LINC Scholars Research Abstracts

Abstract Titles in Alphabetical order
LINC Scholars' names at top of cell in right-hand column, with asterik*

Abstract Title	Abstract	Research Team *Denoted LINC Scholar
A GENERAL ACID-CATALYZED HYDRATION APPLICATION TO ACYCLIC ALKENES AND A SIMPLIFIED WAY TO DIFFERENTIATE BETWEEN REACTION MECHANISMS. 1	A general acid-catalyzed hydration application to acyclic alkenes was investigated. Terminal, internal and tetra-substituted alkenes were utilized. Correlation of the ionization potentials (IP's) versus relative reactivities of a variety of alkenes and differentiations of various mechanisms encountered were examined. Electronic and steric effects and the influence of the HOMO characteristics were proven to be important factors in these reactions.	**Hornbeak, Daquant*** **Hutcherson, Tiffany*** **Dr. John K. Coleman, Department of Chemistry, Langston University, Langston, OK;** **Dr. Donna Nelson' Department of Biochemistry, University of Oklahoma, Norman, OK.**
A MODEL OF CONTEXT AWARENESS, COMBINING GLOBAL POSITION SYSTEM AND SENSORS **2**	The model of Context awareness is integrated to inform us about our surroundings from satellite and analysis user's situation. Moreover, the model of context awareness must provide services that consider user's mobility and surroundings. Therefore, the model needs a processing system that can learn user's situation and provide service by real time. This paper proposes model of context awareness for user situation analysis and for support service combining Bayesian Neural Network, MLP and Ontology. The proposed Model designed available structure by user's Mobile Device. With the Bayesian Neural Network, for system evaluation, we estimate service satisfaction with provided services. The objective of this research is to improve the awareness of a solider in the field of duty. Why do we need context awareness? Because it provides a unique service that any other device can. Other device that provides similar result takes time, lot of data evaluation, and no real time feed. With this context awareness a user can have a view of a situation at a real time with less data evaluation, and at real time. Context awareness is a model to provide adequate services without limit in time and space without making users aware of computers and networks.	**Osei, Richard*** **Dr. Peter Taiko; Department of Computer Science Langston University, Langston OK.**
A PREVENTION PROGRAM ON REDUCING THE RISK OF TYPE II DIABETES IN HISPANIC FAMILIES **3**	Obesity has become a growing problem throughout the United States, and is also the cause of 112,000 deaths per year. Obesity is also the leading cause of Diabetes 2, Metabolic Syndrome, and Cardiovascular Disease. Overweight and obesity is most prevalent in minorities. Research has shown that obesity is the result of genetics, culture, environment, and socioeconomic factors. High rates of Obesity were observed in Hispanic children. The purpose of the study described was to provide an in depth assessment, counseling, and referral of nuclear families with overweight or obese children at risk for Type 2 Diabetes. The study provided early detection of the risk of Type 2 Diabetes, Coronary heart disease, and metabolic disorders, counseling on risk factors, nutrition and physical activity, and the opportunity to participate in the preventive intervention through the "Promotora Program".	**Ekpo, Felicia*** **Dr. Jimenez, Dr. Rojas; University North Texas HSC, Ft. Worth, TX;** **Langston University, Langston, OK**

A SEARCH FOR THE HIGGS PARTICLE IN 2 TEV PROTON - ANTIPROTON COLLISIONS AT THE D-ZERO EXPERIMENT **4**	The Higgs particle is the last undiscovered fundamental particle of the Standard Model. In this theory the Higgs particle is responsible for giving fundamental particles, like the electron, their mass. Recent data from CERN's LEP collider and Fermilab's Tevatron collider are suggesting that the Higgs particle may be seen in the D-Zero experiment which is currently taking data. At Langston University we are conducting a detailed analysis of the data from the D-Zero Experiment for a Higgs search by calibrating the data, understanding the efficiencies of the detectors, simulating specific events and comparing them with collected data. D-Zero is a collaboration of more than 400 scientists from 17 countries around the world.	**Trotter, Barry*** **Dr. John K. Coleman, and Dr. Tim McMahon. Department of Physical Sciences, and the Department of Mathematics1, Langston University, Langston, OK**
A STUDY OF CADINIUM ZINC TELLURIDE (CZT) NOISE IN THE SWIFT BAT INSTRUMENT **5**	Swift is a NASA mission that's scheduled for launch in 2004. It will be looking in the distant universe for gamma ray bursts (GRBs). The first gamma ray burst was seen in 1967 by satellite borne detectors looking for violations of the Nuclear Test Ban Treaty. Swift will determine the origin of GRBS, tell us how the blast wave interacts with its surroundings, and identify classes of bursts. The Swift instruments include the Burst Alert Telescope (BAT), the X-Ray Telescope (XRT), and the Ultra-Violet Optical Telescope (UVOT). The BAT makes the initial detection of the gamma ray burst, determines a position for that burst, and sends that position from the telescope to ground control. The cadmium-zinc-telluride (CZT) detectors are the heart of Swift's Burst Alert Telescope (BAT). The detectors will enable scientists to detect and accurately position the gamma ray bursts. The CZT detectors create high-resolution images from high- energy photons, particles of light far more energetic than visible light. Some of the CZT detectors are producing a noise that can falsely identify a GRB. Many factors are considered concerning the CZT noise, including temperature, bad connections, and the overall electronics of the telescope. My project included figuring out which detectors were responsible for the noise. This was done using a program written in C and data files from the detectors. My research showed that there are classes of noises, which have different energy spectrum characteristics. The program we made will allow scientists to take any data file and figure out which detectors are producing the disturbing noise. Funded and Supported by NASA.	**Harvey, Desmond*** **Harris, Steven *** **Dr. Timothy McMahon, Dept. of Chemistry and Physical Sciences and the Dept. of Mathematics, Langston University, Langston, OK**
ABC MUTANTS IN C. ELEGANS **6**	RNA interference (RNAi) involves the introduction of double-stranded RNA into the cell resulting in the silencing of specific genes. ATP-Binding Cassette (ABC) transporters are proteins that transport substrates across intracellular and extracellular membranes. It has been found that some of the ABC transporters are necessary in order for RNAi to occur in the nematode *Caenorhabditis elegans*. We are interested in the characterization of ABC transporters in *C. elegans* because of their roles in RNAi. Sixty ABC transporters have been identified in the complete genomic sequence of *C. elegans*. In this project, worms with deletions in ABC genes were obtained from the *C. elegans* gene knockout consortium. We have outcrossed these strains in order to get rid of unwanted mutations that may have been introduced during the course of generating the deletions in ABC genes. After a series of breeding, mutant strains homozygous for ABC gene deletion were confirmed as homozygotes via PCR. We have successfully outcrossed 9 ABC mutant strains. These strains will be outcrossed for 2-3 more times, after which, there will be a search for phenotypes.	**Todd, Syndia*** **Dr. Lisa Timmons, Department of Biology, Langston University, Langston, OK.** **Department of Molecular Biosciences, The University of Kansas Lawrence, KS**

ALLEOPATHIC EFFECT OF MIMOSINE AND ALBIZZIIN ON SEED GERMINATION AND SEEDLING GROWTH **7**	Mimosine and albizziin are non-protein amino acids produced by several legume species including Mimosa, or Silk-Tree (*Albizzia julibrissin* Durazz). Several reports indicate that mimosine has fungicidal and insecticidal properties and may be involved in allelopathy. In preliminary studies both compounds have been shown to inhibit seed germination and seedling growth in sicklepod (*Cassia obtusifolia* L.) and hemp sesbania [*Sesbainia exaltata* (Raf.) Rydb. Ex A.W. Hill] at 10-3 M. Further studies with hairy vetch (Vícia villòsa Roth) and butterfly pea (*Clitòria mariàna* L.) indicate that mimosine at 10-3 M inhibits vetch seed germination, but had little effect on butterfly pea germination. In addition, little effect was noted on radical elongation of either species. This work will be continued and will include radish (*Raphanus sativus* L.), generally a more sensitive species to growth regulators, in the germination assay. Preliminary studies on the separation of mimosine and albizziin using thin-layer chromatography will be conducted and this technique will be used in examining legume forages for non-protein amino acids in further work.	**Hutcherson, Tiffany*** **Dr. John K.. Coleman , Dr. R. D. Williams; Department of Chemistry and Research & Extension, Langston University, Langston, OK**
AMYGDALOID MODULATION OF GASTOINTESTINAL PERMEABILITY **8**	Previous research has shown that stress can enhance gastrointestinal permeability leading to diarrhea. The amygdala is a key limbic structure involved in autonomic responses to stress and anxiety. The goal of this research is to determine the role the amygdala plays in the regulation of gastrointestinal permeability. Corticosterone is a steroid hormone that upon stereotaxic insertion into the amygdala increases anxiety in rats. Fischer-344 rats (n=8) underwent amygdala implant surgery with either cholesterol (30 □g) as a control or corticosterone (30 □g) pellets. Following one week of recovery, colonic tissue was removed and mounted in the Ussing Chamber to determine permeability through measurements of potential difference (PD) and short circuit current (I_{sc}) via Ohms Law where V (voltage) = I (current) R (resistance). The conductance/permeability (G) can be found as the reciprocal of resistance (1/R= conductance). Our results have shown that in corticosterone implanted rats (n=4), permeability was not statistically different from cholesterol implanted rats (n=4). However, we anticipate that in response to water avoidance stress (WAS), a psychological stressor, corticosterone implanted rats will have an enhanced permeability compared to cholesterol controls.	**Miller, Nichole*** **Dr. B. Greenwood-VanMeerveld: Center for Neuroscience, University of Oklahoma Health Sciences Center. Oklahoma City OK** **Langston University, Langston OK**
ANALYSIS OF CYC1 PROMOTER IN CANDIDA ALBICANS **9**	Background: The yeast species, *Candida albicans,* is an opportunistic pathogen that can be found in the gastrointestinal and urinal tracts of most humans. When the body undergoes certain changes *Candida albicans* often shows as the common infections known as: diaper rash, yeast infection, and oral thrush. These trivial infections are easily healed with antifungal treatments. However, in humans whose immune systems have suffered; such as those with HIV, chemotherapy patients, and those undergoing surgery, *C. albicans* may prove fatal. The current treatments to suppress C. *albicans* infections cause harm to the already weakened systems of those patients. *CYC1*, cytochrome c, isoform 1, is an electron carrier in cellular respiration. In oxidative phosphorylation, *CYC1* carries electrons from the cytochrome bc1 complex to cytochrome oxidase. Objective: to find the significance of the *CYC1* promoter regulatory elements in *Candida albicans* through deletions of it. Materials and Methods: Each deletion is placed in a plasmid that already contains the *Renilla* luciferase gene, from *Renilla reniformis*, the sea pansy. The plasmid is cloned using E. coli. After cloning the plasmids each	**Blocker, Tomica*** **Dr. David McNabb, Department of Molecular Biology, University of Arkansas, Fayetteville AR** **Department of Biology, Langston University, Langston OK**

	is transformed into C. albicans. Using the *Renilla* luciferase system we are able to detect the expression of the *CYC1* promoter. If the desired promoter is present and effective, a bioluminescence is detected. Results: One of the plasmids was successfully transformed. It showed luciferase activity. Conclusions: although the plasmid that transformed was truncated, the CYC1 promoter was still effective. Future goals: to transform the other five plasmids and determine analyze the complete CYC1 promoter	
ANALYZING THE PERFORMANCE OF THE SWIFT MISSION BURST ALERT TELESCOPE IMAGING SOFTWARE FOR MEASURING GRB DURATION TIMES **10**	The Swift satellite is designed to detect and observe Gamma Ray Bursts (GRBs) and then analyze their spectra and light curves. This satellite consists of three instruments: the Burst Alert Telescope (BAT), Ultra-Violet Optical Telescope (UVOT), and the X-ray Telescope (XRT). For my research, I will be focusing on the performance of the BAT, which is the primary instrument on the Swift satellite for collecting Gamma Ray data. The BAT is unlike previous telescopes in the fact that it has a very large field of view. Swift is unique in its ability to autonomously slew itself quickly upon the detection of a GRB. Therefore it is very effective in observing GRBs.The performance of the BAT will be measured with the comparison to the Compton Gamma Ray Observatory (CGRO). A 1000 Burst simulation was conducted on the Swift satellite to cover one year of operation. Light curves from BATSE (Burst and Transient Source Experiment), an instrument on CGRO, were used as input to the simulation, and a corresponding BAT light curve was produced. The light curves produced by the imaging software will be used by Battblocks, software that analyzes images, to create duration time intervals for the GRBs. GRBs create a wide variety of light curves. Many of these light curves have large fluctuations and different intensities within the burst. These fluctuations can cause conflict when trying to establish duration time intervals. The light curves as well as the duration times from both the BATSE and the BAT will be compared.	**Blythe, Derek*** **Brison, Shanequah *** **Dr. Tim McMahon Code 661: The Swift Team Langston University, Langston, OK** **NASA Goddard Space Flight Center, Greenbelt, MD.**
ANTIBIOTIC RESISTANT MICROORGANISMS ISOLATED FROM A SEWAGE TREATMENT WATER SITE **11**	Bacteria isolates containing antibiotic resistance to either Penicillin, or Erythromycin, or Streptomycin, were isolated from a sewage treatment water site at Keystone State Park. Bacterial counts were obtained, based on two different general all-purpose media Maconkey agar and Nutrient agar, to the log of 10 colony forming units. Growth patterns were then determined for microbes in preparation identification of the Binomial system of nomenclature classification of selected gram-negative microbes isolated from Maconkey agar.	**Smith, D.*** **Harris, T.*** **Braggs, S.*** **Baker, W.*** **Department of Biology, Langston University, Langston, OK**
APPLICATIONS OF MODULAR RINGS IN NUMBER THEORY **12**	In the era of technology it is almost impossible to imagine to start any type of computation without using computers or supercomputers. However, there are still problems that computers cannot help without applying some knowledge of advance mathematics. The goal of this display is to show how to apply Abstract Algebra, or more precisely, Modular Ringsin some other disciplines like Number Theory or Cryptology. By applying the natural projection epimorphism p: Z ! Z m from the ring of integers Z to a modular ring Z m and orders of cyclic subgroups of the group of invertibles V m it will be possible to solve some problems similar to the Fermat Theorem and problems related with divisibility of large numbers.	**Crane, Domonick*** **Bucki, Andrew*** **Department of Mathematics, Langston University Langston, OK**

