



Fifteenth Annual
Student Research/Scholarly Activity Fair
April 16, 2008



Memorial Student Union Ballroom
12:00 - 3:00 p.m.

Fifteenth Annual
Student Research and Scholarly Activity Fair
Wednesday, April 16, 2008

Welcome,

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

I wish to extend my personal thanks to all who played a part in making this event happen, particularly to President John Hays who always seems to find funds to support research and other scholarly activity at all levels throughout the University and to Provost Blake Sonobe for his continuing support for the committee. Special thanks, also, to Ms. Anita Blankenship, Director of Sponsored Programs, and Ms. Berva Pool, Sponsored Programs Specialist, for their continuing support for the Committee. Thank you to Karen Wilson in the Website Management Department for her help in coordinating the online application process. And, to the members of the Committee, thank you for your dedication and support as we all worked together to make this event a reality.

Most of all, thank you to all the faculty, staff and administrative sponsors who find a way to integrate students into various areas of research and other forms of scholarly activity. The extra effort yields dividends for the future as students discover the excitement research and scholarly pursuits can generate.

Sincerely,



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

Committee Members

Dr. Stephen Burgess

Ms. Dayna Coker

Dr. Les Ramos

Dr. Valarie Reimers

Dr. Muatasem Ubiedat

Ms. Anita Blankenship (Ex. Officio)

Title, Student, (Sponsor), Department, Abstract

1. **Birthday Follies.** Vaibhav Pandya, Sulav Regmi, and Cammi Valdez (Dr. Bill Sticka) Department of Mathematics

In the study of probability, one encounters a surprising number of results that are counterintuitive to say the least. For example, in a room with only 23 people, the chance that at least two of them share the same birthday (month and day) is better than 50%! However, if someone in the room stands up and announces their birthday, then 253 people need to be crammed inside the room to get a 50% chance of finding a birthday match. In addition to deriving both these results, we compute the smallest number of people needed in a room to get a 50% chance that three or more of them match birthdays. Furthermore, for each of these scenarios, we also derive a general formula for the probability that at least k out of n people in a room will share the same birthday.

2. **Let's Make A Deal.** Vaibhav Pandya, Sulav Regmi, and Joe Wilson (Dr. Bill Sticka) Department of Mathematics

The Monty Hall Problem is a probability puzzle loosely based on the 1960's TV game show "Let's Make A Deal" hosted by Monty Hall. It appeared in a letter to Marylin vos Savant's popular "Ask Marylin" question-and-answer column in Parade magazine. Craig F. Whitaker of Columbia, MD wrote: Suppose you're on a game show, and you're given the choice of three doors. Behind one door is a car, behind the others, goats. You pick a door, say number 1, and the host, who knows what's behind the doors, opens another door, say number 3, which has a goat. He says to you, "Do you want to pick door number 2?" Is it to your advantage to switch your choice of doors? Marylin's response "switch because the probability you'll win the car is $2/3$ " caused an avalanche of correspondence, mostly from people who would not accept her solution. It turns out that Marylin's solution is correct, as long as additional assumptions are imposed on the problem. We provide a thorough analysis of the Monty Hall Problem and investigate some of its many variations. In particular, we analyze stay versus switch probabilities for an n -door game, as well as stay-switch probabilities for a multi-stage game where the contestant has more than one opportunity to switch their choice of doors.

3. **What You Talkin' About, Willis?** Sulav Regmi (Dr. Bill Sticka) Department of Mathematics

All those years you were told it was wrong, but believe it or not, it really is true. Yes, $(x+y)^2 = x^2 + y^2$! We investigate commutative rings and finite fields of prime characteristic p , the algebraic structures where $(x+y)^p = x^p + y^p$ happens to be true, and provide some examples.

4. **Responsibility Driven Design (RDD) for Photorealistic 3D Scene Generation and Animated Sequences.** Anjana Patel (Dr. Warren Moseley) Department of Entrepreneurship and Computer Systems

3D Scene Generation is often a trial and error process. It is often disguised as artistic creativity. With the coming of 3D complex photorealistic movie making cost effective generation of objects for a complex scene and the synthesis of complex scenes becomes a challenge. In addition the reuse of complex objects in future scene generation presents a significant challenge. In this project we apply a tried and proven design technique called Responsibility Driven Design (RDD) to the creation of complex 3D scenes. RDD is often used for analysis and creation of complex object-oriented software systems. It just so happens that 3D scene generation is object-based and the design techniques will apply seamlessly and provide for a level of scalability not seen with the trial and error process. RDD reduces the generation time, correctness of the 3D representation, and allows for the storage of scene objects, scene placement, scene sequencing, and the ability to search large clusters of scenes for future reuse. 3D animated sequences are computationally expensive. For future animated sequences it will be necessary to reuse characters and scenes to make these efforts cost effective and marketable.

5. **Open Source 3D Character and Scene Generation.** Mike Davis (Dr. Warren Moseley) Department of Entrepreneurship and Computer Systems

Open source software is computer software for which the human-readable source code is made available under a copyright license (or arrangement such as the public domain) that meets the Open Source Definition. This permits users to use, change, and improve the software, and to redistribute it in modified or unmodified form. It is often developed in a public, collaborative manner. There are existing 3D Character and Scene Generation tools that coupled with Open Source Rendering tools can provide a cost-effective solution for generation of Photorealistic Scene Generation and 3D Animation. In this project we created an environment to combine the best of Open Source 3D Tools with a cross platform implementation to provide for experimentation of 3D generation. In addition to providing a development environment there was the connection made between the Computer Lab in Stafford 259 to the Oklahoma Supercomputer for Education and Research at the OU Campus in Norman. This added capability makes 3D content generation much simple and much faster therefore presenting a more feasible solution.

6. **3D Networking Rendering using A Unique Specialized Grid.** Jesse Johnson and Ryan Lutz (Dr. Warren Moseley) Department of Entrepreneurship and Computer Systems

Rendering is the process of producing the pixels of an image from a higher-level description of its components. A render farm is a computer cluster to render computer generated imagery (CGI), typically for film and television visual effects, in off-line batch processing. The rendering of image frames can be a highly parallelizable activity, as each frame can be calculated independently of the others, with the main communication between processors being the upload of the initial source material, such as models and textures, and the download of the finished images. This cost still remains exorbitant for small installations. Over the decades, advances in computer power would allow an image to take less time to render. However, the increased computation is instead used to meet demands to achieve state-of-the-art image quality. The type of compute power needed to produce high quality images has been left to the supercomputing facilities. However with the capability to use the parallel nature of a group of computers and with the increase of power to the desktop computer this has become a more cost effective process. In this project we study the speed improvements by just using simple desktop computers and the capabilities of grid computing in a small environment.

