment groups for 4 weeks: sham-operated control diet, ovariectomized (OVX) control diet and OVX receiving diet with 5%, 15%, or 25% DP (w/w). Spine bone mineral density and content were decreased (8%) by OVX, which was prevented by 25% DP. \( \mu \)CT revealed the OVX compromise in spine and proximal tibia bone volume was prevented by higher doses of DP. Alterations in bone coincided with increased serum IGF-I and reduced bone turnover in OVX mice consuming DP. Following ex vivo Con A stimulation, splenocyte TNF-\( \alpha \) production was suppressed by DP. This study supports DP’s positive effects on bone, and provides the first insight of DP’s effects on immune response.

UNDIVIDED ATTENTION? AN ATTENTION-BASED VIEW OF ORGANIZATIONAL EXPLORATION AND EXPLOITATION

Jason Ridge

Department of Business Management
Oklahoma State University
Subject Area: Social Sciences

I extend our understanding of the influence of top management team structures on the attentional focus of organizational executives. I argue that through focusing executive attention in the form of the structure of the top management team (TMT), product exploration and exploitation are influenced. Our findings provide support for these hypotheses, suggesting that a greater amount of responsibilities given to an organization’s chief executive officer (CEO) detracts the attention of the CEO and negatively affects product exploitation. In addition, the employment of a chief operating officer (COO) redirects CEO attention influencing exploration and exploitation. Finally, TMT size was found to be a structural characteristic related to organizational exploration and exploitation. My results in this study help expand the influence of the attention-based view to the organizational learning literature.

Testing the reliability of fluvial successions as a recorder of periods of dune activity

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Subject Area: Physical Sciences & Technology

Droughts have severe impacts on the economy and ecology of the central United States. Many attempts have been made to reconstruct drought frequency by using tree-rings, playas, lake deposits, and eolian dune activity. Thus far, eolian activity is the only method that provides an extensive record of drought frequency throughout the entire Holocene. One limitation of using eolian activity is the potential of older dunes being reworked by later dune activity. In this study we test the reliability of fluvial successions in recording periods of dune activity by investigating a record of fluvial aggradation events in a small creek near the Little Sahara Sand Dunes of Waynoka, Oklahoma. Changes in grain size and magnetic susceptibility were measured within a vertical section of fluvial overbank deposits created by a stream adjacent to a relict dune
field. These overbank deposits were dated using Optical Stimulated Luminescence to ages between 150-
2,400 years ago. These ages of fluvial aggradation match regional records of eolian activity.

**Effects of Disturbance on Antelopehorn Milkweed (Asclepias viridis)**

**Wyatt Sharber and Kristen Baum**

**Department of Zoology**
**Oklahoma State University**
**Subject Area: Biological Sciences**

Milkweeds participate in a unique relationship with monarch butterflies (*Danaus plexippus*) by serving as both a nectar source for adult butterflies and a host plant for larvae. Monarchs in the Great Plains overwinter in Mexico and migrate northward in the spring. This study evaluated the effects of prescribed fire on *Asclepias viridis* (antelopehorn milkweed), and the resulting implications for *D. plexippus*. A suite of characters, including plant health, nectar volume and concentration, and other herbivorous insects present, were recorded after prescribed burns in the summer. Initial results indicate summer burns provide a surge in *A. viridis* growth that is absent in unburned plots, where all plants have already gone to seed and senesced. Monarchs lay eggs on the antelopehorn milkweed in these summer burned plots in September, allowing adequate time for the eggs to hatch, pupate, and then also migrate south to Mexico.