CHANGES IN THE LEVELS OF ACTIVE MATRIX METALLOPROTEINASES-3 AT DENERVATED NEUROMUSCULAR JUNCTIONS **13**	Agrin is a heparin sulfate proteoglycan that directs the aggregation of Acetylcholine Receptors (AChRs) at the neuromuscular junction. Acetylcholine receptors are stimulated by the release of acetylcholine from the motor neuron. This directly leads to the activation of the muscle cell. Agrin is a component of the extracellular matrix, and agrin is cleaved from the neuromuscular junction by the enzymatic protein Matrix Metalloproteinase-3 (MMP-3). We hypothesize that MMP-3 controls the structure and function of the neuromuscular junction by regulating the amount of agrin present at the neuromuscular junction. When the nerve to a muscle is cut (denervation) there is a complete loss of synaptic activity at the neuromuscular junctions. We wished to determine if this change in synaptic activity altered the expression or activation of MMP-3 at the neuromuscular junction. The right brachial nerve that supplies the frog cutaneous pectoris muscle was surgically removed. Two weeks later both the denervated right cutaneous pectoris muscle and the left innervated control muscle were removed from the frogs. The muscles were further divided into regions that contained the neuromuscular junctions, and regions that contained just muscle. The proteins in the tissues were separated by SDS-Polyacrylamide gel electrophoresis, and then electro-blotted onto a nitrocellulose membrane. The membranes were then probed with antibodies that recognize MMP-3. We found that there was an increase in the amount of inactive MMP3 at both the muscle and neuromuscular junctions of denervated frog cutaneous pectoris muscles. These results support the hypothesis that muscle activity can influence the activation of MMP-3 which in turn will remove agrin from synaptic basal lamina. Altering agrin removal may lead to the aggregation or removal of agrin, and thus direct the growth or retraction of the synapse.	**Burdex, Ashley*** **Dr. Mike Werle, Kansas University Medical Center, Kansas City KS** **Langston University, Langston OK**
CHARACTERIZATION OF INTRINSIC CHOROIDAL NEURONS IN MYOPIC CHICK WHOLE MOUNTS **14**	Recent investigations have demonstrated that the choroid plays a vital role in regulation of myopic defocus. The current study suggests that the changes in choroidal permeability, thickness, and blood flow that occur during this ocular compensatory regulative behavior may be stimulated by intrinsic choroidal neurons (ICN). The objective was to determine the presence of ICN within the choroid, and to localize ICN in reference to choroidal blood vessels. Immunohistochemistry involving double labeling with anti-galanin and anti-NOS (nitric oxide synthase) antibodies, followed by secondary antibody labeling with anti-rabbit and anti-mouse IgG conjugated to alexafluor 568 and 488 respectively, were used to analyze the presence and localization of ICN in whole mounts of chick choroids of normal 1 and 2 week old chicks. Additionally, NADPH-diaphorase was utilized to identify nitric oxide containing ICN whole mounts which were also treated with anti-smooth muscle actin to localize choroidal blood vessels. Double immunolabeling of choroidal whole mounts revealed the presence of distinct galanin-positive ICN and NOS-positive ICN in the tissues, as well as the co-localization of galanin and NOS in these neurons. Results from NADPH-diaphorase staining, NOS and smooth muscle actin immunolabeling suggest that ICN are not localized in the blood vessels, but instead are located throughout the stroma of the chick choroids. Results of these studies provide the first characterization of ICN in the chick choroid and demonstrate distinct populations of galanin-positive and NOS/NADPH-diaphorase positive neurons throughout the choroidal stroma.	**Anderson, Richard*** **Dr. J. Summers-Rada, Department of Cell Biology;** **Dr. L. Palmer, Dept. or Urology;** **Oklahoma University Health Science Center, Oklahoma City OK** **Department of Chemistry, Langston University, Langston OK**

CHARACTERIZATION OF ORGANIC MOLECULES IN MOLECULAR DEVICES **15**	One area of molecular electronics involves using bistable molecules, such as rotaxanes and catenanes as the active components in solid-state devices. These bistable molecules have been used in molecular memory and logic circuits. Such devices are fabricated by transferring a Langmuir-Blodgett molecular monolayer onto a substrate patterned with silicon electrodes, then metallic top electrodes are evaporated onto the molecular layer through a shadow mask. Titanium, because of its high reactivity, is used as the top electrode material. The titanium reacts with the monolayer, creating a protective layer that prevents subsequent metal from penetrating through the monolayer. In order to determine what functional groups the titanium reacts with, monolayer/titanium films were made and studied spectroscopically using a sensitive reflectance/absorption Fourier Transform Infrared (FTIR) spectrometer. Films of eicosanoic acid, dimyristoylphosphatidic acid (DMPA), a [2] catenane, and a [2] rotaxane were measured. In addition, monolayers on a variety of substrates, including silicon dioxide, silicon (111), and platinum, were analyzed. The FTIR data shows that for dense films the titanium reacts with the upper groups and does not destroy the functional part of the molecules. Characterization of these thin films explores the titanium/molecule interface, which will directly affect the electrical properties of the device.	**Harvey, Desmond, D.*** **Dr. E. DeIonno** **Dr. J. R. Heath** **California Institute of Technology, Pasadena CA** **Department of Chemistry, Langston University, Langston OK**
CHARACTERIZATION OF MET-INDUCED CELL MOTILITY **16**	The intensifying research of many scientists has driven a vast amount of progress in understanding mechanisms of the MET tyrosine kinase receptor and its role in the spread of cancer (metastasis). The MET receptor is proto-oncogene, which is a normal gene that can become a cancer agent (oncogene) due to mutations or increased expression. The Hepatocyte Growth Factor (HGF) also known as the scatter factor (SF) plays a significant role in the motility interaction with MET receptor. HGF is the activating ligand of the trans-membrane receptor MET. However, the detailed relationship of the HGF/SF and Met is not yet clear. Previous mutagenesis data has indicated that NK1 (the N-terminal and first kringle domains of HGF) is responsible for high affinity binding of HGF to the Met receptor. However, NK1-Met binding affinity is too weak to be therapeutically viable. Defining how wild-type NK1 and high affinity NK1 mutants interact with Met in cell scattering and cell invasion assays can provide insights on approaches to inhibit Met-driven tumor metastasis. The objective of this research project is to develop and troubleshoot biological assays to evaluate Met receptor activation. The cell-based assays were successfully developed, enabling investigation of engineered NK1 mutants on Met receptor activation using scatter and invasion assays. We have shown that the high affinity NK1 mutant 20-1 is active in the cell-based biological assays. Previous researchers have identified mutations that transform NK1 from an activating into an inactivating ligand. Collectively, these results support future exploration to more fully characterize its biological effects and its potential as a therapeutic.	**Vann, Kendra R.*** **Dr. Doug Jones,** **Dr. Jennifer Cochran,** **Department of Bioengineering, Stanford University, Stanford, CA** **Langston University, Langston, OK**
CLONING OF PEST MOTIF OF P110 SUBUNIT OF PHOSPHATIDYLINOSITOL 3-KINASE FROM RETINA	It has been proposed that polypeptide sequences enriched in proline (P), glutamic acid (E), serine (S), and threonine (T) which are known as "PEST" motifs, serve as putative intramolecular signals for rapid proteolytic degradation by calpains. Calpains are calcium-dependent cysteine proteases that regulate various enzymes, transcription factors and structural proteins through limited proteolysis. Numerous studies have demonstrated a multifunctional role of phosphotidylinositol 3-	**Wallace, T.*** **Dr. R. Martin,** **Department of Cell Biology, University of Oklahoma Health Sciences Center Dean McGee Eye**

	kinase (PI3K) in intracellular pathways, including promotion of cell growth, regulation of cell differentiation and control of cell metabolism. In retina, PI3K is believed to protect the retina against stress-induced apoptosis. In some neuronal cell types, such as cerebellar granular neurons and PC-12 cells, receptor activation of PI3K has been shown to protect these cells from stress-induced neurodegeneration.	**Institute, Oklahoma City, OK.** **Dr. S. Williams, Department of Biology, Langston University, Langston, OK**
COMPARING SELF-INITIATED MOBILITY IN INFANTS WITH AND WITHOUT NEUROLOGICAL DISABILITY **17**	Infants with neurological disabilities, such as cerebral palsy (CP) and Down syndrome (DS), show severe delays in motor and cognitive development relative to chronological age. Involvement of neural plasticity as a treatment of such neurological disorders is increasingly being seen. Previous studies have found that interventions involving sensory linked motor performance have been critical in facilitating motor improvement. The purpose of this study was to compare self-initiated mobility in children with CP and DS. Three infants, ages 8, 9, and 22 months, with diagnoses of no CP, DS, and CP respectively, participated in the study. The infants were videotaped in 5 minute trials using the Self-Initiated Prone Progression Crawler (SIPPC), a mobility aid that assists in infant crawling. Each recorded trial was coded and scored using the Mobility Scale. Movement and speed data from the trials showed the infants with CP and DS performed with less amplitude and purpose when compared to the typically developing child. Differences were also noted in the child with CP, displaying the lowest scores in coordination and movement. Asymmetry was also noted in the initiation movements of the children with CP and DS. However, overall test scores improved over time, suggesting that the SIPPC is an effective tool, taking advantage of experience-expectant and experience-dependent characteristics of learning and skill acquisition.	**Pollard, Vaniecea*** **Dr. T. Kolobe, Department of Rehabilitation Sciences, University of Oklahoma, Oklahoma City OK** **Langston University, Langston, OK**
CONSTRUCTING THEORETICAL THREE DIMENSIONAL MODELS OF GLYCOSYLTRANSFERASES INVOLVED IN HEMICELLULOSE SYNTHESIS USING HOMOLOGY MODELING **18**	Plants are an inexpensive source of carbon, and therefore, are an excellent candidate to generate an efficient biofuel. The process of producing biofuel from biomass requires the deconstruction of lignocellulose (cellulose, hemicellulose, and lignin) into fermentable sugars. Unfortunately, hemicellulose binds tightly to cellulose and lignin forming a sturdy connection to the plants walls. Hemicellulose is also composed of high percentages of pentose monosaccharides, which are difficult to ferment. The complications of fermentation caused by hemicellulose are the main focus of this research. This study examines one method of better understanding hemicellulose, which is to create theoretical three dimensional models of the glycosyltransferases responsible for hemicellulose synthesis. The technique of homology modeling is used to construct the theoretical models. The names and amino acid sequences (query sequences) of genes encoding glycosyltransferases involved in hemicellulose synthesis were identified. MODELLER and BLAST programs were used to pinpoint protein sequences (templates) from the Protein Data Bank containing high similarities to the residues in the query sequences. After which, MODELLER was used for sequence alignments with each of the query sequences and templates previously identified. Finally, MODELLER calculated a theoretical model for each sequence alignment. The models chosen received the best MODELLER objective function score. Unfortunately, two of the models contain longed strands of disordered amino acids and will not give any indications to the proteins function in that region, and were therefore omitted from the results.	**Blythe, Karole*** **Dr. Paul Adams [+]Division of Physical Biosciences at the Lawrence Berkeley National Laboratory, Berkley, CA** **Langston University, Langston, OK**

CONVERSION OF DYNAMIC EXPLORER HAPI/LAPI DATA TO CDF'S FOR ARCHIVING AND FOR EASY DATA BROWSING ANALYSIS **19**	The Dynamic Explorer (DE) program consisted of two satellites, the DE-1 and DE-2. They were launched together on Aug 3, 1981 to study the coupling of energy, electric currents, electric fields, and plasmas between the magnetosphere, ionosphere, and the atmosphere. The DE-1 satellite was placed in a highly elliptical orbit having an apogee of 4.65 Earth radii (6378 km per Earth radius) and a perigee altitude of 675 km, whereas DE-2 had a nearly circular orbit with a required perigee to be below 350 km and a apogee above 1000 km. This project focused on refurbishing the data from the High Altitude Plasma Instrument (HAPI) on DE-1 and the Low Altitude Plasma Instrument (LAPI) on DE-2, so that it can be accessed and used by modern data accessing tools. Converting the data to a Common Data Format (CDF) will be helpful in building generic software. This allows scientists to view trends or events in different data sets. The SKTEditor, a CDF tool developed by the Space Physics Data Facility (SPDF), is used to develop the initial empty CDF with metadata. The IDL programming language is used to convert and store the HAPI and LAPI data into CDF's that are accessible to the SPDF data browsing system, CDAWeb. The HAPI and LAPI data is raw data that is very difficult to use and virtually unreadable. Converting the data to a CDF adds to the CDAWeb holdings and increases its accessibility for multi-instrument data analysis.	**Brison, Shanequah*** **Dr. Shing Fung and Robert M. Candey, NASA Goddard Space Flight Center, Code 612.4-Space Physics Data, Greenbelt, MD** **Computer Science Department, Langston University, Langston, OK,**
CORRELATION OF THE EUKARYOTIC INITIATION FACTORS3 (EIF3) SUBUNITS AND HUMAN COLON CANCER **20**	EIF3 is one of the translation initiation factors and it consists of 13 subunits. It has been reported that the expression levels of some eIF3 subunits were elevated in cancer compared with normal cells. In this study, we determined the expression level of three eIF3 subunits, p35, p36 and p116, in normal and cancer colon tissues using Western blot. We found that the protein level of p35 and p36 in colon cancer tissues were elevated compared to paired normal tissues. However the expression level of p116 remained constant in every sample tested. We also investigated the expression of these three proteins in a model human colon cancer cell line Caco-2 which differentiate into small intestinal-like cells after confluence. Using two common differentiation markers, alkaline phosphatase and sucrase, we found that the expression level of p35 and p36 decreased following Caco-2 differentiation whereas the expression level of p116 remained unchanged. Taken together, we conclude that the expression of p36 and p35, but not p116, of eIF3 correlates with colon carcinogenesis	**Brouillette, Merrill*** **Dr. Jing Qi, Dr. Zizheng Dong, Dr. Jian-Ting Zhang; Department of Pharmacology & Toxicology, Walther Oncology Center/Walther Cancer Institute, I.U. Cancer Center, Indiana University School of Medicine, Indianapolis, Indiana** **Department of Chemistry, Langston University, Langston OK**
DECIPHERING STRUCTURAL FEATURES IMPORTANT FOR HETEROAROTINOID GROWTH INHIBITION ACTIVITY IN NORMAL AND CANCEROUS OVARIAN CELLS	**Objective:** The hypothesis is that specific structural features of the flexible heteroarotinoid (Flex-Het) chemicals are responsible for their differential killing of cancer cells over normal cells. Our objective was to determine which Flex-Het structural features are responsible for the cell killing activities. **Methods:** Cancer cells and normal cells were plated into 96 well plates. The cultures were incubated with a series of Flex-Hets that differed by single structural alterations over a range of concentrations from 0 to 10 micromolar. After 72 hours treatment, the CellTiter 96 Assay was used to measure the number of cells remaining after each treatment. For each compound, the potency was derived as the concentration that induced 50% cell kill, and the efficacy was derived as the maximal percent cell loss observed. **Results:** Both compounds with and without N heteroatoms exhibited	**McDaniel, Sheree*** **Dr. D. Benbrook, Department of Obstetrics and Gynecology, University of Oklahoma Health Sciences Center; Oklahoma City OK** **Biology Department Langston University, Langston, OK**