7. **Interactive Simulation and Problem Solving on an Apollo Mission Control Console.** David Goree (Dr. Anil Pereira and Dr. Warren Moseley) Department of Entrepreneurship and Computer Systems

We are developing a system for interactive simulation and problem solving on an Apollo Mission Control Console at the Stafford museum in Weatherford. The simulation will give children and adults a feel for the Apollo Mission Control process. Activities such as count down, launch and communication with astronauts will be simulated. Problem solving such as diagnostics of system warnings based on pre-launch parameters will also be simulated. A large viewing screen, head sets and the Mission Control Console will enable interactive functionality. The Console at present is inoperable. Considerable time and effort will be required to directly interface the Console to a Computer using relays, wires and analog to digital converters. Our system will detect the pressing of buttons on the Console through a Video camera interfaced to a Personal Computer. A Computer program utilizing Computer Vision techniques will analyze the Video output frame by frame to identify the position of any button pressed. Computer Vision is a discipline which involves the extraction of information from single images or a sequence of images. Depending on the position of a button, different sequences of activities will be initiated by executing relevant program subroutines. We will design the hardware and software interfaces, and examine various Computer Vision techniques for detecting the position of objects in images and Video. We will evaluate the performance of various kinds of cameras under varying effects of shadow, reflection and light intensity. We will periodically evaluate our system for accuracy and response times, and make adjustments to the software and hardware interfaces as required.

8. **Rendering of 3-Dimensional Images and Animations in a Grid Computing Environment.** Eric Boehs (Dr. Anil Pereira and Dr. Warren Moseley) Department of Entrepreneurship and Computer Systems

We are developing a Computational Grid for Rendering 3-Dimensional images and animations using our computer lab located in the Stafford Building at Southwestern Oklahoma State University. Grid Computing is a form of Distributed Computing that involves resource and data sharing among multiple organizations. With Grid Computing technology, a virtual Supercomputer can be created from existing computational resources and networks. Rendering is a process of creating realistic 3-Dimensional images from mathematical and graphical models using computer programs. Rendering is a computationally intensive process, and parallel processing is required to complete rendering jobs in reasonable time. Applications can be highly parallelized on a Grid due to the availability of a large number of computers. We will be using the Globus toolkit, open source software used for building Grids. The software will be installed and configured on an Ubuntu base initially. Ubuntu is a Linux Operating System distribution. We will later use other platforms such as Microsoft Windows. We have set up secure remote access capability to resources in our Lab via Secure Shell (SSH). This will enable us to continue with our research work after school hours through remote login from our home computers. We will access files and install software as though we were sitting right in front of a computer in the Lab. Research will be done to find the best way to distribute images among the various computers on the Grid. We need to evaluate if it is best to distribute each image to a different computer, or partition the images and then distribute the resulting components to different computers for Rendering in parallel. Our performance analysis is expected to show high speed up for the Rendering jobs.

9. **Improvement of Encapsulated Dosage Preparation of Radioactive Sodium-Iodide 131 for the Treatment of Thyroid Cancer.** Kyle Eckhardt, Chaz Rutledge, Lisa Quintero, Susan Johnson, Cody Coppock, and Arnold Adams (Mr. Jeffrey Short) Department of Industrial and Engineering Technology

Cardinal Health is the largest provider of specialized nuclear pharmaceuticals used to diagnose and treat conditions such as cancer and heart disease. This project seeks to minimize the time of handling and the radiation exposure for the pharmacist during preparation of encapsulated dosage. The current preparation operation of transferring radioactive sodium iodide-131 from a tungsten container into a syringe and then into a buff therapeutic gelatin capsule exposes the pharmacist to radiation. This exposure is monitored using radiation dosimeters in the form of badges and finger rings. The proposed solution incorporates the existing lead container used to ship the iodide-131. The lid will be modified to increase height, add a magnifying lens, and add LED lights. The new process of withdrawing the solution out of the vile without having to lift and invert the container eliminates physical stress on the pharmacist and provides better shielding. The magnifying glass and LED lights inserted into the extraction lid will greatly increase the visibility of the syringe, making it easier to draw the correct amount of iodide-131. The extraction is a safer, more practical way of extracting the radioactive iodide I-131.

10. **Animation of Jacob R-755 Radial Engine Museum Exhibit.** Kyle Eckhardt, Chaz Rutledge, Lisa Quintero, Susan Johnson, Cody Coppock, and Arnold Adams (Mr. Jeffrey Short) Department of Industrial and Engineering Technology

The Stafford Air and Space museum in Weatherford houses a Jacob's R-755 radial engine. The engine is on loan from the Omniplex in Oklahoma City. The Jacobs R-755 or L-4 is a seven-cylinder, air-cooled, four-stroke engine that was manufactured from 1933 until the 1970s. The project required two objectives: 1) animate the cutaway display and 2) illustrate the firing sequence. The animation of the engine is accomplished by rotating the starter shaft with an electric motor. This allows all components of the engine to move as they do while the engine is running. LED lights are placed to illustrate the firing sequence, red lights for power and blue lights for exhaust. The LED lights are wired into the original magnetos, so the original timing is preserved and the engine illuminates the lights as the pistons arrive to the power and exhaust positions. The action of the drive motor and lights is actuated by a pushbutton located in a podium placed in front of the display. This allows viewers to watch the engine rotate while the LED lights flash. The museum guest will be better informed of the basic workings of the radial engine.

11. **The Effect of Music Perception as Defined by Culture.** Mollie Baker and Jeremy Titsworth (Dr. Sophia Lee) Department of Music

This paper is an exploration of perception and music. We are investigating the correlation between musical perception and background. The specific ideas that we will investigate will be to see if the perception of a singular piece of music is effected by a persons cultural back ground and to see if the perception of a singular piece of music is universal. We will do this through a series of surveys and through a experimental investigation involving from Southwestern Oklahoma State University.

12. **National Foundation for Abused and Neglected Children.** Philip Kitchen (Dr. Philip Holley) Department of Social Sciences

The purpose of the National Foundation for Abused and Neglected Children (NAFNC) is to help children under the age of 18 live full, healthy lives. This foundation was started in 1992. The NFANC is all about raising awareness of child neglect and abuse. The foundation has programs, courses, seminars, posters, etc., all to help further educate citizens on abuse and neglect in the home. The NFANC purpose is to protect the child from abusive and neglected situations, but at the same time they care about the meaning of family and aren't looking to break up families.

13. **Cyberbullying: New Response to an Old Phenomenon.** Wendy Billington (Dr. Philip Holley) Department of Social Sciences

Cyberbullying has been described as an epidemic among US teenagers that is quickly spreading to younger children. It involves the use of the internet and various other forms of electronic communication to execute the tasks of the traditional bully, which makes it harder to identify the tormenter. Many schools and organizations have proposed methods to prevent cyberbullying and several states have passed law addressing the issue. Such a response begs the question as to whether or not legal action is warranted, as well as what definitions are being implemented to draw the conclusion that cyberbullying is any more than an age old experience serving as a rite of passage for American youth.