**Protein Structure of Paramecium Bursaria Chlorella Virus-1 ATPase A392R**

**Emily Sharpe and Danny Maples**

**Department of Biochemistry and Molecular Biology**
**Oklahoma State University**
**Subject Area: Biological Sciences**

The goal of our project is to find the structure of proteins involved in the special vertex to have further support for the divergence theory. The divergence theory states although there are differences in viral genome sequences and host preferences, structural integrity is maintained. We also want to find more evidence to support our proposed viral lineage, which is the double barrel trimer. The first objective is to find the structure of the ATPases A392R, involved in the special vertex of PBCV-1. ATPases supply energy to the special vertex, and the special vertex packages DNA and gets it into the host cell. Although the major capsid protein has already been solved, we are interested in exploring other structural components to support the divergence theory, such as the special vertex. Confirmation of this structure from PBCV-1 and other viruses would lend support to viral lineage.

**Enhancing Clarity of Sign Language in a Child Living with Down Syndrome**

**Bailey Slough**

**Department of Human Development and Family Science**
**Oklahoma State University**
**Subject Area: Education**

The purpose of this study is to enhance clarity of sign language in a child living with Down syndrome, measure her progress, and assess how well her teachers understand her in order to make sure that the intervention has been effective. At the beginning of the study, clarity of sign was evaluated through photographs of the child’s signs. Teachers were asked to rate sign clarity on a Likert-type scale. The preliminary data will be presented. The ongoing intervention consists of correcting her sign through gently molding the child’s fingers into the correct shape. Finger games are also being used to increase finger flexibility and fine motor skills. Pre-intervention data and ongoing results will be presented.
Solving the FNIII Structure of Midline-1
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Oklahoma State University
Subject Area: Biological Sciences

The mutations of the Midline-1 protein (MID1) lead to birth defects referred to as Opitz syndrome. By studying the structure of MID1 using NMR spectroscopy, specific functions can be proposed for different sections of the protein leading to deeper and more detailed understanding of the mutations. Studying the structure of the complete MID1 protein has been elusive because it precipitates out of solution before NMR data is taken. However, sections of the protein that may be more stable can be studied. One of these sections is the Fibronectin type III (FNIII) domain. The research effort in the lab has been on purifying FNIII so that we could solve its structure by NMR spectroscopy. Once the structure is known, we can learn about its function by comparing the structure with other FNIII domains, and rationalizing how mutations affect the structure. This poster shows my approach to purifying a human protein in bacteria.

Sorption and Kinetics of Ammonium-Nitrogen by Naturally Occurring Zeolite Minerals
Savannah Smith, Chad J. Penn, Jason G. Warren
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Oklahoma State University
Subject Area: Environmental Sciences

Excess nitrogen (N) in the environment can contribute to both air and water quality problems; a significant source of the N is animal waste such as swine effluent. The ability of zeolites to sorb ammonium-N makes it useful as an N management tool at various points in the animal-agriculture system. However, zeolites vary in their ability to sorb ammonium-N under different solution environments, and little is known about the kinetics of this cation exchange reaction. The objectives of this study were to (i) quantify the ability of several naturally occurring zeolite minerals to sorb ammonium-N from inorganic solutions and from swine effluent, and (ii) quantify the kinetics of this cation exchange reaction by both batch and flow-through techniques. Results of cation exchange and kinetics experiments will be compared in addition to differences between inorganic solutions and swine effluent.

Does gender really matter to service providers for their developing WOM strategy?
Bongran Jin Sun
Department of Hotel and Restaurant Administration
Oklahoma State University
Subject Area: Environmental Sciences

Recently, the importance of the word of mouth (WOM) effect has been increasingly paid attention by practitioners and scholars. The purpose of this study is to examine the differential role of gender on the relationship between the service quality and WOM. By using gender as moderator influencing relationship service quality and WOM, this study provides another insight of market strategy regarding to determinant of WOM. A sample of travelers in Midwestern city serves as the study setting. The expected result is that total effect of relational quality on the WOM is stronger for female customer, while core service quality exerts a stronger total influence on WOM for male customers.
Butyrate Enhances Disease Resistance of Chickens by Inducing Antimicrobial Host Defense Peptide Gene Expression

Lakshmi Sunkara, Nicole B. Fry, Ruoye Yang, Yugendar R. Bommineni, Mallika Achanta, and Guolong Zhang