21	differential effects on cancer vs. normal cultures. The potencies and efficacies of compounds with the N heteroatoms were weaker than their counterparts without heteroatoms. Other changes to the drug structure had minor consequences. **Conclusions:** Since the compounds with N heteroatoms were weaker than their counterparts without heteroatoms, we propose that the N heteroatom decreases the cytotoxicity in general and that other structural features are important for the differential cytotoxity on cancer over normal cells.	
DISTRIBUTION OF INTRINSIC CHOROIDAL NEURONS IN CHICK WHOLE MOUNT **22**	**Objective:** Recent investigations have demonstrated that the choroid plays a vital role in regulation of myopic defocus. The current study suggests that the changes in choroidal permeability, thickness, and blood flow that occur during this ocular compensatory regulative behavior may be stimulated by intrinsic choroidal neurons (ICN). The objective was to determine the distribution of ICN in the chick choroid and the possible changes in distribution of the neurons during different stages of myopia. **Methods:** Eyes were enucleated from untreated, day old chicks as well as chicks undergoing form deprivation for 4 or 7 days to induce myopia. NADPH-diaphorase was utilized to identify nitric oxide containing ICN in choroidal whole mounts and cross sections. The neurons were counted using a dissecting microscope and diaphorase stained whole mounts and cross sections were viewed with light microscopy at magnifications of 40 – 100X. **Results:** Quantitation of ICN in choroids of untreated, day old chicks indicated that the neurons were most abundant in the superior and temporal regions of the eye with averages of 45% and 30% respectively, and less abundant in the nasal and inferior regions with averages of 19% and 8% respectively. The number and distribution of ICN was similar in control and myopic eyes. Additionally, examination of whole mounts and cross sections indicated localization of the neurons on the retinal side of the choroid. **Conclusions:** Results of these studies indicate that ICN are most abundant in the superior and temporal regions of the choroid and less abundant in the nasal and inferior regions. The finding that the neurons are located on the retinal surface suggests that ICN may play a role in controlling the blood vessels of the choroidal capillaries. Although the number of ICN was similar in control vs. myopic eyes, this may indicate less density of the neurons during elevated stages of myopia since the myopic eye is larger.	**Anderson, Richard*** **Dr. L. Shelton,** **Dr. J. Summers Rada,** **Department of Cell Biology, University of Oklahoma Health Sciences Center, Oklahoma City OK** **Department of Chemistry Langston University, Langston, OK;**
DEFINING HOW CA^{2+} SIGNALLING IS PERTURBED IN EARLY-ONSET ALZHEIMER'S DISEASE	Alzheimer's disease (AD) is an incurable, progressive degenerative disease of the brain, which leads to cognitive and behavioral impairment and produces two hallmark abnormalities: Amyloid-□(A□) plaques, and intracellular neurofibrillary tangles. A□ is a fragment of a protein that is snipped from Amyloid Precursor Protein (APP). The relationship between Ca^{2+} signaling and APP mutations that cause early-onset Alzheimer's disease (EOAD) is not yet clear. In a healthy brain, these protein fragments would be broken down and eliminated. In AD, the fragments accumulate to form hard, insoluble plaques. The objective of this research was to gain insight of *how* EOAD-causing mutations impact Ca^{2+} signals. I investigated the APP mutant T714I and V717L, which are considered to be aggressive EOAD, and used genetically-encoded fluorescent sensors to measure the concentration and localization of cellular Ca^{2+}. The central hypothesis was that the EOAD APP mutants T714I and V717L will cause Ca^{2+} dyshomeostasis. I discovered that the EOAD mutant	**Vann, Kendra R.*** **Dr. Amy Palmer** **Department of Chemistry and Biochemistry, University of Colorado, Boulder CO** **Department of Chemistry Langston University, Langston, OK**

23	V717L had a significant ($P < .05$) effect on the resting Ca^{2+} levels in the ER compared to the APP wild-type, where the mutant caused a decrease in resting Ca^{2+} levels, while the APP mutant T714I did not. When γ-secretase was inhibited V717L showed a significant increase ($P > .005$) occurred in the Ca^{2+} ratio. The γ-secretase inhibition data also reveals a significant decrease ($P>.005$) in T714I. These results support experimental use of APP mutants as a useful tool for understanding the mechanisms of Ca^{2+} dysregulation in Alzheimer's disease.	
EFFECTIVENESS OF BENOMYL TO INHIBIT MYCELIAL GROWTH OF COLLETOTRICHUM GLOEOSPORIOIDES **24**	The objective of my experiment is to determine if benomyl (Benlate 50 wp) inhibits the growth of Colletotrichum gloeosporioides which causes anthracnose disease on plants. For instance, one nursery in eastern Oklahoma estimates a loss between $200,000 to $500,000 each year from disease. Anthracnose symptoms include leaf spots and stem lesion that increase in size over time. Furthermore, benomyl was added to potato dextrose agar (PDA) after autoclaving to determine the effective concentration to obtatin 50% inhibition of mycelial growth. Agar was inoculated by centrally placing a 0.7 cm diameter plug, upside down on each plate. Each concentraction had five replications and the experiment was conducted 3 times. Radial growth of 2 strains of C. gloeosporioides was measured daily for five days by measuring colony diameter twice perpendicularly. Percent inhibition was calculated using the following equation: % inhibition= [(mean nonamended PDA- mean fungicide amended PDA)/ mean nonamended PDA] * 100. This will help to determine whether the fungicide is effective in controlling mycelial growth of C. gloeosporioides. In conclusion, benomyl has been shown to consistently inhibit growth in each experiment. This research identifies fungicides and the amounts that may reduce damage caused by C. gloeosporioides.	**Sherman, Adrian T.*** **Dr. K. E. Conway, Dept. Plant Pathology, Oklahoma State University, Stillwater, OK** **Langston University, Langston, OK**
EFFECT OF ISOMETRIC HANDGRIP AND COLD PRESSOR STIMULUS ON MEAN ARTERIAL PRESSURE IN HUMANS	The body responds to stressors like exercise and pain by modulating various components of the cardiovascular system. For example, elevation of muscle temperature has been shown to increase mean arterial pressure (MAP) during isometric exercise in humans. Isometric handgrip and cold pressor test (CPT) have been previously used to evoke muscle afferents and pain sensory responses, respectively. Both are used to examine a variety of cardiovascular responses in humans. This study investigates the MAP response to CPT and isometric handgrip combined. **Hypothesis:** We hypothesize that there will be a significant difference in MAP response during combined cold pressor and handgrip, compared to handgrip and cold pressor alone. **Methods:** A total of 12 healthy volunteers were recruited for the study. Subjects were studied and instrumented to record MAP during every procedure. Subjects squeezed a handgrip at 30% MVC while a gel pack with temperatures of 2 C was wrapped around their forearm. The three treatment conditions were 1) cold pressor, 2) handgrip, 3) both cold pressor and handgrip. Data were collected before and during each treatment condition. **Results:** Cold pressor stimuli did significantly alter mean arterial pressure in 10 out of 12 subjects. Change in mean arterial pressure during cold pressor was significantly different than change in MAP during handgrip and both treatments combined. There was no	**Walker A,** **Pacchia N,** **Cain S,** **Raven J,** **Smith M**

25	significant difference in MAP between the three treatment conditions. **Conclusion:** Applying gel pack to the forearm is an effective method to elicit a MAP response in normal resting humans. Pain stimulus created a greater MAP response when compared to the metaboreflex and both combined.	
EFFECT OF SMU 1281 GENE MUTATION ON MUTACIN PRODUCTION BY STREPTOCOCCUS MUTANS BACTERIA **26**	*Streptococcus mutans* is a Gram-positive anaerobic bacteria residing in biofilm of the oral cavity which has the potential to lead to tooth decay or cavities. Mutacin I is a peptide antibiotic produced by *S. mutans* that is known to be lethal to most other gram-positive bacteria in the mouth. Mutacin I production is stringently regulated by many genetic factors, one of which is a gene called smu1281. Smu1281 encodes a protein with unknown function. Our objective was to knock-out smu1281 and other surrounding genes to determine their effect on mutacin I production as well as on other cellular functions of *S. mutans*. Partial and complete deletion of 1281 gene from gene sequence was performed via single-crossover and double-crossover insertional mutagenesis, respectively. Furthermore, SMu 1278 through SMu 1281 were deleted to determine whether this region is involved in mutacin I production. Based upon previous studies and experiments, SMu 1278-1281 do contribute to the ability of *S. mutans* bacteria to produce mutacin. Therefore, we expect that the removal of these genes will in fact reduce mutacin production levels of this bacterium. Since the production of mutacin provides S. mutans with competitive advantage over other Gram-positive bacteria in the oral cavity, we expect that reducing the production levels of mutacin will render S. mutans less competitive in the biofilm.	**Braggs, Kirk*** **Dr. Z. Zhang,** **Dr. I. Huang,** **Dr. F. Qi;** **Department of Oral Biology, University of Oklahoma Health Sciences Center; Oklahoma City OK** **Department of Chemistry, Langston University**
EFFECTS OF TREATMENT WITH VITAMINS C AND E ON HEPATIC AND RENAL BIOTRANSFORMATION IN DIABETIC RATS **27**	Diabetes is a disease that is characterized by the body's inability to produce sufficient insulin to maintain normal glucose levels in the blood. Diabetes has many known effects such as nephropathy, retinopathy, neuropathy, and cardiovascular complications, many of which stem from oxidative stress. Oxidative stress has been proven to result from many factors such as free radicals, whose disruption of metabolic activities causes a disturbance of normal cellular activity. This study sought to show the effects of the antioxidant vitamins C and E on hepatic and renal detoxification in normal and diabetic rats. We hypothesized that the treatment of rats with vitamins C and E would reverse some of the complications associated with diabetes. The results of this study suggest that treatment with vitamins C and E is beneficial in the normalization of cytochrome P450 enzymes in the liver, though there seem to be no effects in kidney.	**Nichols, Shabree*** **Dr. Ruth Sanders,** **Dr. John B. Watkins III,** **School of Medicine, Indiana University, Bloomington, IN** **Langston University, Langston, OK**
EFFECTS OF UPPER CERVICAL SPINAL STIMULATION ON CARDIOVASCULAR RESPONSE TO ESPOHAGEAL DISTENSION	The cardiovascular system is regulated by specific nuclei in the brain stem. These nuclei control sympathetic efferent outflow to the heart and blood vessels. Previous work has also shown that C1-C2 spinal segments may modulate the sympathetic nervous system. This study was designed to determine if stimulation of C1-C2 with glutamate can stabilize the cardiovascular responses to noxious stimulation of the esophagus. Rats were anesthetized with sodium pentobarbital 60mg/kg). The C1-C2 dorsal segments were exposed and the dura mater and arachnoid membrane were removed. Thoracic noxious esophageal distension (ED, 0.4ml, 20s) was applied before, during, and after the C1 and C2 spinal neurons were chemically stimulated with a glutamate pledget (1.0M, 1min). Blood pressure and heart rate were recorded and analyzed. Our initial experiments suggest that the cardiovascular response to esophageal distension was suppressed	**Doss, Argenia*** **A. Barker, (?)** **Dr. J. Farber,** **Dr. C. Qin,** **Dr. R. Foreman:** **Department of Physiology, University of Oklahoma Health Sciences Center, Oklahoma City, OK** **Langston University, Langston, OK**

28	when glutamate was applied to C1-C2. This led to the conclusion that C1-C2 played a role in the modulation of the cardiovascular response to esophageal distension. Thus, C1-C2 may be a future area of study to understand the impaired regulation of the cardiovascular system in patients with spinal cord injury.	
ELECTRO-OPTICAL PROPERTIES OF FRACTIONATED SEMICONDUCTOR ZINC OXIDE NANORODS **29**	One-dimensional zinc oxide nanorods absorb UV light, are photoluminescent and are potentially important in a number of electro-optical applications. The objective of the research was to determine if the electro-optical properties of zinc oxide nanorods are a function of length. In order to proceed, the nanorods are separated into narrow length distributions using rate zonal centrifugation to fractionate the nanorods. After the fractionated nanorods were harvested, the photoluminescence of the fractionated samples were studied. It was concluded that the electro-optical properties were not a function of size in the length range that was fractionated.	**Harvey, Desmond*** **Dr. E. Samulski, University of North Carolina at Chapel Hill, Chapel Hill NC** **Department of Chemistry Langston University Langston OK**
ENCODING AND DECODING MODULAR CODES **30**	In computers, encoding is the process of putting a sequence of characters (letters, numbers, punctuation, and certain symbols) into a specialized format for efficient transmission or storage. Decoding is the opposite process -- the conversion of an encoded format back into the original sequence of characters. Encoding and decoding are used in data communications, networking, and storage. The code used by most computers for text files is known as ASCII (American Standard Code for Information Interchange, pronounced ASK-ee). ASCII can depict uppercase and lowercase alphabetic characters, numerals, punctuation marks, and common symbols. Other commonly-used codes include Unicode, BinHex, Uuencode, and MIME. In data communications, Manchester encoding is a special form of encoding in which the binary digits (bits) represent the transitions between high and low logic states. The terms encoding and decoding are often used in reference to the processes of analog-to-digital conversion and digital-to-analog conversion. In this sense, these terms can apply to any form of data, including text, images, audio, video, multimedia, computer programs, or signals in sensors, telemetry, and control systems. Encoding should not be confused with encryption, a process in which data is deliberately altered so as to conceal its content. Encryption can be done without changing the particular code that the content is in, and encoding can be done without deliberately concealing the content.	**Osei, Richard*** **Dr. Andrew Bucki; Department of Mathematics, Langston University Langston, OK**
EXPLORING THE TRAVELING SALESMAN PROBLEM AND INVESTIGATING NEURAL NETWORKS. **31**	First we will explore the traveling salesman problem in general, then we will examine the exhaustive search method in detail. Our next objective is to explain the nearest neighbor approach to solving the traveling salesman problem. We created a computer program using this method to solve the traveling salesman problem. To begin with, we will explain the pseudocode which is the first step in creating the program. Next we will insert a hardcopy of the program written in the Maple computer language with an explanation of how the program works including in it. The methods mentioned above have been used to approach the traveling salesman problem. Secondly, we will give a general overview of neural networks clarifying two of the four types. The adaline neural network will be the first technique investigated with explanations of the weight matrices and the delta rule. A hardcopy of the adaline numbers programs again using Maple will be inserted into the report. An explanation of the program will be included. Finally, we will investigate the back propagation neural network technique.	**Jungermann, Angie*** **Dr. Reza Pourdavood. Haja Radder, (?)** **Department of Mathematics, Langston University, Langston, OK**

EXPRESSION ANALYSIS OF STRESS RESPONSIVE GENES OF ARABIDOPSIS THALIANA **32**	The Arabidopsis Mutator (MutT) domain containing gene (At4g12720) and a gene encoding a RNA binding protein (At1g11650) were previously identified by microarrays to be significantly up regulated in response to environmental stresses. We confirmed induction of these two genes by northern blots containing RNA from ozone-treated plants and plants infected with Pseudomonas syringae, a bacterial pathogen. The MutT domain containing proteins are involved in scavenging oxidized nucleotides from the nucleotide pool and thus are important for preventing mutations in DNA that can be lethal. RNA binding proteins are important cellular regulatory proteins also reported to be involved in oxidative stress. These two genes belong to a multi-gene family in Arabidopsis. We designed gene-specific primers and amplified five gene family members of the MuT gene (At2g04430, At2g04450, At4g25434, At5g47240 and At5g47650) and RNA binding protein (At1g47500, At1g49600, At3g19130, At4g27000 and At5g19350) using reverse transcription PCR (RT-PCR). The RT-PCR products were cloned into pGEM-T easy vector. The clones containing the right-sized inserts were amplified by PCR using gene-specific primers to generate probe DNA for northern hybridizations. Blots containing RNA from plants subjected to ozone treatment and/or avirulent bacterial infections were prepared. Northern analysis of members of the two gene families indicates differential expression in response to biotic and abiotic stress**.**	**Buford, Joe Day-Von*** **Dr. S. K. Gunjan, Dr. N. Jambunathan, Dr. R. Mahalingam: Department of Biochemistry and Molecular Biology, Oklahoma State University, Stillwater, OK** **Langston University, Langston, OK**
EXPRESSION OF AND MEASUREMENT OF THE BINDING AFFINITY OF ISOTOPICALLY-LABELED CDC42 WILD TYPE AND CDC42(F28L) WITH A MINIMAL BINDING DOMAIN PEPTIDE OF A P21-ACTIVATED SERINE/THREONINE KINASE **33**	Cdc42 (cell division cycle 42) belongs to the Rho subfamily of the Ras superfamily of G proteins (guanine nucleotide binding proteins). The ultimate goal of this research is to study the solution structure of an oncogenic mutant of Cdc42, Cdc42(F28L), bound to an important effector peptide that regulates Cdc42-induced cell signaling activity using NMR Spectrometry. Both wild type and mutant Cdc42 were expressed using an Escherichia coli expression system, and purified using immobilized metal affinity chromatograph (IMAC). The binding affinity of wild type and mutant was tested by performing a protein pull down assay with PBD46, a minimal binding domain peptide of 46 amino acids of PAK (p21- activated serine/threonine kinases). The results showed that both the Cdc42 and Cdc42(F28L) were both successfully expressed in the minimal media containing the isotopic label, ^{15}N-Nitrogen, which is necessary for NMR studies. Pull down assays were performed to determine whether the presence of the ^{15}N-isotopic label affected binding of the PBD46 peptide.	**Blythe, Karole*** **Dr. Paul Adams, Department of Biochemistry/Chemistry at the University of Arkansas. Fayetteville, AR** **Langston University, Langston, OK**
EXPRESSION OF MICROTUBULE-ASSOCIATED PROTEIN, TAU, IN PC12 CELLS	Alzheimer's Disease is a neurodegenerative disease which causes massive cell death (apoptosis) to the frontal region of the brain. The cell deaths are caused by tau proteins detaching from microtubules and binding to other tau molecules. To imitate the effected frontal nerve cell, PC12 cells are used. In this experiment, the exogenous expression of the microtubule-associated protein, tau, will be investigated by using a Tet-off system, along with cell viability. By using PC12 cells in a Tet-off cell line, we can demonstrate how much tau protein is expressed in an actual frontal neuronal cell, and how a Tet-off cell line can express the amounts of tau produced in the presence and absence of Tetracycline. The reason for using the Tet-off cell line is to see how well it works for tau expression by introducing a foreign linearized plasimid (Tre-tight tau Midi) in which our gene of interest (tau) was incorporated. This is done by growing and treating	**Washington, Aaron S.*** **Dr. Chris T. Gamblin, Dr. Jay Starky,** **Department of Molecular Bioscience Kansas University, Kansas City KS** **Langston University, Langston, OK**