14. **Murder Victims' Families for Reconciliation.** Robert Roller (Dr. Philip Holley) Department of Social Sciences

Murder Victims' Families for Reconciliation (MVFR) members have lost family members either to murder or to the death penalty. MVFR members oppose the death penalty and work to promote a non-violent society. MVFR's mission is to help neighbors, the press, and policy makers understand the negative impact that capital punishment has on the families of the victims and the condemned.

15. **Strong Mothers against Child Molesters (SMACM): Protecting Innocent Children.** Marisela Hernandez (Dr. Philip Holley) Department of Social Sciences

Strong Mothers against Child Molesters (SMACM) allows people to deal with child molesters. It tells citizens what they can do in case of molestation. It gives them facts about SMACM and provides lists of registered offenders. It also suggests that if a child has been molested it should be reported immediately to the police. Their goal is to help and support parents with children that have been molested. It provides information on how to be more cautious and how to keep children safe.

16. **Strengthen Our Sisters "Breaking the Cycle of Domestic Violence, Poverty, and Abuse."** Diana Leon (Dr. Philip Holley) Department of Social Sciences

Strengthen Our Sisters (S.O.S) mission is "dedicated to breaking the cycle of domestic violence, poverty, and abuse by restoring balance and harmony through individual empowerment." S.O.S provides several services including food, shelter, clothing, legal and supportive services, child care and job training for those women and their children who have been abused and are homeless. S.O.S accepts all kinds of help from volunteers, from helping out and spending time with the children to providing support to the adults and the children who have been in difficult abusive situations in their own home. S.O.S focuses on assisting their clients with legal advice to help them learn to stand on their own.

17. **NVCAN: Victim's Rights Education Project.** Tye Meyer (Dr. Philip Holley) Department of Social Sciences

This project explores the VREP that is operated by the National Victims' Constitutional Amendment Network. The project explores the VREP's main objectives, guidebook, and toolkit, and how these things contribute to the movement toward victims' rights. The program's mission, among other things, is to provide crime victims and others with basic information relevant to implementing victims' core rights, and basic, easy to understand information about their rights and roles within the criminal justice community.

18. **Battling Drunk Driving.** Kenzie Skinner (Dr. Philip Holley) Department of Social Sciences

MADD was established in 1980 as Mothers Against Drunk Drivers. The name was changed in 1984 to Mothers Against Drunk Driving. They wanted to make clear they were not targeting individuals, but the crime of driving under the influence. The organization's primary focuses are on underage drinking, drunk driving and assisting those who are victims of drunk driving. The results of the program will be presented along with what the program does to help prevent drunk driving and underage drinking.

19. **National Alliance for Drug Endangered Children: Helping Substance Abuse Victims.** Heather Wright (Dr. Philip Holley) Department of Social Sciences

When children are exposed to illegal substances, it negatively affects their lives. Many of them have burns from exploding meth labs, physical or sexual abuse, or they may have been neglected. The National Alliance for Drug Endangered Children was started in 2003 to raise public awareness of the effects illegal drugs have on children. The organization is compiled of professionals and experts that offer training and information for those providing for the children. The mission of the National Alliance for Drug Endangered Children is to defend, shelter and support children whose lives have been devastated by illegal drugs.

20. **Missing Children and the Klaas Kids Foundation.** Brittani S. Ogle (Dr. Philip Holley) Department of Social Sciences

An estimated 2,300 children are missing every day in the United States. These children are victims of family or stranger abductions. The Klaas Kids Foundation mission is to help missing children, in the name of the Mark Klaas's daughter who went missing and was murdered. The Klaas Kids Foundation's mission is to help prevent this tragedy from happening to other families, and to help the children who are missing return home safely. The Klaas Kids Foundation advocates legislation and victims rights that protect children and all other victims of violent crime.

21. **Cystic Fibrosis Foundation: Seeking A Cure.** Tammie Moss (Dr. Philip Holley)
Department of Social Sciences

The Cystic Fibrosis Foundation is a non-profit organization established in 1955. It was established to provide a means to a cure for Cystic Fibrosis. In 1989, Cystic Fibrosis Foundation scientists discovered the gene responsible for Cystic Fibrosis, and since its inception, the Cystic Fibrosis Foundation has continued to improve the quality of life for those with Cystic Fibrosis through scientific research, the discovery of new treatments and drugs, the establishment of specialty pharmacies, and the funding of Cystic Fibrosis Care Centers. Annually, the Cystic Fibrosis Foundation sponsors fund-raising walks which contribute millions of dollars each year for continued research.

22. **Breaking the Chains of Abuse.** Staci Masquelier (Dr. Philip Holley) Department
of Social Sciences

Bikers Against Child Abuse Inc. (BACA) is an organization that is dedicated to helping abused children feel safer. BACA began in 1995 in Utah, with the hopes of helping just one child. Their first rally had twenty-seven bikes and from then it grew into a nationwide organization. BACA is a publicly funded organization. They take donations, exchange items or use their own personal monies to help the cause. Their mission statement is basically to be a support to children who feel they have no say in this world, to protect them from any other harm at any cost, and to work with local agencies that are already in place. They receive referrals from local agencies who feel children are in danger. BACA reaches out to these children by giving them a way to contact members. BACA then begins their work on rehabilitating the child. They have a four step intervention program which sometimes includes going to court with the child.

23. **Women Against Domestic Violence.** Glynn Cobb (Dr. Philip Holley)
Department of Social Sciences

Women Against Domestic Violence (WADV) is an online support organization. Women who want to stop the violence in homes across the world created this organization. This group claims to have helped many women leave abusive situations. This group also helps teenagers who have grown up in abusive homes. This website helps women learn about what abuse is and ways to protect themselves. It also explains very important information to them, such as information about restraining orders. It also tells people who are not victims how they can help women and children who are the victims of domestic abuse.

24. **Safe Horizon: Helping Victims of Violence.** DonNell Myers (Dr. Philip Holley)
Department of Social Sciences

Safe Horizon is an organization for victims of violence. This organization deals with domestic violence, rape, stalking, and it also tries to make schools safer for children. In 1991 Safe Horizon created the Domestic Violence Law Project which helps low income women who have been battered get better representation. They also have a plan called the Safe Harbor model which is a place where students can speak with a counselor and develop strategies to avoid violence in the school and in the home. Safe Horizon also provides a shelter for more than 2,000 women and children to escape a violent home. In addition, they also offer many programs for the women including high school equivalency classes, Job Readiness Program, career planning and interview skills, and many more. This organizations is funded mainly by donations.