Department of Animal Science
Oklahoma State University
Subject Area: Biological Sciences

Host defense peptides (HDPs) constitute a broad-spectrum antimicrobials with pleiotropic effects on the immunity. Modulation of endogenous HDP synthesis may lead to an enhancement in innate immunity and disease resistance. In this study, we hypothesized that exogenous administration of butyrate, a short-chain fatty acid, is capable of augmenting HDP gene expression and reducing bacterial colonization in chickens. We have found that butyrate is a potent inducer of chicken HDPs both in vitro and in vivo. The lysates of butyrate-treated chicken monocytes also showed an increased killing of Salmonella enteritidis. Furthermore, we observed a 10-fold reduction in bacterial titer in the ceca and spleens of S. enteritidis-infected chickens. Collectively, our results indicated that butyrate supplementation has potential for further development as a cost-effective strategy for the control of infectious diseases and preharvest food safety with no reliance on antibiotics, which causes a rapid dissemination of antibiotic-resistant pathogens.

Testing PCR Amplification of Bermudagrass DNA with Microsatellite Primers from Sorghum

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Department of Plant and Soil Sciences
Oklahoma State University
Subject Area: Biological Sciences

Bermudagrass (Cynodon sp.) is a warm-season, perennial species widely used for turf and forage in the southern United States and other warm regions in the world. The objective of this study was to test by Polymerase Chain Reaction (PCR) amplification the transferability of sorghum, Sorghum bicolor (L.), simple sequence repeat (SSR) marker primers to bermudagrass genomic DNA. Genomic DNA samples from three bermudagrass accessions [C. transvaalensis Burtt-Davy ‘T577’ (2n=2x=18), C. dactylon (L.) Pers. ‘Zebra’ (2n=4x=36), and C. dactylon (L.) Pers. ‘Tifton 10’ (2n=6x=54)], and one sorghum accession ‘Westland A Line’ as a control, were extracted with Zymo Research, Plant/Seed DNA Extraction Kit. These DNA samples were PCR amplified and screened using 354 sorghum genomic SSR primer pairs with two replications. Amplified PCR products were visualized using a Li-Cor 4300 DNA Analyzer. Primer pairs were scored as a band being present or absent. Sixty-two percent (62%) of the sorghum primers amplified reproducible bands for the African bermudagrass accession T577, 34% for Tifton 10, and 32% for Zebra. The Westland A Line DNA was amplified with 88% of the primers. This investigation indicated that sorghum SSR primer pairs are an efficient source of molecular markers for bermudagrass.

Global World of Business

April Taylor

McNair Scholar Program
McNair Scholar from Texas Christian University
Subject Area: Social Sciences

Traditional United States firms fail to efficiently conduct negotiations with businesses overseas. For that reason, this paper will examine the different negotiation strategies to help U.S. firms negotiate abroad. Specifically, I will investigate how Latin American and Chinese businesses prefer to negotiate. Four factors of cross-cultural negotiation affect the terms outcome: Relationship Development, Team Makeup, Time
Management, and Negotiation Strategies. The results indicate that it is possible for U.S. firms to successfully negotiate abroad, as long as the firm takes into account the diverse array of cultural differences.

Wireless Sensor Detection of Bovine Urination and Defecation

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Oklahoma State University
Subject Area: Physical Sciences & Technology

Temporal and spatial identification of bovine urination and defecation in riparian zones is a topic that has not been extensively explored. Research involving the measurement of timing and placement of bovine waste deposits has only been accomplished through visual observations carried out over short time periods. The objective of this project was to investigate the application of a wireless sensor system with an accelerometer to indirectly detect bovine urination and defecation. In the first phase of the experiment, bovine urination and defecation occurrences were analyzed to determine the approximate distance, timing, and tilt of tail movement. To create a data model, acceleration and tilt were added together to generate a representative curve of a bovine excrementous event. Based on the results, applying a wireless sensor system with an accelerometer can indirectly detect bovine urination and defecation. Sensing of movement in the z-direction provided the most powerful indication of excrementous events.