34	the cells, then transfecting the linearized plasmid into the PC12 cells. Tetracycline is added to one well of each set of wells, and their tau proteins are harvested to be used in a western blot to verify the different amounts of tau produced by the cells in each well. Because the amounts of tau produced varied (on the western blot), the Tet-off cell line may accurately be used to show the expression of microtubule-associated protein (tau) in PC12 cells with minimal cell death (apoptosis).	
FIRST PRINCIPLES CALCULATIONS OF DNA DISPERSAL OF CARBON NANOTUBES **35**	**Purpose:** The purpose of my research is to predict the best sequence of single DNA strands to recognize and wrap around the most common carbon nanotube (the 10,10), to form a unique structure and to use these results to develop rules that can allow one to estimate the best sequences for other sizes of nanotubes. **Analysis:** PolyA, PolyC, PolyT, PolyG, and PolyGT DNA single strands were used to examine their interaction with the carbon nanotube. Namot2, in conjunction with xleap, was used to create a 10 base long sequence of the various versions (straight, wrapped, and mixed) of each DNA single strand; VMD was used to align each of them to the nanotube. The created systems were then annealed in a vacuum and, the best structure for each annealing process was isolated for full molecular dynamics. **Conclusion:** In the remaining weeks, I hope to stem at the fundamental nature of the interaction between the nanotube and each DNA single strand. This summer's activities have provided an essential foundation upon which future simulation will be based.	**Hawkins, Calvin*** **Dr. William A. Goddard III,** **Tod A. Pascal,** **Materials and Process Simulation Center,** **Chemistry and Chemical Engineering Division,** **California Institute of Technology, Pasadena, CA**
FLUORESCENT IMAGING IN TRABECULAR MESHWORK CELLS: A MODEL SYSTEM TO EVALUATE GLUCOCORTICOID-INDUCED PHAGOCYTOSIS	To date millions of people worldwide have been diagnosed with glaucoma, the most common type being open-angle. Open-angle glaucoma occurs when the outflow pathway, which enables the aqueous humor to drain properly, is severely limited. The build up of pressure due to the lack of drainage causes the normal intraocular pressure to be elevated leading to damage of the optic nerve head and thus eventually leads to total vision loss. Glucocorticoids can exacerbate the effects of open-angle glaucoma by increasing the intraocular pressure. Glucocorticoids alter the ability of trabecular meshwork (TM) cells to phagocytose extracellular material and thus can increase the resistance to aqueous humor outflow. Glucocorticoids change the expression of a number of genes in TM cells and alter their performance. Dexamethasone (DEX) is a type of glucocorticoid that has been shown to inhibit the ability of trabecular meshwork cells to phagocytose. Thus, our hypothesis is that cultured cells from glaucoma patients and from patients without glaucoma treated with DEX would ingest less beads then untreated cells. Four assays were conducted on two lines of cells tTM3 and tTM5. The two cell lines were derived from a patient with glaucoma and without glaucoma respectively. Florescent green beads were used to track the abilities of the cells to phagocytose. Cells were treated for twenty-four hours in the presence of DEX (100nM) then incubated with beads for one hour. After cells were incubated with beads they would be fixed and incubated with goat anti-rabbit IgG 633 (red) dye to differentiate intracellular from extracellular beads. DAPI (6'4-Diamidino-2Phenylindole) was used to calculate how many beads per one hundred cells were phagocytosed. A confocal microscope was used to show the different colors of the dyes and photographic images were used for documentation and review. The data collected showed that when tTM3 and tTM5 cells were treated with DEX they both ingested less beads. Ultimately, tTM3 cells were more sensitive to the DEX	**Ognibene, Cherie M. *** **Dr. Thomas Yorio,** **Dr. Xinu Zhang.** **University of North Texas Health Science Center, Fort Worth, TX** **Langston University, Langston, OK**

36	treatment then tTM5 cells. The NIH grant number 2T35HL007786-13 supported this abstract.	
GENOTYPE AND GROWTH REGULATOR DEPENDENCY IN PEANUT EMERGENCE SHOOT DETERMINATION **37**	Cell shoot-determination is a primary step in the shoot regeneration process. It generally involves early gene activation without conspicuous morphological changes. Related gene activation is generally induced by growth regulators included into the culture medium. The main goal of this study was to assess the incubation period required for exposing peanut naturally on peanut plantlets. Partial results show that cell shoot-determination in peanut is both genotype and growth regulator dependent. Of the growth regulators used (2, 4-D, kinetin, and thiadiazuron), thidiazuron induced more shoots than any other growth regulators.	**Ross, Kariel*** **Dr. Kanyand Matand** **Dr. Ning Wu,** **Department of Biology, School of Arts and Sciences;** **Center for Biotechnology research and Education, School of Agriculture and Applied Science, Langston University; Langston, OK**
GLOBAL ANALYSIS OF MUON DECAY MEASUREMENTS DOI: 10.1103/PHYSREVD.72,073002 CONVERSION OF DYNAMIC EXPLORER HAPI/LAPI DATA TO CDF'S FOR ARCHIVING AND EASY DATA BROWSING ANALYSIS **38**	The Dynamic Explorer (DE) program consisted of two satellites, the DE-1 and DE-2. They were launched together on Aug 3, 1981 to study the coupling of energy, electric currents, electric fields, and plasmas between the magnetosphere, ionosphere, and the atmosphere. The DE-1 satellite was placed in a highly elliptical orbit having an apogee of 4.65 Earth radii (6378 km per Earth radius) and a perigee altitude of 675 km, whereas DE-2 had a nearly circular orbit with a required perigee to be below 350 km and a apogee above 1000 km. For my project I will be focusing on refurbishing the data from the High Altitude Plasma Instrument (HAPI) on DE-1 and the Low Altitude Plasma Instrument (LAPI) on DE-2, so that they can be accessed and used by modern data accessing tools. Converting the data to a Common Data Format (CDF) will be helpful in building generic software on that data. This allows scientists to view trends or events in different data sets. The SKTEditor, a CDF tool developed by the Space Physics Data Facility (SPDF), is used to develop the initial empty CDF with metadata. The programming language, IDL, is used to convert the HAPI and LAPI data and store into CDF's that will be used by the SPDF data browsing system, CDAWeb. In conclusion the HAPI and LAPI data was raw data that was very hard to use due to the fact that it was not readable, but by converting the data to a CDF will enable scientists to have a much wider usage. The conversion will also be easy for multi-instrument data analysis by adding to CDAWeb's holding.	**Brison, Shanequah*** **Dr. Shing Fung and Robert M. Candey, NASA Goddard Space Flight Center, Code 612.4-Space Physics Data, Greenbelt, MD** **Computer Science Department, Langston University, Langston, OK,**
GLUCOSE MEASUREMENT BASED ON FÖSTER RESONANCE ENERGY TRANSFER BETWEEN CONCANAVALIN A-FLUORESCEIN ISOTHIOCYANATE AND DEXTRAN/GOLD NANOPARTICLES	Diabetes affects approximately16 million people in the United States and over 100 million people worldwide. Numerous diabetics prefer a painless method to measure their blood glucose levels in order to manage the fluctuation of their levels more effectively. The goal of the experiment is to develop a new glucose sensor that will act effectively with the fluorescent light in order to be sensed through the tissue after excitation from an internal or external source by the Föster resonance energy transfer (FRET). If the goal is accomplished there will be a great possibility to develop biocompatible materials for assay encapsulation. If results are sufficient, the ideas of implantable glucose-sensitive microspheres will be more feasible. During experimentation, the concentrations of the dextran, gold nanoparticles, and ConcanavalinA-Fluorescein Isothiocyanate (Con A-FITC) solutions were established and several tests were run to ensure accurate results. The results proved that the .6 µM of ConA-FITC at the fluorescence intensity at 520 nm would be most effective when testing because the concentration is neither too high nor low and	**Ekpo, Felicia*** **Dr. Jared Garret,** **Dr. Kaiming Ye** **Department of Biology, School of Engineering, Department of Biomedical Engineering, University of Arkansas, 700 Research Center Blvd., Fayetteville, AR** **Langston University, Langston, OK,**

39	demonstrated that the effects were consistent with the Föster Resonance Energy Transfer.	
HEART RATE VARIABILITY IN INSULIN RESISTANCE DOG MODEL; EARLY INDICATOR OF AUTONOMIC DYSFUNCTION OF CARDIO METABOLIC SYNDROM **40**	**Introduction:** Physiologically the cardiometabolic syndrome provokes a decrease in the autonomic nervous system control of respiratory sinus arrhythmia in insulin resistant dogs. The sympathetic nerves increase heart rate, whereas the parasympathetic (vagus) nerves slow heart rate. The influence of parasympathetic innervations can be evaluated by analyzing the heart rate variability through the use of power spectral analysis (PSA). When vagal influences are strong, the high frequency power increases. **Hypothesis:** We hypothesize that the high frequency power of fat-fed, insulin resistant dogs will be significantly lower compared to the baseline time measurements and to lean controls. **Methods:** The dogs in this study were fed a high fat hyper caloric diet for 6 weeks, and changes in the body mass, blood glucose and insulin sensitivity were monitored. The high fat diet was reported to produce a diet-induced insulin resistance and hyperinsulemia. **Results:** The heart rate increased from week 0 to week 6 in 4 of 6 of the fat-fed, insulin resistant dogs and was largely unchanged in the control dogs. Likewise, the average high frequency power in the insulin resistant dogs decreased significantly in 4 of 6 animals and was unchanged in controls. **Conclusion:** We conclude that the changes in heart rate consequent to fat feeding are the result of changes in parasympathetic influence as evident from parallel changes in the high frequency power in the insulin resistant dogs. The dog model will thus be helped for the study of early diet-induced alterations in parasympathetic activity and cardiometabolic function prior to the development of obesity and diabetes.	**Watson, Detrick R.*** **Dr. Matthew A. Barlow, Dr. James L. Caffery, Dept. Of Integrative Physiology, University of North Texas Health Science Center at Fort Worth, Fort Worth TX** **Langston University, Langston, OK,**
INFORMATICS TO IMPROVE CLINICAL BRAIN MAGNETIC RESONANCE SPECTROSCOPY **41**	**Objective:** Magnetic Resonance Spectroscopy (MRS) Imaging is a clinical imaging technique that radiologists use to gain information about biological chemicals in the body, in this case the brain. In this particular project, MRS images from brain cancer patients were collected from several research papers for an informatics meta-analysis; furthermore, from these sources, a Meta-analysis will be conducted for brain tumors. The primary goal of this project was to standardize information from different sources and to provide standardized information to differentiate between different glioma grades. **Methods:** Our lab has developed specialized software to extract metabolite information from several MRS images. We used specialized informatics software designed in the lab to go through all of the relevant articles, which are available in PubMed, to extract metabolite information from several MRS images in goal to create standardized information to many different types of brain tumors. **Result:** Informatics Methodology provides better information for clinicians to evaluate our clinical MRS exams. **Conclusions:** We created Confidence intervals for Brain Glioma MRS Data. This information was useful in improving our clinical services as it was able to provide us with the baseline expectations from the literature which will help us compare our results with these baselines.	**Caldwell, Kenta*** **D. H. Wu, Ph.D., Department of Radiological Sciences, University of Oklahoma Health Sciences Center; Oklahoma City, OK** **Department of Chemistry Langston University, Langston, OK**
INTERMITTENT HYPOXIA CONDITIONING PROTECTS AGAINST	We hypothesized that intermittent hypoxia conditioning (IHC) protects against toxic effects of ethanol withdrawal (EW) on brain mitochondria. This hypothesis is based on previous findings that IHC protects against the cardiovascular disorder and EW perturbs	**Atkinson, Brittanie*** **Dr. JW Simpkins, Fr. R. Mallet,**

OXIDATIVE DAMAGE TO BRAIN MITOCHONDRIA IN ETHANOL WITHDRAWN RATS **42**	mitochondria integrity. Young adult ovariectomized rats with or without 17β-estradiol replacement received a 5 week-control dextrin or ethanol diet (6.5%). Twenty days prior to the end of the diet, rats received IHC such as a 10 minute-hypoxia (9 -10% of O_2) followed by a 4 minute-normaxia, repeating 5 or 7 times a day until they were sacrificed. Twenty-four hours after termination of the ethanol diet, rats were tested for physical signs of EW and immediately sacrificed. Mitochondria from the cerebella were processed to assess the levels of carbonyls and malondialdehyde as indicators of protein oxidation and lipid peroxidation, respectively. Functional damage to mitochondria was assessed by measuring the activity of an essential mitochondrial enzyme cytochrome C oxidase and mitochondrial permeability transition pore of which excess pore opening dysregulates the passage of specific molecules across the mitochondrial membrane. While EW rats without IHC showed severe EW signs, rats with IHC showed no EW signs. Compared to EW rats without IHC, EW rats with IHC showed significantly lower levels of protein carbonyls, lower levels of malondialdehyde, a higher activity of cytochrome C oxidase, and less mitochondrial permeability transition pore opening. 17β-estradiol replacement increased the effects of IHC on these parameters. These results suggest that IHC counteracts against EW-induced oxidative and functional damage to brain mitochondria of female rats in a manner that is more effective in the presence of estrogen.	**Dr. F. Downey** **Dr. A. Wilson** **Dr. ME Jung** **University of North Texas Health Science Center at Fort Worth; Fort Worth TX** **Langston University, Langston, OK**
ISOLATION AND PARTIAL IDENTIFICATION OF STREPTOMYCIN RESISTANT GRAM POSITIVE BACTERIA OBTAINED FROM SOIL **43**	Gram-positive microorganisms were isolated from soil by serial dilution at 37°C. After several passages of growth at 37°C 15 organisms demonstrated the continued capability to grow in the presence of streptomycin. Identification of the organisms ensued based on the gram reaction and their ability to grow and ferment glucose. Organisms were placed into one of two groups, those that fermented glucose and those that failed to ferment glucose. These microbes underwent further identification based on information obtained from standard data. Biochemical experiments used to finalize the organism's binomial system of nomenclature were: reduction of phenylalanine, hydrolysis of casein growth in anaerobic agar, and growth in Sabouraud dextrose.	**Hughes, C.*** **C. Quick,** **A. Sanders,** **W. Baker, Jr.,** **Department of Biology, Langston University, Langston, OK**
LARGE-SCALE EXPRESSION AND PURIFICATION OF GST-CAVEOLIN FUSION PROTEINS **44**	Caveolin- I is the major protein component of specialized lipid rafts called caveolae. Caveolin-I has been previously shown to associate with the photoreceptor G-protein alpha subunit, transducin alpha (Tα). A goal of this study is to understand how this interaction influences Tα function. To do this, we expressed and purified full-length Caveolin-1 (GST-CAV-FL, amino acid residues 1-178) and Caveolin-1 deletion mutants (residues 1-140, 1-81, 61-101, 102-134, and 135-178) fused to Glutathione-S- Transferase (GST) for use in functional assays of Tα. The DNA encoding each protein was inserted into an Isopropyl-p-D-Thiogalactoside (IPTG)- inducible vector for expression in *E.Coli*. The expressed fusion proteins were purified on glutathione-sepharose beads and eluted with IOMM glutathione elution buffer. Expression and purification was assessed by SDS-PAGE and immunoblot analysis. All fusion proteins were successfully expressed and purified. However, the ability to elute the proteins from the glutathione-sepharose beads varied for each protein. No detectable GST-CAV-FL could be eluted. These results indicate that Caveolin-I fusion proteins can be expressed and purified in large quantities but recovery by glutathione elution may depend on the structure of Caveolin-1. This work was supported by grants from the National Institutes of Health.	**Carroll, DL*** **Dr. M. H. Elliot,** **Dr. R. E. Anderson,** **Dean McGee Eye Institute, University of Oklahoma Health Sciences Center, Oklahoma City, OK** **Dept. of Chemistry and Physical Sciences, Langston University, Langston, OK**