25. **Mothers Against Drunk Driving: Keeping Alcohol Away from Minors and off the Streets.** Chris Hansen (Dr. Philip Holley) Department of Social Sciences

Mothers Against Drunk Driving (MADD) is an organization whose mission is to lend aid to victims of crimes committed by people driving under the influence of drugs or alcohol, and to aid the families of their victims. Also, MADD has set out to increase public awareness of the growing problem of drunk driving. MADD was officially formed under the name Mothers Against Drunk Drivers on September 5, 1980. In 1984, MADD changed the word "Drivers" in their title to "Driving" because they wanted to more accurately portray their goal. MADD is not against the individual, but against the actual act of driving under the influence. By 1999, MADD had expanded their work from centering on drunk driving to including other acts of illegal alcohol use such as underage drinking. By doing this, they gained more support from the government and other major social entities. Also, in 1999 the mission statement was officially changed to read, "The mission of Mothers Against Drunk Driving is to stop drunk driving, support the victims of this violent crime and prevent underage drinking."

26. **Public Perception of Prison Programs.** Kenzie Skinner (Ms. Donna Barlow)
Department of Social Sciences

This study will explore the public's perception of programs offered to inmates in prisons.

27. **Can I Be Me? Character Selection in Video Games.** Kelly Groves, Georgia Miller, Kari Watkins, Whitney Kistler, and Rachel Rowe (Dr. Stephen Burgess) Department of Psychology

The potential of video game exposure to create and shape stereotypes of other groups as well as opinions of the self is now receiving research attention. Recent content analyses have indicated video game covers and advertisements almost exclusively portray women and ethnic minorities in limited stereotypical roles (e.g., Burgess et al., 2007). These numbers are especially striking given that ethnic minorities spend more hours per day playing video games than Caucasians (Neilsen, 2005) and that women comprise over 40% of game players. Previous research has examined the portrayal of characters in different video games. Some newer games and online communities (e.g., SIMS, Second Life) permit the player to create or choose from a variety of characters. In the present study, we examined the player's opportunity to select or create the character they played. We hypothesized that the opportunity to select or create a character like themselves or within their minority group available to women and ethnic minorities would be very limited. The opportunity to choose the ethnic group of characters was very limited. Players were only permitted to select or create ethnic minority characters in a few sports games and role playing games (e.g., SIMS). The vast majority of the character choices were Caucasian. These patterns were consistent across game ratings.

28. **Do Sexy Video Game Characters Change Male's Perception of Attractiveness?** Georgia Miller, Kelly Groves, Kari Watkins, Whitney Kistler, and Rachel Rowe (Dr. Melinda Burgess) Department of Psychology

Video games often portray women as comic book sexualized statuesque figures. The effect of exposure to these images on the perception of female attractiveness by young adult males has not been examined. Video game playing experience is typically extensive in this age group. We hypothesized that when males played a video game that portrayed females in sexy garb and with a sexy, statuesque body type, they would rate women with sexier body types as more attractive.

29. **The Teotihuacan.** Joel Kardokus (Ms. Linda Hertzler-Crum) Department of Language and Literature

With a population of nearly a quarter million in its height in the sixth century, the Ancient city of Teotihuacan was a Mesoamerican super power extending its influence through the whole of central Mexico. The city was located in what is now the arid San Juan Teotihuacan municipality in the Nation of Mexico (Sugiyama). The civilization had many accomplishments including the first major "complete" city in the new world and a very advanced grid pattern with a central street, named the avenue of the dead by the Aztecs. All set up by astrological calculations on a grid pattern without the use of GPS guided satellites and computers, very impressive for a civilization that existed twenty centuries ago. The people there flourished for more than millennia. Little today is known about how the civilization ended. It is suspected that a major drought caused political turmoil within the governing class. However the violence of the end of the civilization end is undisputable. Black char still stains the stones of many of the apartments, temples and palaces of the civilization showing in great detail how the power of Teotihuacan was turned inward on itself.

30. **Non-Viral Gene Delivery to the Retina with Compacted-DNA Nanoparticles.** Joel Kardokus (Dr. Muna I. Naash†) Department of Chemistry and Physics; INBRE Summer Undergraduate Research Program at the Department of Cell Biology, The University of Health Sciences Center†

Objective: The goal of this project is to test the ability of two compacted-DNA nanoparticles to transfect the developing and mature mouse retina and to compare the localization and expression levels of the transferred gene in the eye over time. The long term goal is to use the data from the two vectors to develop a non-viral gene therapy that can be used for gene supplementation in humans with inherited retinal diseases. Methods: Our compacted-DNA nanoparticles (VMD2-EGFP and CMV-EGFP) are between 8-20 nm in diameter and contain a single molecule of plasmid DNA. We have chosen to use a plasmid vector with the EGFP reporter gene and either the CMV (ubiquitous) or VMD2 (retinal pigment epithelium specific) promoter. One eye was injected at either postnatal day 5 or 30 with nanoparticles, saline, or naked plasmid DNA, while the control eye was left uninjected. Eyes were collected at post injection days 2, 7, and 15 to observe differences in expression levels and localization. Gene expression levels were measured by qRT-PCR. Localization was investigated through immunofluorescence microscopy. Results: At P5 injections, high level of EGFP expression was seen after 2 days in all ocular cells with CMV-EGFP vector and was silenced by 7 days. Unexpectedly, VMD2-EGFP vector drove expression in both photoreceptor cells and RPE cells after P5 and P30 injections. No EGFP immunofluorescence was detected in saline or naked DNA injected eyes. Conclusion: Significant EGFP expression was detected by qRT-PCR and immunofluorescence in juvenile and adult mouse eyes injected with compacted DNA nanoparticles. This work suggests that nanoparticles may be excellent vectors for the delivery of therapeutic genes to patients affected by inherited retinal degenerations.

31. **Differential Pulse Anodic Stripping Voltammetry (DPASV) for the Detection of Barium and Lead from gunshot Residue (GSR).** Matt Williams, Brooke Shockey, Tanner Buffington, Ross Lane, and Anthony Allison (Dr. Curt Woolever) Department of Chemistry and Physics

Differential pulse anodic stripping voltammetry (DPASV) has been applied for characterization and quantitative detection of barium and lead from gunshot residue (GSR). Previous electrochemical techniques have detected antimony and lead from GSR, however barium has never been detected. This technique allows for simultaneous detection of barium and lead that is simple, fast, and nondestructive.