Switchgrass Germplasm Diversity Based on AFLP

James Todd
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Oklahoma State University
Subject Area: Biological Sciences

Switchgrass (Panicum virgatum) is a perennial grass native to North America, which recently has been identified as a biofuel crop. To increase biomass and fuel yield, it is currently being improved by traditional breeding. Long term improvement requires high diversity in germplasm. Molecular markers like Amplified Fragment Length Polymorphisms (AFLP) are a good unbiased way to measure genetic differences and diversity. AFLP will be performed on 56 specimens of switchgrass germplasm to assess the genetic diversity of tetraploid switchgrass. This information will be used to characterize diversity and relatedness between the different plants.

Photonic bandgap in sol-gel synthesized vanadia

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Subject Area: Physical Sciences & Technology

Photonic bandgap (PBG) materials modulate light in the same way semiconductors modulate electrons in transistors. In addition, PBG materials exhibit other interesting properties such as, slowing and localization of light both of which lead to optical enhancements. The present work demonstrates such PBG behavior in sol-gel synthesized V3O7, which consists of a short-range ordered ‘bird-nest’ structure. The discernable scattering peaks suggest the existence of a photonic bandgap. Interestingly, the material undergoes a phase transformation to V2O5 under 514 nm laser excitation as monitored by Raman spectroscopy. When the bird-nest structure is destroyed and randomized by ultrasonication, the scattering peaks disappear, and the aforementioned transformation requires ~40 times higher laser intensity. We attribute the lower power threshold for the transformation in the original structure to localization of light and creation of hot domains,
which is also supported by the transformation kinetics as captured by photoluminescence. Recently, the existence of PBG was also supported by optical transmission measurements.

**Inhibition of Prsenilin-1 Expression by JNK Inhibitor SP600125 Reduces Notch-1 Processing**

**Walter Topps and Hriday Das**
- McNair Scholar Program
- McNair Scholar from Tuskegee University
- Subject Area: Biomedical Sciences

Abstract not received

**Cystine Glutamate Exchanger Upregulation by Myo-Inositol induces Neuroprotection**

**Wilton Triggs and Brian Sims, M.D/Ph.D**
- McNair Scholar Program
- McNair Scholar from the University of Alabama at Birmingham
- Subject Area: Biological Sciences

Neonates have low levels of inositol in the brain. However, in brain-injured neonates, there is a higher concentration of inositol. Breast milk also contains a significant amount of inositol. Because of inositol’s higher concentration in developing babies and premature babies, which the latter has a higher risk for neurodegenerative diseases, and breast milk’s compositional containing high amounts of inositol, we hypothesized that inositol has neuroprotective characteristics. To investigate the neuroprotective characteristics of myo-inositol in B104 cells.

First, seven of the eight B104 cell flasks were treated with 500 millimolar Kainic acid to induce apoptosis excluding the experimental control. Next, of the seven treated glutamate treated flasks, six of the flasks were treated with increasing concentrations of myo-inositol (.1 μM, 1.0 μM, 10 μM, 100 μM, 1000 μM, and 1 mM). The cells were incubated for approximately 24 hours before preparation for western blot. The samples were probed for caspase-3 expression, actin, and xCT. In our preliminary studies, increasing concentrations of myo-inositol appear to increase expression of xCT protein levels. Our current studies are underway to demonstrate the role of inositol on cell death in vitro using fluorescent labeling and glutathione assay.