LAYER-SPECIFIC GLYCOSAMINOGLYCAN CONTENT AND MECHANOBIOLOGY OF THE AORTIC VALVE **45**	The aortic valve is paramount to the ability of the heart to pump blood to the rest of the body. During ventricular systole, pressure rises in the left ventricle. Once the pressure in left ventricle has risen above the pressure in the aorta the aortic valve opens allowing blood to exit the left ventricle and flow into the aorta. This process also closes the aortic valve. The aortic valve exists as a tricuspid valve meaning there are three valves, the right, left, and non-coronary valves. Each of these valves can be split up into three layers, fibrosa, spongiosa, and ventricularis. Until recently, it was widely believed that tissue engineering a heart valve could be done by examining the leaflets as a whole. This research intends to investigate the valve leaflets by their three layers. Particularly close attention will be paid to the fibrosa and ventricularis layers because the spongiosa layer is difficult to extract. The ventricularis layer is known for its elasticity while fibrosa is known for its strength. Glycosaminoglycans (GAGs) can be covalently linked to a protein to form proteoglycans (PGs). Using this knowledge an inference can be made as to which PGs comprise each valve layer. Once a quantitative analysis of the GAGs and subsequent PGs in each layer is complete inferences about the mechanobiology of the proteoglycans in each layer can be made. To do this a technique known as Fluorophore Assisted Carbohydrate Electrophoresis (FACE) will be implemented.	**Henderson, Alex*** **Hubert Tseng,** **Dr. K Jane Grande-Allen** **Rice University,** **Department of Bioengineering, Houston, TX** **Department of Chemistry,** **Langston University,** **Langston, OK**
LIGAND INVESTIGATION **46**	There have been many studies of ligands, small molecules that bind to protein molecules. Although the identification of ligand structures has been performed for many years and over 8,800 structures have been deposited in databases, there are ligands that are variants of the same structures. The goal of this research is to create a list of the top 200 most commonly used ligands. This list can benefit crystallographers who study protein crystals and may have a ligand in their protein. Knowing that a specific ligand is contained in the x-ray diffraction data will be significant to the crystallographer's research. This new list will cover over sixty percent of ligand entries and will increase the probability of finding ligands.	**Wright, Jamie*** **Dr. Nigel Moriarty,** **Dr. Paul Adams,** **Physical Biosciences Division, Lawrence Berkeley National Laboratory, Berkeley CA** **Department of Chemistry,** **Langston University,** **Langston OK**
LIMITS ON MUON DECAY FROM RECENT MEASUREMENTS **47**	All measurements of muon decay are successfully described by the "V-A interaction". Each measurement is a parameter with its own experimental value. There are nine parameters, which are: ρ, δ, $\xi\delta/\rho$, ξ', ξ'', α/A, β/A, α'/A, β'/A. These parameters describe the momentum spectrum, asymmetry, and the longitudinal/transverse polarization of electrons emitted in muon decay. The muon decay interaction may be written as a local, derivative – free, lepton – number – conserving, four fermion interaction. My project consists of writing a computer program, based on the language of C++, to calculate new limits on this general interaction based on the new measurements that have been performed at PSI and TRIUMF, and added in the last half year. This program will incorporate the nine muon decay parameters, the new re-measured values for some of the parameters, the new correlation of the parameters and the original constraints which the measurements must follow.	**Williams , Nathan J.*** **Dr. Carl Gagliardi** ***(TAMU Cyclotron Inst.)*[1]** **Texas A&M University Cyclotron Institute, College Station TX** **Langston University** **Langston Oklahoma**
LINEAR TRANSFORMATION ON HILBERT SPACE	The mathematical concept of a *Hilbert space*, named after the German mathematician David Hilbert, generalizes the notion of Euclidean space in a way that extends methods of vector algebra from the two-dimensional plane and three-dimensional space to infinite-	**Martin, David*** **Dr. Justin Peters,** **Department of**

48	dimensional spaces. Hilbert spaces arise naturally and frequently in mathematics, physics, and engineering typically as infinite-dimensional function spaces. Geometric intuition plays an important role in many aspects of Hilbert space theory. This project examined the geometrical structure of linear systems in finite dimensional spaces. In particular metric spaces, balls of metrics, norms, balls of norms, and the construction of norms in R^2 were examined.	**Mathematics, University of Iowa, Iowa City, IA** **Department of Mathematics Langston University, Langston OK**
MASTITIS: A CONDITION THAT AFFECTS THE SENSORY NERVOUS SYSTEM **49**	Mastitis is caused by the penetration of the mammary gland by pathogenic bacteria through the teat duct. This results in the teat and udder becoming hot, inflamed, swollen, or hard. The severity can range from a notably sick goat to a mild form with only slightly abnormal milk. This infection also attacks the sensory nervous system. The intercostal nerves provide the innervation to the mammary gland. The intercostal nerves give off lateral and anterior cutaneous branches and muscular branches. The purpose of this study is to analyze the sensory innervation to the mammary gland and to investigate projections from the hypothalamus. Female Alpine goats were used for this study. Prior to the initiation of the study, goats were tested for the detection of mastitis. A bacterial challenge model was employed to ensure control over the intramammary infection and extend a greater ability to follow the course of the infection. Mammary gland tissue was dissected away from the pectoral region. Hypothalamo-neurohypophyseal pathways were reviewed. The paraventricular nucleus containing oxytocinergic neurons secreting oxytocin directly to the neurohypophysis via the neurohypophyseal tract. The suckling response causes the release of oxytocin, oxytocin acts on muscle to contract and milk is released, but during mastitis the infection prohibits milk letdown and affects sensory nerve innervation. Mastitis has been a longtime opponent of the dairy industry. It has cost the industry millions of dollars in terms of drugs, veterinary cost, and lost milk production. It has been known to infect a large number of mammals including rats, mice, humans, and the subject of our study, goats. Overall, this condition can result in discomfort such as pain, redness, and inflammation of the infected area and the sensory nervous system.	**Rider, Teremun*** **Dr. Sonya J. Williams, Dept. of Biology and Physical Therapy, Langston University, Langston, OK**
MEASUREMENTS OF THE RATE CONSTANT FOR THE REACTION OF OH RADICALS WITH HYDROXYACETONE **50**	In order to understand the formation of photochemical smog in the atmosphere, rate constants for several reactions with hydroxyl radicals and various volatile organic compounds are measured. Ozone is a key component of Photochemical Smog and is considered to be a pollutant when found in the troposphere which is the lowest layer of the atmosphere; in fact, high levels of ozone in the troposphere can result in health complications. In this particular experiment the rate constant for the OH + Hydroxyacetone reaction was measured. By using flow tube techniques with resonance fluorescence detection, measurements of the rate constant for the OH + Hydroxyacetone reaction agreed well with results from previous studies. The result is an average rate constant of $(3.1 \pm 0.39) * 10^{-12} cm^3 molecules^{-1} s^{-1}$ at a temperature of 318K and pressure of 5torr.	**Caldwell, Kenta*** **Dr. Philip Stevens, Department of Chemistry University of Indiana-Bloomington; Bloomington IN** **Langston University Langston, OK**
MITES IN POA ARACHNIFERA	*Poa arachnifera* (bluegrass) is a cool seasonal, perennial grass with a polypoid genome typically consisting of n=7=56 to 84 chromosomes. Little is known about the genomic composition or relationship of the *Poa* genus and few molecular markers have been generated. Recently, researchers with the USDA, Logan, UT examined genome	**Harrison, Jamie L.*** **Dr. Sharon Lewis, Dr. John Coleman Department of Chemistry Langston University**

51	relationships and history of polyploidy evolution among twenty-two *Poa* species. The results suggest that the genus consists of overlapping species relationships of which *Poa arachnifera* fell within four distinct groups of the phylogenetic tree. As a consequence, this species may represent an ancient *Poa* species and may be an ideal source for the derivation of genomic information and *Poa* ssp. molecular markers. The purpose of this study was to identify transposable elements in *Poa arachnifera* contained in 300 nucleotide sequences obtained from USDA. There are over 100,000 MITEs in the rice genome representing some 6% of the total genome. Some of the mutations found in certain strains of rice are caused by insertion of MITEs in the gene. The interns in the Chemistry Department at Langston University identified a total of 21 MITEs, including: Castaway, Ditto, Gaijin/Gaigin, ID – 3, adh type G & B, pangrangja, and Tourist – like. In addition, the interns identified 17 molecular markers for *Bromus inermus* (smooth brome grass). including: Castaway, Ditto, Gaijin/Gaigin, ID – 3, adh type G & B, pangrangja, and Tourist – like.	**Langston OK**
MONITORING THE FORMATION OF INCLUSION BODIES DURING OVEREXPRESSION OF INTERLEUKIN 1A IN ESCHERICHIA COLI **52**	This study is aimed at understanding the overexpression of interleukin-1α (IL-1 α), a cytokine, in Escherichia coli (E. coli). IL-1 α is overexpressed as inclusion bodies in E. coli. Alteration of the conditions of bacterial growth is found to share little effect on the overexpression of IL-1α. The inclusion bodies of IL-1α accumulate maximally 9 hours after initiation of bacterial growth. Mass spectroscopy data suggests that formation of inclusion bodies of IL-1α proceeds via coalescence of misfolded monomeric intermediate states. A novel Congo red based staining method has been developed to specifically detect the formation of inclusion bodies in bacterial cells.	**Loftis, Charles*** **School of Arts and Sciences, Langston University, Langston, OK**
OPTIMIZATION OF CRYSTALLOGRAPHIC HEME RESTRAINTS **53**	The process of x-ray protein crystallography is one of the widely used techniques used to solve protein structure. When x-rays are projected through a crystallized protein, diffraction patterns are created. The diffraction patterns can be converted into a 3-D model. In solving proteins the protein structure is positioned in electron density using complex algorithms. In some protein structures different components become distorted when placed inside electron density. Specifically, in hemoproteins there is puckering in the heme structure. This study looks at optimizing the geometry of hemes to fit accurately inside the electron density. To this end, a set of restraints has been constructed to optimize the geometry and chemical restraints of the heme structure. Tests performed on the heme structure have shown that the new restraints have decreased the difference maps sigma values, proving that the structure has a better fit inside the density.	**Kelly, Kamille*** **Dr. Nigel Moriarty, Dr. Paul Adams, Physical Biosciences Division, Lawrence Berkeley National Laboratory, Berkeley CA** **Department of Biology, Langston University, Langston OK 73050**
OPTIMIZING THE MECHANICAL PROPERTIES OF LAPONITE GEL	The study of Laponite clay and its properties is the focus of this presentation. Laponite is used in many products such as emulsions, make-up, nail varnishes, shampoos, toothpastes, and other household products (1). The reason we are testing this gel is to see how it compares to water in baby teethers. We wanted to test and see if replacing water with this Laponite gel would work better. We need to test various parameters of this gel such as, if it would stay cold longer than water. We also needed to test how long it took for the clay to become a gel from the time it is mixed with water to the time it is	**Terry, Danny*** **Dr. Victor Breedveld, Department of Chemical and Biomedical Engineering, Georgia Institute of Technology, Atlanta, GA**

54	fully gelled, for production purposes. Also, we needed to test the properties of the actual gel i.e. at what concentrations is the gel strong enough for production and the amount of time for the gel to recover after it has been destroyed or had outside stress applied to it. Most of these were tested in the rehometer.	**Department of Chemistry, Langston University, Langston, OK**
PERIPHERIN/RDS AND ROM-1 EXPRESSION AND INTERACTION IN CONE-DOMINANT RETINAS OF NRL-/- MICE **55**	Many inherited retinal degenerations are characterized by an initial period of rapid rod photoreceptor death followed up with cone dystrophy. Peripherin/rds (P/rds) and rom-1 are photoreceptor-specific proteins that are located in the rim region of the outer segment disc membranes of rods and cones. Mutations in this gene have been identified in varieties of human retinal diseases including autosomal dominant retinitis pigmentosa (rod defect) and macular dystrophy (cone defect) . An interaction of P/rds and rom-1 and the hetero- and homo- complex formation is critical for the protein function and integrity of photoreceptors. The transcription factor neural leucine zipper (Nrl) is essential for rod differentiation and plays a critical role in regulating gene expression. This study was designed to determine the expression of P/rds and rom-1 in cone-dominant retinas and to examine the interaction of P/rds with rom-1 and the complex formation in cones. The cone function of Nrl-/- mice, as manifested in light-adapted ERG, was significantly enhanced compared to wild type. Through western blot analysis, P/rds and rom-1 were present in Nrl-/- mice in reducing and non-reducing SDS-PAGE, suggest the presence of disulfide-linked dimers of P/rds and rom-1 cones. Immunoprecipitation showed the interaction between P/rds and rom-1 in the retinas of Nrl-/- mice. Further research should be done to determine the properties of P/rds and rom-1 complex formation in cone-dominant retinas and to explore the mechanism of mutations that induce cone dystrophy.	**Booker, Sheree*** **Dr. X. Ding,** **J. Skaggs,** **Dr. M. Naash:** **Department of Cell Biology, University of Oklahoma Health Sciences Center [2], Oklahoma City, OK** **Langston University, Langston, OK**
PROCESSING THE LUMBO-SACRAL SPINAL CORD OF THE RAT: A HISTOTECHNOLOGICAL APPROACH **56**	The rat spinal cord begins as an extension of the medulla at the base of the brain, and it extends posterior toward the coccyx. Previous studies have reviewed and examined the spinal cord in detail, in particular, the large motor neurons located in the ventral horn. For these reasons, we wanted to investigate the size of neurons in the lumbosacral spinal cord and correlate size to known functions. There were several techniques involved in examining the rat spinal cord. These techniques include removing the spinal cord by laminectomy and then sectioning it with the use of various histological instruments such as microtome, cryostat, and Vibratome. In these studies, the Vibratome was the basic histological instrument used. Use of the Vibratome is beneficial to the process because the sections do not need to be frozen in order to make slides of a quality to be used in data research. The rat spinal cords were removed by laminectomy, and placed into a 0.1M PBS solution. The following day, the lumbar segment was blocked and the pia mater removed. After the pia mater was removed, the spinal cord was sectioned at 40μm thickness, mounted onto subbed glass slides, and then cresyl stained. Laminae VII-IX were analyzed. Representative sections contained motor neurons in a range of sizes (1μm -7 μm). Studies reveal neurons in these laminae contain intermediate sized motor neurons involved in motor pathways and other clusters of somatic motor neurons, which innervate muscles performing simple voluntary movements.	**Harris, Victor*** **Dr. Sonya J. Williams, Dept. of Biology and Physical Therapy, Langston University, Langston, OK**