32. **Dichloro (4,11-dimethyl -1,4,8,11- tetraazabicyclo [6.6.2] hexadecane) iron(III) hexafluorophosphate.** Neil L. Funwie (Dr. Timothy J. Hubin) Department of Chemistry and Physics

Dichloro(4,11-dimethyl-1,4,8,11-tetraazabicyclo[6.6.2]hexadecane) iron(III) hexafluorophosphate is the first mononuclear Fe(III) complex of an ethylene cross-bridged cyclam to be structurally characterized. Comparison with the mononuclear Fe(II) complex of the same ligand shows that the smaller Fe(III) ion is more fully engulfed by the cavity of the bicyclic ligand. Comparison with the oxo-bridged dinuclear complex of an unsubstituted ligand of the same size demonstrates that the methyl groups of 4,11-dimethyl-1,4,8,11-tetraazabicyclo[6.6.2]hexadecane prevent dimerization upon oxidation, while the unsubstituted ligand allows dimerization to occur. Nax-Fe(III)-Nax bond angles, and thus the degree of encapsulation by the ligand, are quite different between the mononuclear and dinuclear oxo-bridged species, which is likely the consequence of steric considerations.

33. **Diaqua(4,11-dimethyl-1,4,8,11-tetraazabicyclo [6.6.2] hexadecane) nickel (II) chloride.** Amy Cain (Dr. Timothy J. Hubin) Department of Chemistry and Physics

The title compound is a mononuclear Ni(II) complex of an ethylene cross-bridged tetraazamacrocyclic ligand that has been structurally characterized. Unique to this complex is its coordination of water in preference to chloride at the non-macrocyclic coordination sites. Numerous examples of M(II) complexes with this ligand have chloride bound, whereas this complex prefers aqua ligands. The diaqua dication's charge is balanced by two chloride anions that form a hydrogen bonding chain with the aquo ligands; one chloride bridges both water ligands of the same complex through hydrogen bonds, while the other bridges a single water ligand of two complexes intermolecularly.

34. **Dichloro(4,10-dimethyl-1,4,7,10- tetraazabicyclo [5.5.2] tetradecane) manganese (III) Hexafluorophosphate.** Cammi Valdez (Dr. Timothy J. Hubin) Department of Chemistry and Physics

The title compound is a Mn(III) complex originally synthesized to test its potential as an oxidation catalyst. Characterization of the complex, especially cyclic voltammetry indicating stability at three different oxidation states [Mn(II), Mn(III), and Mn(IV)], indicates that the stability needed to act as a catalyst is present. This data, along with the X-ray crystal structure of this complex will be presented.

35. **Dichloro (4,10-dimethyl-1,4,7,10-tetraazabicyclo [5.5.2] tetradecane) nickel (II).** Travis Roberts (Dr. Timothy J. Hubin) Department of Chemistry and Physics

The title complex has been synthesized according to a literature procedure, and structurally characterized for the first time. Like most of its M(II) analogues with cross-bridged tetraazamacrocycles, the metal binds two chloro ligands in addition to the macrocycle (based on cyclen in this case). This differs from the Ni(II) complex of the related ligand where the macrocycle is based on cyclam, which has coordinated water and hydrogen bonded chloride counter ions. Spectroscopic characterization, in addition to the X-ray crystal structure, will be presented.

36. **Dichloro (4,11-dimethyl-1,4,8,11-tetraazabicyclo [6.6.2]hexadecane) cobalt(III) hexafluorophosphate.** Serena Hageman (Dr. Timothy J. Hubin) Department of Chemistry and Physics

The title compound is a Co(III) complex originally synthesized to test its potential as an oxidation catalyst. Characterization of the complex, especially ligand field strength calculated from the electronic spectrum, provides insight into the properties of cross-bridged tetraazamacrocycles. This data, along with the X-ray crystal structure of this complex will be presented.

37. **A Pathway Screen: Identifying Natural Product Extracts that Target the Rho Pathway.** Cammie Valdez (Dr. Ulrike Eggert†) Chemistry and Physics; SHURP Summer Undergraduate Research Program at the Department of Biological Chemistry and Molecular Pharmacology, Harvard Medical School†

Rho GTPases regulate diverse cellular processes, including cytokinesis, the final step in cell division. Cytokinesis occurs very rapidly only after the DNA has separated during mitosis. The underlying mechanisms by which Rho GTPases coordinate cleavage furrow formation, ingression, and cytokinesis completion remain poorly characterized. We developed a phenotypic screen that uses chemical genetics and partial inhibition of Rho to identify Rho pathway-specific small molecules. This approach is analogous to a classical modifier screen, but cells are perturbed by chemicals rather than mutations. Rho inhibition results in binucleate cells, which is a consequence of failed cytokinesis. A screen of 40,000 small molecules and natural product extracts in *Drosophila* Kc167 found natural product extracts that either enhanced or suppressed the number of binucleate cells compared to control cells. I screened 3,500 natural product extracts in human HeLa cells as a secondary assay to identify the most interesting small molecules. During the development of my image based screen, an intermediate Rho Inhibitor phenotype was acquired that would produce both the enhancement of binucleate cells and a slightly disrupted actin phenotype. The cell permeable Rho Inhibitor, C3 Exoenzyme, causes the partial inhibition of Rho, which sensitizes the cells to small molecule treatment. Natural product extracts that target the Rho pathway were identified using automated microscopy and visual analysis. Natural product extracts that enhanced the level of binucleate cells were identified. Misregulation of the Rho pathway has been implicated in many types of cancers. Therefore, Rho pathway-specific small molecules have promising therapeutic potential.

38. **Flex-Hets Demonstrate Mixed Inhibition of NADH : Ubiquinone Oxidoreductase in Bovine Heart Muscle Sub-Mitochondrial Particles.** David Supeck and Cammie Valdez (Dr. William J. Kelly) Department of Chemistry and Physics

Flexible heteroarotinoids (flex-hets), a novel class of retinoid anti-cancer drug, induce apoptosis in multiple types of cancer cells. The lead flex-het, SHetA2, is a powerful inhibitor of oxygen consumption in actively respiring mitochondria isolated from A2780 ovarian cancer cells. The effect of the drug on mitochondrial function was assessed using sub-mitochondrial particles (SMP's) isolated from bovine heart muscle. NADH oxidase activity in the absence of ubiquinone was assayed spectrophotometrically, using the decrease in absorbance of NADH at 340nm. Treatment with varying concentrations of SHeta2 inhibited NADH oxidase activity in a dose dependent fashion. Full Complex I activity, assessed in the presence of added ubiquinone analog UQ1, was also inhibited by addition of drug. Preliminary steady state kinetic analysis suggests that flex-hets are mixed inhibitors of Complex I. The apparent maximum velocity (V_{max}') is decreased and the Michaelis-Menten constant (K_m') is increased on treatment with flex-het drug.