Myo-inositol may have a novel in neuroprotection. Further studies will be performed to elucidate its mechanism of action in relation to system xc-

**CHARACTERIZATION OF AN AZOREDUCTASE GENE FROM CLOSTRIDIUM PERFRINGENS**

**Daniel Trobare and Dr. Gilbert John**
- Department of Microbiology and Molecular Genetics
- Oklahoma State University
- Subject Area: Biological Sciences

Azoreductases are responsible for reductively cleaving azo dyes, which are commonly used in various commercial industries (i.e. soda, meats, tattoos, hair dyes). Important to human health is the fact that several types of bacteria within the gastrointestinal tract, including Clostridium perfringens, have been shown to metabolize azo dyes, and more importantly some of these bacteria have produced carcinogenic aromatic amines. Identifying and characterizing azoreductase genes from intestinal bacteria are difficult due to the lack of amino acid sequence homology among known azoreductases. Preliminary data using homology and alignment programs has identified a potential azoreductase gene from Clostridium perfringens. Our hypothesis is the putative azo gene encodes for an azoreductase and is responsible for metabolizing different
sulfonated and nonsulfonated azo dyes. The current study describes the cloning, heterologous expression, protein purification, and enzyme activity results for the putative gene.

**A Computational Study of the Geometric and Energetic Properties of Polyparaphenylene**

Markus Vasquez, Dr. John Mintmire, Dr. Thushari Jayasekera, Junwen Li  
Department of Physics  
Oklahoma State University  
Subject Area: Physical Sciences & Technology

The geometric properties of polyparaphenylene oligomers of varying length were calculated using NWChem. The geometric information obtained was then used to calculate the energies of the oligomers as a function of the torsion angle between the phenylene units. This data will be used to perform further computations investigating the relationship between the electronic properties of polyparaphenylene and the torsion angle. The goal of this research is to consider possible use of polyparaphenylene in photovoltaic devices.

**Crytic Diversity of the Bathygobius Soporator Species Complex**

Julia Vasquez, Ray Schmidt, Frank Pezold PhD  
McNair Scholar Program  
McNair Scholar from Texas A & M University Corpus Christi  
Subject Area: Biological Sciences

The frillfin-goby, Bathygobius soporator, is believed to be a geographically wide ranging fish species found along subtropical and tropical rocky shorelines of both sides of the Atlantic Ocean. Recent genetic studies have suggested that B. soporator actually represents a complex of several morphologically similar species. To test these studies, variance in cytochrome b of B. soporator was examined by extracting, amplifying, and sequencing the DNA specimens collected from Belize and locations within the Gulf of Mexico. The sequences we obtain were then compared to previously examined specimens from Brazil and West Africa. The findings will help to determine if B. soporator does in fact represent a complex of several morphologically similar species. Initial findings suggest there is divergence of B. soporator populations across the Atlantic.

**Attitude Differences of Future Teachers on Right-Wing Authoritarianism and Social Dominance Orientation**

Cristina Villanueva  
McNair Scholar Program  
McNair Scholar from St. Mary's University  
Subject Area: Education

Children learn from teachers what is appropriate and inappropriate behavior towards out-groups, whether or not that behavior is conscious or unconscious. This could have a devastating effect on a child’s life if the teacher is high in Right-Wing Authoritarianism (RWA) and/or Social Dominance Orientation (SDO). In this study, 308 future elementary and secondary teachers in the south central and north central U.S. were studied to determine their level of RWA and SDO. Their authoritarianism was measured by the RWA scale and their SDO was measured by the SDO scale in four universities across these two regions. Results indicate significant differences on RWA and SDO between the certification level of the teachers as well as the region of the U.S. Males were found to be higher in SDO across regions than females. Future studies will include more subjects across more regions of the U.S. and include higher numbers of males.
Genetic loci in the photoperiod pathway interactively modulate reproductive development of winter wheat

Shuwen Wang, Brett F. Carver, Liuling Yan
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Subject Area: Biological Sciences

Responses to photoperiod and low temperature are two primary adaptive mechanisms which enable wheat plants to synchronize developmental processes with changes in seasonal climate. In this study, initial stem elongation and heading date were characterized and mapped using recombinant inbred lines derived from two locally adapted hard winter wheat cultivars, Intrada and Cimarron. Genetic variation was associated with three major QTLs centered on Xbarc200 on chromosome 2B, PPD-D1 on chromosome 2D, and Xcfd14 on chromosome 7D. Integrative effects of the three QTLs accounted for 43% (initial stem length) and 68% (heading date) of the overall phenotypic variances. PPD-D1 is a reasonable candidate gene for the 2D QTL, PPD-B1 could be associated with the 2B QTL, but VRN-D3 (=FT-D1) was not linked with the 7D QTL, suggesting of a novel locus. Because the 2D QTL interacted with other two QTLs, they could play a role in the same pathway regarding photoperiod response.