PRODUCTION OF RECOMBINANT MMTV CAPSID **57**	Mouse-Mammary Tumor Virus (MMTV) is a retro-virus that causes tumors to form in mice. There are three Open Reading Frames (ORF) in MMTV; they are *gag*, *pol*, and *env*. Each of these genes plays a role in the assembly of MMTV particle. *Gag* codes for major structural proteins such as matrix (MA), capsid (CA), and nucleocapsid (NC). MA forms the envelope and the CA is responsible for the formation of core. The purpose of the research was to make polyclonal antibodies against the CA-protein. A series of experiments were performed to isolate and purify the protein, which contained both Biotin-tag and His-tag at the C-terminus (respectively). (Biotin-tag is used for binding of the protein to streptavidin agarose, and His-tag facilitates the purification of protein by Ni-NTA affinity chromatography). The protein was purified under denaturing conditions (8 M Urea) as well as native conditions. Native conditions yielded purer protein. The protein was approximately 35% biotinylated according to the pilot experiments with streptavidin agarose. The total amount of purified obtained under native conditions was approximately 25 mg from two liters of medium. The protein was then bound to streptavidin agarose in large scale for the final experiment. Six milligrams of CA protein bound to streptavidin agarose sent be sent to Lampire Laboratories for immunization of rabbits.	**Hughes, Curtrina*** **Dr. Jan Snasel** **The University of Oklahoma Health and Sciences Center, (OUHSC) Oklahoma City OK** **Dr. Ales Zabransky,** **Dr. Mike Sakalian** **Dept. of Microbiology/Immunology** **The University of Oklahoma Health and Sciences Center (OUHSC) Oklahoma City OK** **Langston University, Langston, OK**
PURIFICATION OF BCL-2 EXPRESSEN IN ESCERICHIA COLI. **58**	The gene Bcl-2 was first discovered at the site of a translocation between chromosomes 14 and 18 in a human follicular lymphoma. Over expression of Bcl-2 specifically prevents cells from initiating programmed cell death in response to a number of stimuli. The expression system with an inducible promoter for controlling expression of the protein is used to prevent cell death toxicity of the recombinant protein. Expression of the recombinant protein is rapidly induced by the addition of isopropyl-B-D-thiogalactoside (IPTG), which binds to the repressor protein and inactivates it. Bcl-2 protein contains a stretch of hydrophobic residue near the carboxyl terminus that anchors it in intracellular membranes. These membrane locations have prompted speculations that Bcl-2 protein may be involved in some aspect of transport across membranes. Visible protein was purified using the mini and large-scale preparations. Therefore, it was concluded that Bcl-2DTM can form a channel across membranes and that it transports a significant amount of protein across these channels.	**McFalls, A.*** **Dr. D. Chan,** **Dr. R. Harkins,** **Langston University** **Langston OK** **J. L. Lin (?)** **Z. Zhang, (?)** **Department of Chemistry** **Department of Biochemistry & Biology, and Molecular Biology, University of Oklahoma Health Sciences Center, Oklahoma City, OK.**
RADIOLABELING LIPOSOMES WITH ^{99M}TC	**Objective:** Liposomes are a lipid-based drug delivery system and are used as a vehicle for a few clinically used anticancer and antifungal drugs. Knowing the distribution of liposomes after administration may be of interest to determine whether the drug has reached its intended destination in the body. Labeling liposomes with a gamma ray emitting radionuclide, coupled with non-invasive imaging can be particularly useful. Our objective was to prepare liposomes capable of being labeled with technetium-99m (Tc-99m). **Methods:** Our first goal was to synthesize a lipid that can chelate Tc-99m while structurally inside the lipid bilayer of liposomes. To this effect we synthesized, Distearoylphosphatadylethanolamine conjugated to 6-hydrazinonicotininate (DSPE- HYNIC). The compound was monitored by TLC. Next, we prepared liposome with distearoylphosphatidylcholine, DSPE-HYNIC, and cholesterol (1:0.07:1, molar ratio). The liposomes were allowed to react with Tc-99m as the pertechnetate, in the presence of stannous chloride reductant and tricine as a co-ligand. Labeling efficiency was monitored by gel exclusion chromatography with PD-10 column.	**Braggs, Kirk*** **Dr. V. Awasthi,** **Department of Pharmaceutical Sciences, University of Oklahoma College of Pharmacy, University of Oklahoma Health Sciences Center, Oklahoma City OK [1]** **Department of Chemistry, Langston University, Langston, OK**

59	**Results:** We could successfully synthesize the chelating lipid DSPEC-Hynic in high yields, 36%. The labeling efficiency of liposomes containing this lipid ranged from 10-35%. After PD-10 column purification the labeled product yielded >95% radioactivity associated with the liposomes. **Conclusion:** Liposomes can be successfully labeled with Tc-99m. More work needs to be performed for optimal conditions of labeling in order to obtain higher labeling efficiency. Future work will entail the use of this technique to follow in vivo distribution of labeled liposomes with gamma camera imaging.	
RECOMBINANT OPIUM POPPY SALUTARIDINE SYNTHASE AND SALUTARIDINOL ACETYLTRANSFERASE EXPRESSION IN PICHIA PASTORIS **60**	The morphine biosynthesis pathway has been under investigation for many years. Morphine is a commonly used analgesic drug that acts directly on the central nervous system. Salutaridine synthase and salutaridinol acetyltransferase are vital enzymes in the biosynthesis of morphine in opium poppy. Salutaridine synthase is an enzyme that is responsible for production of salutaridine, an alkaloid that is involved in the biosynthesis of morphine. Salutaridinol acetyltransferase is an enzyme responsible for the conversion of salutaridinol to salutaridinol-7-0-acetate, also in the biosynthetic pathway of morphine. In the present study we used *Pichia pastoris* as an expression system to determine if propagation of these specific genes could occur and functional proteins could be obtained from the cloned genes. With each enzyme, polymerase chain reactions were used to amplify specific DNA in our vector, pA0815. By performing phenol chloroform isoamyl alcohol extractions (P:C:I), ethanol precipitations, and gel extractions we were able to perform restriction digest with EcoRI on each PCR product and the vector. P:C:I and ethanol precipitation were then performed again before conducting Calf Intestinal Alkaline Phosphatase (C:I:A:P). A gel extraction was performed to remove all proteins from the gene insert, whereas P:C:I and ethanol precipitation were done on the vector. DNA ligation was then performed in preparation for transformation into *E. coli*. With our gene inside of pA0815, we transformed salutaridinol acetyltransferase and salutaridine synthase into *E. coli* and grew the bacteria on plates made up of LB with ampicillin. Only the ampicilin resistant colonies would grow, thereby increasing our chances of finding the clone. Colony PCR was then performed on several colonies to confirm that the gene and vector were present. Mini-preps were done on those colonies of salutaridinol acetyltransferase that showed positive results. They were then prepared for DNA sequencing. Sequencing of the salutaridinol acetyltransferase showed that the gene and the vector were present and the gene had been placed in the right direction inside of the vector. Salutaridine synthase had a lower transformation efficiency and colony PCR confirmed that one colony carried the gene and the vector. Transformation into *Pichia pastoris* with subsequent assay tests will be done in the future.	**Smith, Erica*** **Dr. Toni Kutchan, Donald Danforth Plant Science Center; Langston University, Langston, OK**
REGULATING CB_2 CANNABINOID RECEPTOR PHOSPHORYLATION	Many effects of cannabis and the endogenous cannabinoids are mediated by G protein-coupled receptors (GPCRs), CB_1 and CB_2. GPCR signaling is often regulated by phosphorylation of the receptor. We hypothesized a single amino acid replacement of serine at position 352 in the human CB_2 (hCB_2) receptor by alanine will prevent hCB2 receptor phosphorylation and internalization and prevent recruitment of the G protein receptor kinases (GRKs) 2 and 3. This hypothesis is	**Atkinson, Brittanie*** **Dr. B. Atwood, Dr. K. Mackie, Department of Psychological & Brain Sciences and the Gill**

61	based on previous findings that hCB_2 is phosphorylated at Ser352 following hCB_2 activation and phosphorylation leads to the internalization of other GPCRs. A PCR-based mutagenesis approach was used. Briefly, sense and antisense primers were used to amplify and mutate the portion of hCB2 containing Ser^{352}. Reaction mixtures were analyzed for the presence of the desired amplicon by electrophoresis in 0.8% low melt agarose stained with ethidium bromide. The product was extracted using a QIAquick Gel Extraction Kit. The amplicon was restriction digested with Bcl 1 and Bgl 2 and then ligated into a vector (pHhCB2-pcDNA3) containing hCB_2 that had been cut with Bgl 2. Competent bacterial cells were transformed with the ligation mix. DNA was obtained from the transformed bacterial colonies and proper incorporation of the mutation was assessed by DNA sequencing. The role of Ser352 phosphorylation will be assessed by transfecting HEK293 cells with the mutated CB2 receptors and GFP-GRK3 or GFP-GRK2. Both hCB_2 internalization and recruitment of the GFP-labeled GRK's will be measured and compared to control HEK293 cells transfected with wild type hCB2 and GFP-GRK3/GRK2. Other research has shown that GRK3, rather than GRK2 plays a more significant role in GPCR internalization. Thus, I purpose that if there is a distinct difference between the wild type hCB_2 and the mutated hCB_2 the difference will be seen with GRK3. Preliminary issues in mutating hCB_2 included difficulties with cutting the insert before ligation. Gel electrophoresis analysis showed unexpected cuts in the amplicon. This was due to an overlooked BamH I site in-between the desired site that could produce more than 5 different unwanted products. This issue was solved when we replaced BamH with Bcl I.	**Center for Biomolecular Science,** **Indiana University at Bloomington** **Bloomington, IN** **Langston University** **Langston, OK**
RESPONSE OF C. ELEGANS AND KONZA SOIL NEEMATODES TO DIFFERENT BACTERIAL ENVIRONMENTS **62**	Most productivity that takes place in grasslands ecosystems is located belowground. These belowground communities are very important to their ecosystem and can also be very informative to what is going on in our environment as a whole. Nematodes are the most abundant invertebrates in the soil. They are very responsive to change in environmental conditions and can be grown in the lab on agar plates, which is very convenient. The objective of my research is to determine the response of *C. elegans* and Konza nematodes to different bacterial isolates and determine if these isolates are pathogenic. Running a TD50, I found that *Pellioditis sp.*, *Mesorhabditis sp.*, *Osheius sp*., and *Acrobeloides sp*. grows better on *E.coli* -GFP rather than *Pseudomonas* sp. I also found that GFP does not affect the bacteria. My results also show that the bacteria do infect the animals. Environmental change affects soil bacteria which affects nematode communities. The results suggest that differential response to bacterial pathogens might drive the observed changes in nematode communities in response to environmental perturbations.	**Okonobo, Ivorie D.*** **Dr. Joseph D. Coolon,** **Dr. Micheal A. Herman,** **Division of Biology,** **Kansas State University,** **Manhattan, KS** **Department of Biology,** **Langston University,** **Langston, OK**
RETROTRANSPOSONS IN *POA ARACHNIFERA*	The three classes of retrotransposons (mobile genetic elements) are retrotransposons, transposons, and MITEs. Retrotransposons copy themselves to RNA and then, via reverse transcriptase, back to DNA. The two subtypes of retrotransponsons include long terminal repeat (LTR), and non-LTR. The size of LTR range from approximately 100 base pair to over 5 kilobase pairs, and are further sub-classified into Ty1-copia and Ty3-gypsy groups based on their degree of sequence similarity and the order of encoded gene products. Ty1-copia and Ty3-gypsy groups of retrotransposons are commonly found in high copy number (up to a few million copies per haploid nucleus) in plants with large genomes. Ty1-copia retrotransposons are abundant	**Roseburr, Johnnie*** **Dr. Sharon Lewis,** **Dr. John Coleman,** **Department of Chemistry1 Department of Chemistry Langston University, Langston, OK**

63	in species ranging from single-cell algae to bryophytes, gymnosperms, and angiosperms. Ty3-gypsy retrotransposons are also widely distributed, including both gymnosperms and angiosperms. Retrotransposon can induce mutations by inserting near or within genes. Furthermore, retrotransposon induced mutations are relatively stable, because the sequence at the insertion site is retained as they transpose via replication mechanism. The purpose of this research was to identify retrotransponsons in *Poa arachnifera* contained in 300 nucleotide sequences obtained from the USDA. *Poa arachnifera* (bluegrass) is a cool seasonal, perennial grass with a polypoid genome typically consisting of n=7=56 to 84 chromosomes. Little is known about the genomic composition or relationship of the *Poa* genus and few molecular markers have been generated. The interns in the Chemistry Department at Langston University identified a total of 55 retrotransposon, in *Poa arachnifera* including: P-SINE r31, copia-type, RIRE5 DNA, RIRE9 DNA, OSR3 – 1, Ty1 – copia, Ty3 – gypsy, RIRE, RIRE1, and Rrt23- copia – like.	
ROLE OF CONTRACTILE MYOEPITHELIAL CELLS IN THE SECRETION OF SALIVA **64**	Myoepithelial cells are proposed to generate the contractile force responsible for secretion of saliva from salivary glands. Myoepithelial cells can be distinguished from secretory epithelial cells by the expression of the cytoskeletal protein alpha-smooth muscle actin (ASMA). The objectives of this study were to investigate the morphological organization of myoepithelial cells in glandular tissue and whether the expression of ASMA affects the contractile function of myoepithelial cells in salivary glands. Myoepithelial morphological organization in salivary and mammary glands was analyzed in transgenic mice carrying an ASMA promoter-GFP transgene. Myoepithelial cells exhibited extended processes surrounding the basal surface of lobules consistent with a contractile function. To determine the role of ASMA in saliva secretion ASMA null and wild type mice were analyzed. After 18 hours of fasting, mice were injected with an isoproterenol/pilocarpine solution (I.P.) to induce saliva secretion. Saliva secretion was quantified using absorbent wicks over a 15 minute period. Saliva secretion was reduced by 47% in ASMA null compared with wild type mice ($p<0.019$). These results support the hypothesis that myoepithelial cells are contractile and that ASMA expression plays an important role in their contractile function.	**William, Damon*** **Dr. C.J. Haaksma, Dr. J. Tomasek, Department of Cell Biology, University of Oklahoma Health Science Center, Oklahoma City, OK** **Department of Biology, Langston University, Langston OK**
SEX CHROMOSOME ABNORMALITIES IN SYSTEMIC LUPUS ERYTHEMATOSUS	Recent work has shown that men with Klinefelter's syndrome (47,XXY) are 14-fold increased among men with systemic lupus erythematosus (Scofield, et al, 2008). This increase predicts a rate of lupus in 47,XXY men that is equivalent to 46,XX women and 10-times greater than in 46,XY men. These observations prompted a comprehensive review of any contradictory data concerning sex in the 6433 lupus cases and 5261 controls, mainly in the Lupus Family Registry and Repository. We began by searching the genotyping results for men who had been genotyped as women, which might be explained by mislabeled samples, genotypic 46,XY men living as women (transvestites), or 47,XXY men (Klinefelter's syndrome). We found 11 men who were alleged to have two X chromosomes. We used 6 microsatellites to determine whether any of these men had polymorphic X chromosomes. We will attempt to collect new samples any men who appear to be polymorphic at X. In the meantime, the evaluation of a lupus patient with Turner's syndrome 46,X del Xq, shows evidence for two copies of genes in X, except for Xq, where there is only one copy in this patient. At this point, chromosome	**Harding Jr. James W, *** **Oklahoma Medical Research Foundation Langston University, Langston OK**