39. **A Rapid Assay of Flexible-Heteroarotinoid Drugs for Potential Anti-Cancer Activity.** Antonette D. Smith (Dr. William J. Kelly) Department of Chemistry and Physics

A group of Oklahoma researchers have discovered a new class of anticancer drug called Flex-Hets (for flexible heteroarotinoid). These drugs are related to the class of natural vitamins called retinoids (similar to Vitamin A) but have had their chemical structure modified to reduce toxicity and other negative effects. The Flex-Hets will kill several different types of cancer cells (melanoma, ovarian and brain) but have no effect on normal cells. Work has shown that one of the Flex-Hets, SHetA2, is able to inhibit mitochondrial respiration in mitochondria isolated from human ovarian cancer cells. Other results show that SHetA2 inhibits the electron-transport enzyme Complex I located in the inner mitochondrial membrane. Since Complex I is the initial enzyme in the respiratory chain, if its activity is reduced than all of mitochondrial respiration is affected, which could lead to cell death. SHetA2 is the "lead compound" of a series of structurally related compounds. It has been extensively studied over the last five years. However, other Flex-Het compounds have not been examined as closely because the primary test for anti-cancer activity involves the growth of cancer cells by tissue cultures and a very expensive experimental determination of cell death using fluorescent flow cytometry techniques. Complex I inhibition can be used as a "marker" for potential anti-cancer activity. We have examined the Complex I inhibitor activity of a series of alternate Flex-Het compounds as well as several natural retinoids to prescreen these compounds for potential anti-cancer activity.

40. **Synthesis and Characterization of Rhenium(V) Alkylimido Complexes.** Terri Schimmel and Sarah Webb (Dr. David Esjornson) Department of Chemistry and Physics

The alkyl alpha-hydrogens of the alkylimido rhenium(V) compounds of the type $\text{ReCl}_3(\text{NCH}_2\text{R})(\text{L})_2$ (where $(\text{L})_2$ represents two monodentate or one bidentate phosphine ligands and $\text{R} = \text{H}, \text{CH}_3, \text{CH}_2\text{CH}_3$) have long been recognized as somewhat unusual. These proton resonances appear significantly upfield of other similar compounds, and are out of the range usually encountered for "normal" alkyl resonances. All of the complexes of $\text{ReCl}_3(\text{NCH}_2\text{R})(\text{L})_2$ for which nmr data is available have phenyl groups in the L ligands. These phenyl groups have been shown to significantly contribute to the upfield chemical shifts observed for these compounds. There are several L ligands which do not contain phenyl rings, and derivatives of the rhenium complexes with these ligands can be synthesized. The synthesis of several derivatives of $\text{ReX}_3(\text{NCH}_3)(\text{PR}_3)_2$ (where $\text{X} = \text{Cl}$ or Br , and $\text{R} = -\text{CH}_3, -\text{CH}_2\text{CH}_3, -\text{C}_6\text{H}_{11}$) has been attempted. Characterization of these complexes should reveal whether these types of compounds will still exhibit upfield resonances in the absence of any phenyl ring anisotropic effect. Since this class of compound was characterized during the early years of nmr spectroscopy, the other nuclei present represent a new avenue of exploration. Additionally, there is an opportunity to characterize these complexes with Mass Spectrometry, Cyclic Voltametry and other instrumental methods that were not widely available when this class of compounds was first synthesized. Student Involvement: A single research student working supervised will prepare the target compounds, and run the appropriate analyses.

41. **Differential Dynamic Response of ATP-Grasp Domains within Carbamoyl Phosphate Synthetase.** Serena Hageman (Dr. Jason L Johnson) Department of Chemistry and Physics

Carbamoyl phosphate synthetase (CPS) catalyzes the production of carbamoyl phosphate for assimilation into either arginine or the various pyrimidines. The enzyme is a heterodimer, with gene duplication giving rise to two ATP binding domains that are separated by over 40Å, have 40% sequence identity, and exhibit strong structural overlap. During the catalytic mechanism of CPS, the ATP-binding domains act in tandem, but promote different reactions and respond to unique allosteric signals. At the N-terminal domain, one equivalent of ATP reacts with bicarbonate to generate carboxyphosphate, signaling the hydrolysis of glutamine and release of ammonia from the small subunit. Attack by ammonia on carboxyphosphate generates carbamate, which then tunnels into the C-terminal domain to react with a second equivalent of ATP and produce carbamoyl phosphate. Separate binding sites also exist for the allosteric activator ornithine and inhibitor UMP, each impacting nucleotide affinity and turnover uniquely at the two ATP active sites. How the conformations of the two ATP-grasp domains differentially respond to such synchronizing and regulatory signals has to this point been unknown. Here, we introduce tryptophan probes into parallel positions within the two active sites and report their unique steady-state and time-resolved fluorescence response to the binding of substrates, products, and regulators. Supported by INBRE Grant # P20RR016478-04.

42. **Engineering Probes to Assess Synchronization Mechanisms in Amidotransferase-Containing Proteins.** Garrett Scott and Candace Benda (Dr. Jason L Johnson) Department of Chemistry and Physics.

The glutamine amidotransferase (GATase) family of biosynthetic enzymes shares in common the ability to catalyze the coordinated removal of ammonia from glutamine and subsequent transfer to a substrate to form a new carbon-nitrogen group. Exemplifying these proteins is carbamoyl phosphate synthetase—it coordinates five substrates and three intermediates between three active sites that are inter-connected via 100Å of tunnels to produce carbamoyl phosphate. The reaction of ATP and bicarbonate within the first active site of the large subunit represents the rate-limiting step and the stimulus for an inter-subunit, allosteric signal promoting glutamine hydrolysis in the small subunit. The conformational changes accompanying carboxyphosphate formation at the nucleotide binding site, as well as the allosteric response manifested within the amidotransferase domain, have thus far escaped experimental characterization. In this study, we have engineered via site-directed mutagenesis a series of nine fluorescence probes potentially sensitive to these synchronizing movements. Specifically, we have substituted tryptophan for various hydrophobic amino acids in structural elements around the ATP binding and the GATase domains purportedly involved in active site coordination. In future studies, ligand-induced changes in the fluorescence properties of these probes will highlight dynamic motions correlated with synchronization signals. Supported by INBRE Grant #P20RR016478-04.