The Relations between Mathematics ACT Achievement Scores and Test Anxiety, Controlling for Self-Concept

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Test anxiety is frequently considered in terms of tension, apprehension, and uneasiness about taking tests, which in turn, interferes with one’s cognitive functioning. Math tests can be extremely anxiety-provoking for individuals who have difficulty with mathematics concepts, which likely affects their performance. Although studies have been conducted on the impact of test anxiety, few studies have focused on the extent that test anxiety specifically predicts mathematics achievement scores on the American College Test. The aim of this study was to determine the variability in the achievement-to-test anxiety relationship that may be attributed to the degree to which a student perceives himself/herself to be able to perform on the ACT Math section. The sample included students from public schools across Oklahoma. Using multiple regression analyses, the results of this study provide suggestion about the amount that test anxiety, when controlling self-concept, predicts math achievement scores on the ACT.

-1,2-Dialkyl-5-nitro-2,3-dihydro-1H-indoles by a tandem reductive amination-SNAr reaction

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A tandem reductive amination-SNAr reaction has been applied to the synthesis of (‘)-1,2-dialkyl-5-nitro-2,3-dihydro-1H-‘indoles. A series of 2-fluoro-5-nitrobenzyl ketones bearing increasingly hindered alkyl groups was prepared using a Dakin-West reaction. Treatment of these ketones with primary amines and sodium cyanoborohydride in methanol at room temperature initiated the reaction sequence and provided good yields of the target heterocycles. The reaction is sensitive to steric hindrance and proceeds best with less hindered ketone substrates using primary amines that are unbranched at the alpha carbon.
Behavior, Time Management, and Foraging Modes of a West Indian Racer, Alsophis antillensis sibonius

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Subject Area: Biological Sciences

Alsophis antillensis sibonius is a West Indian Racer endemic to Dominica, Lesser Antilles. Snakes in the genus Alsophis once were known to occur on more than 100 islands from the Bahamas through Dominica in the Lesser Antilles. However, extirpations and extinctions throughout much of the range are attributable to habitat degradation, human persecution, and the introduction of invasive Indian Mongooses (Herpestes javanicus) and Black Rats (Rattus rattus). Despite the wide distribution of these snakes, little is known about their daily activity and time management. The purpose of this study was to investigate the daily activity, time allotment, and foraging modes of Alsophis sibonius. We conducted focal observations along trails in Cabrits National Park during ‘peak activity times’ in the morning and late afternoon. For each observation, we recorded habitat, initial posture, time spent moving, distance moved, presence or absence of tongue-flicking, and foraging behaviors. For habitat, we noted the level of disturbance, insolation, and substrate. Once a snake was identified and clearly had not responded to the observer, we conducted focal observations of 5’22 min. Observations were terminated when the snake was lost from view or reacted to the observer’s presence. We found that individual snakes often spent extended periods or even entire focal periods engaged in a single activity or posture. Collectively, snakes spent the greatest percentage of time foraging (32.3%), traveling (30.6%), and sprawled (28.2%). We observed several unusual behaviors during focal observations, including rooting and digging to obtain Anolis oculatus eggs and utilizing a unique ambush posture to forage for arboreal Anolis oculatus. Studies of this kind are essential in identifying key characteristics of different threatened species that help scientists to better understand how to protect and preserve them.