65	analysis now shows evidence for Klinefelter's syndrome (47,XXY) or a mosaic of normal and Klinefelter's syndrome (46,XY/47,XXY) in 7 of 238 (2.94%) male lupus patients, continuing to confirm the high level of Klinefelter's among men with lupus. Clearly, sex chromosomes influence the risk of lupus. What makes this happen will be the subject of much future research.	
SIGNAL AMPLIFICATION BY REDOX CYCLING AT AN INTEGRATED MICROELECTRODE ARRAY IN A MICROCHANNEL DEVICE **66**	Background The interest in the development of automated devices that can perform multiple steps for the analysis of samples using small volumes has generated research involved in developing new ways of incorporating electrochemical detectors with these lab-on-a-chip (LOC) devices. Purpose/Problem A new device that integrates a poly(dimethylsiloxane) (PDMS) microchannel with a microelectrode array for electrochemical detection of a sandwich type immunosorbant assay (ELISA) was fabricated and characterized. The PDMS channel was adhered to a glass slide containing the electrode array and the channel was closed by clamping the PDMS covered glass slide with a piece of plain or gold coated silicon wafer. Materials & Method The electrode array used contained 20 individually addressable electrodes. The working electrodes were 50 mm wide and 500 mm long, separated by 25 mm gaps. Its length was defined by the 500 mm wide and 29 mm deep channel. This device was used to investigate the signal amplification effects of generation/collection (redox cycling) experiments and the advantages of this type of electrochemical detection for use in detecting para-aminophenol (PAP_R), the electroactive species generated in the mouse IgG sandwich type ELISA model system. Results Instrumentally-induced (or active) redox cycling resulted in amplification factors as high as 1.65 V for the closed channel, internal 3-electrode setup. The observable detection limit of PAP_R was determined to be 4 mM. Discussion Preliminary results for the detection of PAP_R, generated by incubating para-aminophenylphosphate (PAPP) with the immunoassay, indicated that this device was an effective detector for the mouse IgG model system. Conclusion Future work will involve determining the optimal electrode dimensions, interelectrode spacing, and electrode configuration for achieving the highest signal amplification. Once the device is perfected, it can be used to optimize the mouse IgG model system. Even lower detection limits are expected because smaller interelectrode spacing and smaller electrodes enhance the effects of redox cycling. The mouse IgG model system can later be applied to developing assays for the detection of other biological species of medical interest, such as paralytic shellfish toxins.	**Brumfield, III, Leethaniel*** **Penny Lewis,** **Emily Anderson,** **Dr. Ingrid Fritsch,** **Department of Chemistry & Biochemistry,** **University of Arkansas, Fayetteville , AR** **Langston University, Langston OK**
SKELETAL MUSCLE PROPERTIES IN RELAXING, RIGOR-MG, AND CONTRACTING SOLUTIONS	Skeletal muscle comprises some 40-50% of the total body mass index in mammals, it and constitutes part of the largest organ system in their bodies. Skeletal muscles vary in size, shape, and arrangement of fibers, which makes their properties quite unique. Each skeletal muscle fiber is a single cylindrical muscle cell. Interestingly, an individual skeletal muscle can be made up of hundreds, or even thousands, of muscle fibers bundled together and wrapped in a connective tissue covering. The basic unit of muscle contraction is the sarcomere, which requires the overlapping of both myosin and actin. When muscles contract, protein filaments slide together, which best	**Brumfield III, Leethaniel*** **Dr. Julian Borejdo,** **Dr. Irina Akopova** **Department of Molecular Biology & Immunology,** **University of North Texas Health,**

67	explains why muscle contraction is like climbing a rope, since the crossbridge cycle of "grab, pull, and release," is repeated over and over again. Just as ATP is required for the relaxation of muscles, ATP is also the energy supply for the contraction of muscles. ATP is so essential and inevitable to both relaxation and contraction that when it runs down after death, muscles go into a state of rigor mortis. Since muscles can change their properties under different conditions, the specific focus of this research was on the properties of the muscles under two types of labeling procedures: RLC-Rhodamine (ATPase Activity #1) and 707-Rhodamine (ATPase Activity #2). The properties of the skeletal muscle fibers were examined both by their ability to contract and develop tension, and by the rate of ATPase activity of their myofibrils.	**Fort Worth, TX** **Langston University** **Langston Oklahoma**
STRATEGY FOR IDENTIFYING EPITOPES OF ROD □-TRANSDUCIN INVOLVED IN ITS TRANSLOCATION IN RAT PHOTORECEPTOR CELLS **68**	Rod α-transducin (rT□) is a retinal protein related to light adaptation. In the dark, rT□ is in the rod outer segment and redistributes to the rod inner segment in light. We think these results from rT□ interacting with other proteins. The objective of this project is to generate DNA constructs which express the middle third of rT□ (rT□-M). These vectors will ultimately be used to transfect rod cells in vivo to evaluate the participation of rT□-M in translocation. The rT□ cDNA was cut into thirds. The middle third of rT□-M was put into two expression vectors. The first creates a fusion between rT□-M and the His/Myc tag, which is used to distinguish it from the endogenous rT□protein. The second allows rT□-M-His/Myc mammalian (293 and 293T) cells to be co-expressed with Enhanced Green Fluorescent Protein (EGFP) as a visual marker. Successful constructs will be used in vivo to analyze the translocation process. Restriction analysis showed that the rT□-M constructs were correctly made. Fluorescence microscopy demonstrated many green cells in those cultures transfected with control EGFP vectors and Western blots confirmed EGFP expression. However, similar analysis of cells transfected with the rT□-M constructs showed EGFP cells but rT□-M was not detected. The data shows that the DNA constructs are correct and that the transfection procedure works. However, the absence of rT□-M protein suggests that its specific amino acid sequence results in its rapid degradation. This work was supported by an NEI core grant EY12190, P20 and by an unrestricted grant from OUHSC.	**Bradford, Amber*** **S. Sezate,** **L. L. Wong,** **J. F. McGinnis'** **Department of Ophthalmology and Cell Biology,** **OCNS, Dean McGee Eye Institute,** **University of Oklahoma Health Sciences Center** **Langston University** **Langston Oklahoma**
SYNTHESIS AND COMPARISON OF THIOL VS. NON-THIOL CLEAVAGES OF BOVINE LACTOFERRICIN PEPTIDES **69**	With the increase in multidrug resistant bacteria there is a need to understand the properties of natural occurring antimicrobial peptides. Antimicrobial peptides are future candidates for newly made antibiotics. Lactoferricin Bovine (20-25), an antimicrobial hexapeptide, is believed to exert its effect directly on bacterial cellular membrane lipids. In order to learn more about these interactions three derivatives of Lactoferricin B were synthesized by Solid Phase Peptide Synthesis (SPPS) and cleaved with Thiol and Non-Thiol (TIPS) cleavage cocktails. The qualities of the peptides were analyzed by HPLC and MS and the peptide/lipid interaction was observed through NMR. Final data indicates that Non-Thiol cleavages produced better yields of peptides and more consistent results.	**Anderson, Quincy*** **Denise V. Greathouse** **University of Arkansas, Department of Chemistry & Biochemistry** **Fayetteville, AR** **Department of Chemistry, Langston University, Langston, OK**
THE ASSOCIATION BETWEEN MICROALBUMINURIA	Microalbuminuria (MA) is defined as an increase in urinary albumin excretion (UAE) caused by damaged glomeruli. Since glomeruli are damaged, albumin passes through its filtering mechanism and appears	**Thomas, Victoria*** **Dr. Roberto Cardarelli,**

AND CORONARY ARTERY CALCIUM SCORES **70**	in the urine. Studies have revealed that MA is common among related to hypertensive patients and in individuals with chronic kidney disease, thus potentially functioning as a marker of cardiovascular disease (CVD). Coronary artery calcium (CAC) scores measure the calcium burden in coronary arteries and have been found to be a strong marker for future cardiovascular events. This study's purpose was to assess the association between MA and CAC scores, while taking into account traditional CVD risk factors. This cross-sectional study involved 200 African American, White, and Hispanic men and women over the age of 45 and no history of heart, kidney, or liver disease. Participants completed a questionnaire that included sociodemographic information, medical history and various psychosocial factors. CAC scores were measured using a 16 slice computerized axial tomography (CAT) scan of the heart. CAC was dichotomized as the presence of calcification (Agatston score of > 0) versus no calcification (Agatston score of 0). Urinary albumin was quantified by using a random urine sample and turbidmetric and colormetric techniques by a centralized diagnostic laboratory. A urine albumin-to-creatinine ratio (ACR) was calculated. Clinical MA is defined as an individual having an UAE $\geq$ 30 µg/mg during a 24 hour period. However, sex-specific ACR cut-points were also used to define MA ($\geq$17 µg/mg in men and $\geq$25 µg/mg in women). MA was scored as a dichotomous variable: no MA and the presence of MA. Calcium scores ranged from 0 to 3987, with 38% of the participants having a calcium score greater than zero. After adjusting for common CVD risk factors (age, LDL, gender, race, BMI, hypertension, diabetes, smoking, education and income), those with MA had a 20% increase of having a high coronary artery calcium score. Females with MA had a 6% increase of having a high calcium score. Males with MA had a 70% reduction of having a high calcium score. Results did not achieve statistical significance. Although our results did not show that the presence of MA is significantly associated with high calcium scores, the results were worth noting. It is possible that MA simply functions as a mediator between coronary artery disease and chronic kidney disease (CKD).	**DO, MPH, FAAFP, Ana Chiapa, MS, MPH; University of North Texas Health Science Center, Denton, TX** **Langston University, Langston OK**
THE CEREBELLUM: A HISTOLOGICAL ANALYSIS. **71**	The cerebellum is the largest part of the hindbrain and occupies the greater part of the posterior cranial fossa. The cerebellum plays a crucial role in movement and posture indirectly. Subsequently, we have undertaken a study to examine the neuroanatomy of the female monkey cerebellum, an area implicated in mental health, cognitive functions and rehabilitation. Female monkeys (M. fascicularis) were ovariectomized and treated with estradiol benzoate. The monkeys were perfusion fixed and the brains removed. Post- fixed brains were sectioned and store in buffer until staining. Sections were histologically stained using cresyl violet and immunocytochemically stained using the macrophage marker LN1 (identifies microglial cells). Processes were identified in the cerebellum. The cytoplasm of these cells was often clear, while others contain grainy particulate matter. Processes occupied A6 through A1 anterior levels with no cells present in the APO transition levels. Level P1-P6 contained copious amounts of processes. Occupation of microglial cells in normal cerebellum could serve a neuroprotective function. In turn, estrogen may serve to increase both local and general microglial activities in the event that cerebellar tissue repair is needed, protecting against infection.	**Patterson' James A. *** **Dr. Sonya J. Williams, Dept. of Biology[1] and Physical Therapy, Langston University, Langston, OK**

THE CYCA1;2 PROTEIN PROMOTES NUCLEAR ENVELOPE BREAKDOWN DURING MEIOSIS II IN ARABIDOPSIS ANTHERS **72**	Mitotic cyclins are known to regulate the G2-Phase to M-phase transition and the exit of the M-phase in the mitotic cell cycle, but much less is known about the role of mitotic cyclins in the mitotic cell cycle that consist of one round of chromosome duplication and two rounds of nuclear division. The tardy asynchronous meiosis (tam) mutant of Arabidopsis thaliana is defective in the CYCA1;2 protein that is an A-type cyclin. It has been previously found that tam is slower in progression of prophase I and prophase II, and is abnormal in chromosome dynamics during the two phases (Magnard et al., Yixing Wang, and Ming Yang, unpublished results). These findings suggest that CYCA1;2 might regulate multiple aspects of nuclear dynamics during the prophase of meiosis. In this study, we investigate the breakdown of the nuclear envelope in the male mitotic prophase of tam. Fixed anthers of wild type and tam at various male meiotic stages were dissected and stained with DiOC6 (3,3' dihexyloxacarbocyanine iodide) for the nuclear envelope and DAPI (4',6 diamidino-2-phenylindole) for the nuclear DNA. The processed samples were then observed under a fluorescence microscope. We found that the nuclear envelope in prophase II of tam is unusually stabilized, indicating	**Charlot, Adrienne*** **Dr. Ming Yang** **Oklahoma State University** **Stillwater, OK** **Langston University,** **Langston OK**
THE EFFECTS OF MECHANICAL WOUNDING ON THE METABOLOME OF ARABIDOPSIS THALIANA **73**	Plants are subject to various types of physical damage (insect feeding, wind, hail, and other environmental stresses), which can be referred to as wounding. In *Arabidopsis thaliana*, mechanical wounding has been shown to induce genes, but very few studies have documented changes in the metabolome of *Arabidopsis thaliana* due to mechanical wounding. Our objective was to study, by mass spectrometry, the changes in the metabolome of *Arabidopsis thaliana* following mechanical wounding. *Arabidopsis thaliana* plants were wounded using a hemostat across the midvein of the leaves and immediately frozen in nitrogen and lyophilized. A biphasic extraction system, water and chloroform, was used to extract polar and nonpolar metabolites from 6 mg of pulverized plant tissue samples. Polar and nonpolar plant metabolites from wounded and unwounded plants were analyzed, after derivatization, by gas chromatography-mass spectrometry (GC-MS). GC-MS analysis is limited to low molecular weight metabolites (*m/z* 50-650) and by the need to derivatize them prior to analysis. In order to complement/extend our results obtained by GC-MS, metabolites were also directly analyzed by electrospray ionization hybrid quadrupole/time-of-flight tandem mass spectrometry and electrospray ionization Fourier-transform ion cyclotron resonance mass spectrometry. These instruments detect metabolites with masses from 50 to 1500 *m/z* with precision and accuracy, facilitating the identification of the molecules. A preliminary assessment of the results revealed that wounding induced specific changes in the metabolome of *Arabidopsis thaliana*. Our results will contribute to building a working library of polar and nonpolar metabolites to be used in future metabolomic studies with *Arabidopsis thaliana*.	**Atkinson, Brittanie*** **Dr. R. Jeannotte,** **Dr. P. Tamura,** **Dr. R. Welti R.,** **Kansas Lipidomics Research Center, Kansas State University,** **Manhattan, KS** **Division of Biology,** **Langston University,** **Langston, OK**
THE EFFECTS OF ANESTHESIA ON FEMALE RATS EXPOSED TO CHRONIC ALCOHOL	It has been proven that female rats have a higher response to ethanol than males. Previous experiments have shown that after chronic exposure to ethanol, female rats appear to have a significantly higher sensitivity to anesthesia than male rats. The objective of our study was to determine the sensitivity to anesthesia after chronic exposure to alcohol in female rats. The rats were trained to maintain their balance on the rotarod for 10 minutes before being injected with sodium pentobarbital. We observed the amount of time they required to	**Marquita Rowland*** **Dr. L. Gonzalez,** **T. Adams,** **E. Kratz,** **D. Henthorn** **University of Oklahoma Health Sciences Center,** **Oklahoma City, OK**