43. **Evaluation of Parasite Load in Hair-Type, Wool-Type, and Crossbred Lambs Grazing Wheat Pasture.** Adam Hughes, Gaurav Poudyal, Jason Peace, Chris Tuma, and Carneli Jorge-Torres (Dr. Lisa Appeddu and Dr. Mike Brown†) School of Allied Health, in collaboration with the USDA-ARS Grazinglands Research Lab†, El Reno, OK

Small animals, such as lambs and goats, offer management alternatives to Oklahoma producers who traditionally graze cattle on wheat pasture. However, to be profitable, producers need to know which breeds of animals will remain healthy and yield the most product (meat, hair, wool) for the amount of dollar and labor input they provide. In response to this need, our research evaluated the effects of breed type on parasite load and weight gain in lambs grazing wheat pasture. In Spring 2007, fall-born lambs grazed wheat pasture with (n=5) or without (n=5) being fed a corn supplement. Lamb breeds were purebred St. Croix (hair-type; n=3), Dorset (wool-type; n=3), and crosses of these two breeds (n=4). Fecal and blood samples were collected and animals weighed on Feb. 16, Mar. 9, Mar. 30, and April 20, 2007. A sugar flotation technique was used to evaluate parasite load, by counting the number of coccidian oocysts (*Eimeria*) and stomach worm eggs (*Haemonchus*, *Ostertagia*, *Trichostrongylus*) in feces. To more objectively evaluate parasite impact on health, blood samples were evaluated for red blood cell percentage (RBC%) and total protein. Breed type affected both oocyst and egg counts, such that wool-type lambs had higher parasite loads as compared to hair-type and crossbred lambs. Lambs supplemented with corn had higher egg counts than unsupplemented lambs. However, animal gain, RBC%, and total serum protein were not impacted by parasite load in this study. Results suggest the close contact of daily supplementation with corn may increase lamb exposure to parasites, and that using hair-type breeds may decrease parasite load in grazing lambs. Future research will continue to evaluate these trends in animal health and production.

44. **Using Indigestible Neutral Detergent Fiber and Acid Detergent Fiber to Estimate Digestibility in Steers Fed Wheat.** Jason Peace (Dr. Lisa Appeddu and Dr. Mike Brown†) School of Allied Health, in collaboration with the USDA-ARS Grazinglands Research Lab†, El Reno, OK

This research evaluated indigestible neutral detergent fiber (iNDF) and acid detergent fiber (iADF) as internal markers to estimate digestibility in cattle grazing wheat. Samples were taken from four steers offered wheat silage and fed a corn supplement. Total feed intake and fecal output were determined to calculate true dry matter (DM) digestibility. Percentage iNDF and iADF were determined from feed and fecal samples incubated in digestive fluid *in vitro* for 96 h, followed by conducting respective fiber analyses on the residue. Another set of samples was also incubated in an acid-pepsin solution for 48 h between the digestive fluid incubation and fiber analysis steps (iNDF+AP and iADF+AP). Higher ($P < 0.001$) marker contents were found in feed and feces samples after conducting iNDF and iNDF+AP as compared to iADF and iADF+AP, but AP had no effect ($P > 0.58$). DM digestibility was estimated from marker contents by taking $100\% - 100 \times (\text{marker content of wheat} / \text{marker content of feces})$; no differences ($P > 0.52$) were found among method of analyses. Estimated DM digestibility was different ($P = 0.01$) from the actual calculation ($55.0 \pm 3.93\%$ vs $64.3 \pm 2.21\%$). Amount iNDF ($P = 0.13$) and iADF ($P = 0.17$) recovered in feces tended to be lower than amounts consumed. Results suggest the fiber-based markers tested may not be fully indigestible under conditions employed; therefore, a longer digestive fluid incubation may be necessary if it can be maintained *in vitro*.

45. **Growth Sensitivity of Four Species of Mat-Forming Filamentous Algae to UV Radiation.** Alyssa Cannon, Holley Ladymon, Savannah Powell, Jessica Redd, and Immanuel Suleiman (Dr. Steven W. O'Neal) Department of Biological Sciences

Filamentous algae often form floating mats on the surface of lakes and ponds where they are exposed to maximum levels of visible and UV radiation from the sun. This growth habit suggests that these algae are tolerant of high levels of solar radiation. This study examined four species of filamentous algae (Mougeotia, Pithophora, Spirogyra, and Zygnema) to determine whether species differences exist in UV tolerance and whether UV tolerance is affected by prior acclimation to high or low visible light levels. Experimental mats of the algae were grown at low ($15 \mu\text{moles} \times \text{m}^{-2} \times \text{s}^{-1}$) and high ($150 \mu\text{moles} \times \text{m}^{-2} \times \text{s}^{-1}$) levels of visible light. Initial biomass and chlorophyll-a content were determined after 7 days of growth. The mats were then exposed to either UV radiation ($18 \mu\text{W} \times \text{cm}^{-2}$) or control conditions ($0 \mu\text{W} \times \text{cm}^{-2}$ UV) for 7 days. After exposure the UV treated and control mats were evaluated for growth rate (biomass increase) and chlorophyll-a content. Effects of UV exposure were also evaluated by visual inspection of the mats. Mats of Mougeotia and Zygnema pre-acclimated to low levels of visible light were more sensitive to UV exposure than mats of Pithophora or Spirogyra. UV induced symptoms included chlorosis and reduction in growth rate. Pre-acclimation to high levels of visible light reduced the negative effects of subsequent UV exposure for both Mougeotia and Zygnema. Differences between low-light and high-light acclimated mats were most dramatic for Zygnema.

46. **The Effects of Flooding on the Crowder Lake Ecosystem.** Alyssa Cannon, Holley Ladymon, Savannah Powell, Jessica Redd, and Immanuel Suleiman (Dr. Steven W. O'Neal) Department of Biological Sciences

Oklahoma experienced its wettest June on record in 2007. Heavy and persistent rains during the spring and early summer produced stream flooding and rapidly rising lake levels across Oklahoma. The goal of this study was to determine how the rapid input of large quantities of runoff affected limnological conditions and phytoplankton in Crowder Lake, a 158-acre reservoir on Cobb Creek in Washita County. Four sites, representing riverine and lacustrine regions, were sampled on July 18 & July 25, 2007. Water samples collected from a depth of 0.5m were processed for chlorophyll-a, pH, conductivity, turbidity, ammonia, nitrate, soluble iron, total phosphorus. Water temperature, dissolved oxygen, and Secchi depth were also measured at the sites. Depth profiles of water temperature and dissolved O₂ were run at the deepest site located near the dam. Parameters measured were compared with similar measurements made in the summer of 2001. Concentrations of chlorophyll-a and nitrate were significantly higher in 2007 compared to 2001. Secchi depths indicated higher turbidity in 2007. At the deep site, dissolved O₂ dropped to near zero at a depth of 2-3 meters compared to 7-8 meters in previous years. Results suggest that heavy runoff had a significant effect on the reservoir system. Anoxic lake sediments may have been mixed into the water column reducing O₂ levels, increasing nitrogen levels and stimulating phytoplankton growth.

47. **Campus Tree Map.** Kelsey B. Zybach (Dr. Bill Seibert) Department of Biological Sciences

An updated map of the SWOSU campus at Weatherford shows the physical structures and all the trees. The trees are identified and located. Memorial trees are also identified.

48. **Comparison of the Plant Species in Two National Wildlife Refuges.** Levi Feltman (Dr. Bill Seibert) Department of Biological Sciences

The species composition of The Washita National Wildlife Refuge, Butler, OK, has been compared to the species of the Optima National Wildlife Refuge, Hardesty, OK.