Hemispheric Differences in the Processing of Regular and Irregular Verbs

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Prior research has suggested that processing regular and irregular verbs involves different brain areas (Ulman et al., 2007). Regular verbs are those for which the past tense is formed via the addition of the suffix ‘ed (e.g., walk, walked). Irregular verbs are those whose past tense forms are exceptions to add ‘ed past tense rule (e.g., catch, caught). Ulmann et al. claimed that regular past tense forms are processed by a frontal/basal ganglia procedural memory system, and irregular past tense forms are processed by a temporal-parietal/medial-temporal declarative memory system. In present research, we explored the possibility that there are hemispheric differences in the processing of regular and irregular verbs. Forty-eight participants processed words presented either to the left or right hemispheres of the brain. Differences in the processing of regular and irregular verbs were observed.

Empowering Older, Rural Oklahomans and Their Communities: Assessment and Education on Contextual Barriers to Positive Nutrition and Health

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Subject Area: Social Sciences

Oklahomans’ health is among the worst in the nation. Rural Oklahomans are at greater risk than their urban counterparts for health challenges and typically have fewer health resources. Based on previous research and the Social Breakdown Model, we assert that older, rural Oklahomans can improve their health by making
better nutritional decisions. We posit that rural communities present unique barriers and resources via informal and formal support networks. Through these communities, older adults receive support necessary to make better nutritional decisions.

Using survey methodology, nutritional behaviors and socio-emotional variables were measured among a random sample of 404 rural Oklahomans aged 65 and older. Data will be presented revealing significant differences by gender and living arrangement. Specifically, men report greater need for assistance in dressing, eating, and preparing meals. Older adults living alone reported more concern about their overall physical health. Predictive regression analyses will also be presented.

ENERGY INTAKES OF FEMALE COLLEGIATE ATHLETES

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Subject Area: Biological Sciences

Adequate energy intakes of athletes may significantly influence their performance. Female athletes are at a particularly high risk of under-consuming energy because of unrealistic body image, social pressure, or perceived benefits of low body weight. The purpose of this study was to evaluate energy intakes of collegiate female athletes and compare them to the recommended energy needs. A convenience sample of female athletes was recruited at a large mid-western university. Variables measured included basal metabolic rate (BMR), dietary intakes of energy, and body composition. Recommended energy needs were determined using indirect calorimetry and appropriate activity factors for each athlete. Out of the 45 athletes participating in the study, 26 completed all the measurements. Only six subjects met their recommended daily energy needs. Our findings suggest that female athletes do not consume adequate amount of energy. Further research is needed to evaluate energy needs in a representative sample of female athletes.

Establishing Normative Data of Wellness Assessment Among College Students

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Subject Area: Physical Sciences and Technology

Normative data can provide one with a chance to see where they stand among others. Norms can be applied to current subjects in comparison testing. They can also represent typical and normative performance. Norms are highly reliable because they usually use a large sample size. According to Brown and Miller, one’s position among normative ranking can be a useful motivation to improve physical fitness, and allow students to compare their results with that of other college students.

College students are often interested as to where they stand among others; and because of the increase in obesity, many previously published norms are unreliable. In totality, this research should provide normative data for height, weight, body mass index, body fat percentage, muscular strength, muscular endurance, flexibility, cholesterol, and respiratory volume. The overall aim of this study is to provide a percentile table of normative data as a tool for college aged students.
Research in the Civil Engineering Lab at Oklahoma State University is being conducted on bond strength between strand and concrete in prestressed concrete. Currently, there is no standard test for evaluating strand to ensure quality for bond with concrete. Only a few test procedures are available to test bond strength between the strand and concrete but most are inconsistent in repeating results. The NASP Bond Strength test has been shown to produce repeatable results in separate labs across the country. This test is being researched and methods refined to provide a standard for the strand and prestressed concrete industry. In addition, bond strength in self-consolidating concrete has been compared to normal concrete. Self-consolidating concrete is a mix that requires no consolidating. Under the guidance and instruction of Dr. Bruce Russell, P.E., Josh Alberts and Saugata Purkait have led the research in these two topics.