74	regain their righting reflexes and their times on the rotarod set at 20 rpm until they maintained balance for ten minutes. The rats were then exposed to ethanol vapor for 7 days. One week later, they were anesthetized again and underwent the same rotarod procedure. Our results suggest that female rats have an increased sensitivity to anesthesia (sodium pentobarbital), including a higher mortality rate.	**Langston University, Langston, OK**
THE EFFECT OF PRECOCENE II ON THE FATTY ACID METABOLISM IN PEA APHIDS **75**	The pea aphid, *Acyrithosiphon pisum* is a small, soft-bodied insect belonging to the superfamily Apidoidea, within order Homoptera. Aphids are a pest with world-wide distribution. For most animals, lipids are necessary dietary components due to their essential fatty acids. Aphids seem to be an exception in that they synthesize all their required fatty acids *de novo* except □-linolenic acid (□ ^{9,12,17}- 18:3). Derivatives of fatty acids such as prostaglandis, regulate biochemical and physiological functions in animals. Understanding how insects regulate fatty acid metabolism may lead to exploitation of these important pathways in control methods. Juvenile hormone may regulate lipid metabolism and the corpora allata is the source of JH in insects. The Mechanism of precocene II action is by progressive degeneration of the corpora allata. The pea aphids were treated with precocene II at 25 and 10 C^{o}. Fatty acids were extracted and analyzed. Effects were noted for the 14:0, 18:2, 18:3, 16:0 fatty acids. The 14:0 was the most significant.	**Glover II, M.*** **Dr. J. Dillwith, Dr. R. Madden, Department of Entomology, Oklahoma State University, Stillwater , OK** **Department of Chemistry, Langston University, Langston OK.,**
THE EXAMINATION OF SIGMA AND PI ELECTRON INTERACTIONS FOR VARIOUS ROTATIONS OF ALKYL SUBSTITUENTS ON SELECTED CYCLOBUTANEDIONES **76**	The interactions of Sigma and Pi electrons in di-ketone systems have been studied using empirical and theoretical techniques. The Extended HÜckel Molecular Orbital (MO) model is a well-established theoretical application for studying these interactions for substituted cyclobutanediones. This theoretical study will utilize the Extended HÜckel MO calculations to examine the sigma and pi electron interactions for various rotations of alkyl substituents on selected cyclobutanediones with known coordinates. *The Examination of Sigma and Pi Electron Interactions for Various Rotations of Alkyl Substituents on Selected Cyclobutanediones*	**Daniels, Antoine*** **Dr. J.K. Coleman, Department of Chemistry Langston University, Langston, OK**
THE FORMATION OF CONCENTRATION GRADIENTS USING MICROFLUIDICS NETWORKS **77**	Microfluidics is the technological field that deals with the handling of flowing liquids on the micro scale. Microfluidics devices are miniaturized chemical and biochemical analyzers that offer the advantages of an improved efficiency in terms of throughput, response time, and sample volumes. Microfluidics channel networks provide a new opportunity to display well-defined gradients of molecular concentration within membrane fluids. These gradients are very useful in combinatorial experiments such as drug testing. The formation of the techniques used in producing and using the microfluidics devices are critical, since this is a new scientific field. Once all of the techniques are formed, these channels are seen to be a powerful tool for high through-put combinatorial biochemical recognition and drug screening measurements, since the microfluidic channels can be used to form supported bilayer membranes on surfaces.	**Harris, Steven*.** **Dr. Alan Szmodis. Dr. Atul Parikh, University of California-Davis, Davis, CA** **Langston University[1], Langston, OK**
THE FUNCTION OF THE JNK1 SIGNALING	The aim of our research is to understand the role of JNK1 signaling pathway in the embryonic development of zebrafish,	**Bailey, Marshall***

PATHWAY IN ZEBRAFISH DEVELOPMENT **78**	*Danio rerio*. Understanding the function of JNK is important because the mechanisms that regulate embryonic development in the zebrafish also regulate development in human embryos. JNK is a kinase that phosphorylates a diverse set of proteins including the transcription factor c-Jun, and likely regulates multiple embryonic processes; therefore, we hypothesize that JNK is essential for understanding the embryonic development of *Danio rerio.* Wild-type cDNA of the zebrafish JNK1 and its upstream regulators MAP2K4a and MAP2K7 were isolated from standard PCR methods and gel electrophoresis. The purified products were cloned and sequenced to confirm their identity. cDNA containing the open reading frame for each gene was cloned into PCS2+, a plasmid designed for efficient *in vitro* mRNA production. A dominant negative form of JNK1 (DN-JNK) was created by site directed mutagenesis and mRNA was produced by *in vitro*-transcription reaction. This RNA was microinjected into developing zebrafish embryos for analysis and observation of the resulting phenotype.	**Dr. Daniel S. Wagner, Department of Biochemistry and Cell Biology, Rice University Houston TX** **Biology Department Langston University, Langston, OK**
THE ROLE OF *SPORK2* IN ZEBRAFISH HEART DEVELOPMENT **79**	Zebrafish, a vertebrate animal, has become a valuable resource for identifying genes involved in human diseases. Moreover, they are used to identify many genes involved in human embryogenesis. The Spork2 gene was shown to be expressed in the Zebrafish heart development. This gene is similar to genes in humans that regulate cell movements. The expression and function was examined by injecting the embryos with Spork2 Morphilino (Morpholino is a tool for inhibiting specific genes in Zebrafish embryos). The Morpholino knockdown shows that spork2 is required for proper cardiac cell migration and some spork2 morpholino embryos have reversed heart looping. However, Spork2 is not necessary for migration of germ cells and blood vessel precursor.	**Asmamaw, Tsedenia*** **Division of Biology, Kansas State University, Manhattan, KS** **Department of Chemistry, Langston University, Langston, OK**
THE SIX-COLOR THEOREM **80**	The purpose of this study is to prove the Six-Color Theorem. This theorem is a commonly known theorem that is used in the study of Topology. It states that every planar graph can be colored with at most six colors. To prove The Six-Color Theorem, the Planar Graph Fact (every planar graph has at least one vertex of order five or less) is needed. Using an argument by contradiction, the Planar Graph Fact can be proven thus proving the Six-Color Theorem.	**Howard, Rochelle*** **Dr. Paul Kirk, Indiana University, Bloomington, IN;** **Langston University, Langston, OK**
THE TUMORIGENIC EFFECT OF BCRA1-IRIS IN P53 WILD TYPE CELLS **81**	DNA damage by agents such as toxic chemicals or ultraviolet (UV) light activates p53. Upon activation, p53 can induce cell cycle arrest or apoptosis. TP53 gene is mutated/dysfunctional in ~50% of human tumors. However, many human tumors contain wildtype p53, suggesting that mechanisms other than mutation in this gene induces tumor formation. We have found that in cells with wildtype or mutant p53, BRCA1-IRIS (hereafter IRIS) can induce the expression of p53. We also found that the amplification and overexpression of the gene name "*W*ild-type *I*nduced *P*hosphate (WIP1)" is induced by IRIS. WIP1 is a phosphatase that dephosphorylates/inactivates p53 as well as "The Mitogen-Activated Protein Kinase" (MAPK) p38, which is also activated upon cellular stress. It is thus possible that IRIS overexpression induces tumors in wild-type p53 cells through activation of this phosphatase therefore preventing p53's tumor suppression function, especially in cells exposed to genotoxic stresses, such as UV or hypoxia.	**Johnson, Brittany S.*** **Dr. Wael M. ElShamy; Department of Pharmacology & Experimental Therapeutics, Loyola University Medical Center, Chicago, IL** **Langston University, Langston, OK**

THE WATER EXTRACTION FROM SWITCHGRASS OF COMPOUNDS THAT INHIBIT LOW DENSITY LIPOPROTEIN OXIDATION **82**	Switchgrass is a perennial grass that is native to North America and Canada. Switchgrass is scientifically significant because the ethanol extracted from it can be used as an alternative energy source that could safely rival the fossil fuels being utilized today. Policosanols and vitamin E are other value added products that can be extracted from switchgrass. Policosanols are mixtures of long-chained primary alcohols. Policosanols can be extracted from beeswax, sugar cane, and other waxy materials. Policosanols are important because they exhibit significant cholesterol-lowering effects. They supposedly inhibit the oxidation of low density lipoprotein (LDL). Previous studies have shown that LDL oxidation leads to a degenerative accumulation of lipid-containing plaques on the innermost layer of the wall of an artery. Currently we have performed many copper mediated LDL assays. The logistics behind the assay is to figure out what substance inhibits LDL from oxidizing.	**Chandler, Jason*** **Dr. Julie Carrier,** **Dr. Ed Claussen,** **Nirmal Uppungundla,** **Sathya Vandhana,** **University of Arkansas,** **George Washington Carver Program** **Fayettteville, AR** **Langston University,** **Langston, OK**
TIME-LASPE CINEMATOGRAPHY OF THE CROWN-OF-THORNS STARFISH (ACANTHASTER PLANCI L; ECHINODERMATA, ASTEROIDEA): NOCTURNAL ACTIVITY, SOCIAL INTERACTION, AND HIDING **83**	The Crown-of-Thorns starfish (COT; *Acanthaster Planci* L.) is a corallivorous starfish occurring on western Indo-Pacific coral reefs. Population explosions of COTs have occurred at 10-20 yr intervals, removing up to 90% of live coral cover on some reefs. We studied their movement and feeding patterns, social interactions between them and nocturnal/diurnal behavior. Underwater time-lapse cinematography was used to monitor COTs continually for up to three days, using a modified Bolex 16 mm cine camera, capable of taking single-shots. Custom-designed underwater housing, tripods, an electronic automatically adjusting flash and a battery pack allowed the camera to be used successfully in this environment. Areas sampled were Helix and Rib Reefs, Great Barrier Reef, at 2-6 m depth for 1-3 days per film. Time intervals between frames were 10-34 secs. The starfish were found to be generally nocturnal. Minor movement occurred during the morning, but this was mostly re-location, not feeding. No movement occurred in the afternoon or dusk. This was consistent between different seasons, reefs, and months on the same reef. Social interactions occurred between COTs was noted during the evening. COTs encountered each other, sometimes raising the arms in the closest proximity slightly and allowing their tube feet to touch for 10-30 minutes. We propose that this may be related to sex determination, mating behavior, or communication regarding the presence and possibly location of food, etc. COTs can home, leaving a feeding site for ~10 hrs, relocating that same site, returning to it, and orienting in almost the same position as before. COTs appear to have a memory of feeding locations and can navigate to them. A sequential lifting movement of arms in a circular pattern was observed during feeding. This may be related to enhancing respiration when oxygen transfer via the tube feet is limited due to extensive contact with coral tissue.	**T. A. Rider,** **B. Mayes,** **S. Williams,** **P.W. Sammarco,** **J.H. Caleton** **Louisiana Universities Marine Consortium (LUMCON), Chauvin, LA** **Langston University,** **Langston, OK**
TOWNSEND (ELECTRON) AVALANCHE	An Electron Avalanche is a cumulative ionization process in which the ions and electrons of one generation undergo collisions that produce a greater number of ions and electrons in succeeding generations. This process of multiplication continues until the electrons reach the detector anode whereupon they are collected and an electrical pulse measured. Since each ion-pair produced by the original passage of radiation through the argon has resulted in many	**Muhammad, Manssa*** **Dr. Joel Snow,** **Department of Mathematics,** **Langston University,**

84	secondary ion pairs the resulting signal is significantly amplified to the second or even forth order.	**Langston, OK**
TRABECULAR MESHWORK CELLS: A MODEL SYSTEM TO EVALUATE GLUCOCORTICOID-INDUCEDPHAGOCYTOSIS **85**	Millions of people have been diagnosed with glaucoma. Glucocorticoids exacerbate the effects of open-angle glaucoma by increasing the intraocular pressure. Glucocorticoids alter the ability of trabecular meshwork (TM) cells to phagocytose extracellular material and thus can increase the intraocular pressure. Dexamethasone (DEX) is a type of glucocorticoid that has been shown to inhibit the ability of trabecular meshwork cells to phagocytose. Our hypothesis is that cultured cells from glaucoma patients and from patients without glaucoma treated with DEX would ingest less beads then untreated cells. Four assays were conducted on two lines of cells NTM174-04, non-glaucomus, and GTM520-05, glaucomus. Beads were used to track the abilities of the cells to phagocytose. Cells were treated with DEX (100nM) then incubated with beads coated with rabbit IgG. Next, they would be fixed and incubated with goat anti-rabbit IgG 633 dye to differentiate intracellular from extracellular beads. DAPI (6'4-Diamidino-2Phenylindole) was used to calculate how many beads per one hundred cells were phagocytosed. The data collected showed that when GTM520-05 cells were treated with DEX they ingested fewer beads. GTM520-05 cells were more sensitive to the DEX treatment than NTM174-04 cells.	**Ognibene, Cherie*** **Dr. Xinu Zhang,** **Dr. Thomas Yorio,** **University of North Texas Health Science Center** **Fort Worth TX** **Langston University,** **Langston OK**
UNDERSTANDING THE MECHANISM OF TRICHLOROACETIC ACID-INDUCED PRECIPITATION OF PROTEINS **86**	Protein folding is a process by which an unfolded polypeptide chain folds into a specific native biological active structure. Protein aggregation is a widespread phenomenon that occurs during protein folding *in vivo* and *in vitro*. Understanding the mechanism of protein aggregation is important in solving the problem of formation of inclusion bodies during overexpression of recombinant proteins in host vectors and also in the prevention and cure of various human diseases (including Alzheimer's disease). 2,2,2-trichloroacetic acid (TCA) is a well-known protein precipitating agent. In the present study, we attempt to understand the mechanism by which TCA induces precipitation of proteins, using various biophysical techniques including polyacrylamide gel electrophoresis, steady state fluorescence, 8-anilino-1-napthalene sulfonate (ANS) binding, circular dichroism, and multidimensional NMR spectroscopy. The TCA-induced protein precipitation curves are observed to be U-shaped and maximum protein precipitation is observed between 5 % to 45 % (w/v) of TCA. TCA-induced protein precipitation curve does not significantly depend on the nature and size of the protein. However, in the presence of increasing concentrations of urea (denaturant), the amount of protein precipitated is significantly decreased. It is observed that the protein-precipitate-inducing effects of TCA are due to the trichloro group. Using acidic fibroblast growth factor (aFGF), as a model protein, we attempt to understand the molecular basis for the TCA-induced effects. We demonstrate that aFGF is in a partially structured "molten-globule" state in 5 % (w/v) sodium trichloroacetate (STCA). It appears that TCA-induced protein precipitation occurs through coalescence of partially structured state(s) of the protein.	**Charles Loftis, Charles*** **Dr. TKS Kumar,** **Department of Chemistry and Biochemistry,** **University of Arkansas** **Fayetteville, AR** **Department of Chemistry,** **Langston University,** **Langston OK**
UNRAVELING THE CHARACTERISTICS THAT CONTROL	With the sequencing of the human genome and other advances we have come to understand that many diseases, including cancer and diabetes, are fundamentally due to aberrant flaws in transcriptional regulation. These diseases could potentially be cured if we could find	**Harris, Steven M.*** **Dr. Steven P. Rowe,**

TRANSCRIPTIONAL ACTIVATOR POTENCY **87**	a way to produce potent yet tunable artificial regulators capable in correcting errors in transcription. Since a better understanding of the characteristics that control potency of transcriptional activators is needed, it has proven difficult to develop potent artificial activators. What has been found is that potency is likely controlled by some combination of affinity of the activators for their target protein, transcriptional machinery binding site, and the rate of proteolysis. We want to investigate the role of the binding site versus the rate of proteolysis for these ligands. We have finished the design and successfully synthesized the analogs to these ligands that would be resistant to proteolysis. We selected our target protein, Gal-11, from the tail group of the mediator. Using phage display two peptides were shown to demonstrate the highest affinity to Gal-11. Fluorescent polarization was used to determine how well these ligands bound to the target protein and these proteins were synthesized. We designed the analog peptoids to these ligands on the basis of their resistance to proteolysis and these analog peptoids were also successfully synthesized. We are currently investigating the ability of the analogs to regulate transcription so that we can determine the relative roles of the binding site and rate of proteolysis in determining potency.	**Dr. Anna K. Mapp, Department of Chemistry, University of Michigan, Ann Arbor, MI** **Department of Chemistry, Langston University, Langston Oklahoma**