49. **Cloning of the Novel Transporter BOCT1.** Kelly Fine (Dr. James Stollt) Department of Biological Sciences; Summer Undergraduate Research Program within Texas Tech School of Pharmacy†

BOCT1 and BOCT2 are novel transporters that are part of the Organic Cation Transporter (OCT) family. OCT's transport a wide variety of positively charged organic substrates including many drugs. BOCT1 has not been well characterized and the function of BOCT 2 is unknown. By recombinant expression of those genes in cells, their function can be examined. The expression vector of choice is pcDNA 4/TO, a tetracycline inducible plasmid. pcDNA clones of BOCT2 and the characterized transporters OCT1 and OCTN2 were previously constructed. A pcDNA clone of BOCT1 was needed. In this project the BOCT1 FLAG DNA sequence was cloned into the tetracycline inducible expression vector pcDNA 4/TO. The results showed that the optimum concentration of Zeocin for HEK transfections is 200 µg/mL. BOCT1, BOCT2, OCT1, and OCTN2 pcDNA 4/TO constructs were transfected into HEK 293 cell line.

50. **Genetic Testing for Mutations in the Tumor Suppressing Genes BRCA1 and BRCA2.** Matthew Cole and Joshua Postin (Dr. Muatasem Ubeidat) Department of Biological Sciences

Cancer is a disease in which cells begin to grow rapidly and out of control. Breast cancer forms in tissues (usually the ducts and lobules) of the breast. The most common breast cancer susceptibility genes identified to date are BRCA1 and BRCA2 genes. The BRCA1 gene is found on the long arm of the 17th chromosome at band 21, while the BRCA2 gene is found on the long arm of the 13th chromosome at band 12.3. The BRCA1 and BRCA2 genes code for large negatively charge proteins called the BRCA1 and BRCA2 proteins, respectively. Mutations in these proteins can predispose and increase the risk of breast cancer in women. Individuals who carry mutations in the BRCA1 and 2 genes are about 87% more likely to suffer from breast cancer. BRCA mutation carriers can decrease their risk of cancer by surveillance strategies. Mutations in BRCA1 and 2 genes can be detected by a procedure known as BRCA analysis. This procedure allows women that are conscious of having breast cancer to be tested for mutations in these genes. In this procedure blood is obtained from the individual; next DNA will be extracted from the white blood cells. The DNA is then subjected to a polymerase chain reaction to amplify it. The amplified DNA is then directly sequenced in both forward and reverse directions using sequence primers that are fluorescent dye-labeled. Chromatographic tracings of each amplicon are then analyzed by a proprietary computer-based review and also by visual inspection for conformation. Mutations are detected by comparing the sample to the consensus wild-type. All regions with possible genetic mutations are then repeatedly run through PCR to amplify and confirm that a mutation exists.

51. **Genetic Modification of Switchgrass to Increase the Production of Biofuel.**
Susannah Farris and Grace Anne Fath (Dr. Muatasem Ubeidat) Department of Biological Sciences

Switchgrass (*Panicum virgatum*) is a warm season perennial grass that is present in tall grass prairies scattered throughout North America. The reason why Switchgrass is a great candidate for biofuel energy is because of its high yield, its ability to enhance soil and wildlife in an area, and its adaptability to poor soils and marginal croplands, thus making it highly versatile. Switchgrass is easily transformed by *Agrobacterium tumefaciens*, a bacteria that uses horizontal gene transfer to induce tumors in plants (specifically crown-gall disease), and it is a bacteria that naturally invades a damaged plant. The goal for transforming Switchgrass is to produce a transgenic form using C3H, CCONT, and CAD genes inserted in to *Agrobacterium* to reduce lignin content and improve fermentable sugar yields that produce ethanol-based energy. A decrease in lignin will remove the negative impact on cell wall digestion that is essential in converting Switchgrass into an ethanol based fuel. Research of alfalfa shows that a decrease in lignin yields nearly twice the amount of sugar in cell wall as wild-type alfalfa, and new research suggests that it will have the same impact on Switchgrass.

Podium Presentations

52. **The Effectiveness of Music Therapy on The Improvement of Speech Fluency of a Stroke Patient of 25 Years.** Marce Muller (Dr. Sophia Lee) Department of Music 12:30 PM

This study is over a 47 year old male who had a stroke over 25 years ago. He has left-side deficit that left him with speech and physical restrictions. He received speech therapy and physical therapy initially after onset and showed a great amount of improvement. He has adapted life to his disabilities, but will have a great improvement of his quality of life with the implementation of music therapy. He will receive short, intense therapy sessions 3x per week for 2 months.

53. **Storytelling Truth: The History Held by the Myths in James Welch's Fools Crow.** Tara Havins and Steven Giblett (Dr. Viki Craig) Department of Language and Literature 12:50 PM

In various cultures the art of storytelling is like a cherished family heirloom passed down from generation to generation. Numerous Native American traditions use storytelling as a way to share the history of the people. The stories or myths are frequently about people or events long ago that clarify why things function the way they do in the present time. James Welch stitched together a masterpiece titled *Fools Crow* that explores that ancient art of storytelling. It is a perfect blending of the actual tale of the protagonist, White Man's Dog, and the mythology of the Blackfoot people. The legends of the people are so closely woven with the actual contemporary human story that it is difficult to differentiate where one ends and the other begins. Welch anticipates what many current Native American writers are doing with time in their novels, such as LeAnn Howe, Diane Glancy, and Louis Owens. The invocation of the past into the present and the myth-systems, both of these together, reveal history, therefore, "[they explain] the past as well as the future [1]."

[1] Barry, Nora. "A Myth to Be Alive": James Welch's *Fools Crow*. Page 1

54. **Iraq: The Neo-Congo.** Corey Mingura (Dr. Helen Maxson) Department of Language and Literature 1:10 PM

In his presentation, Corey Mingura explores the haunting similarities between Joseph Conrad's 1899 novel *Heart of Darkness* and the current war in Iraq, focusing on the common issues of lying, imperialism, and dehumanization between the two. This seeks to confirm the power and relevance of classic literature in the world of today.

55. **A Memoir Selection From Regina Holsted: A Crash Course in Life.** Regina Holsted (Dr. Viki Craig) Department of Language and Literature 1:30 PM

In February of 1972, Ginger Phelps survived an accident involving a pickup truck and the horse she was riding. Although the impact of the collision threw her off her horse, the force of it caused her left arm to get caught in the slats of the stock trailer pulled by the driver, twisting it off between the elbow and the shoulder. This selection recalls the first two weeks at University Hospital after the initial reimplantation surgery as a thirteen-year-old girl struggles first to live and then adapts to a hospital environment. Through this journey of survival, the girl gains a new life perspective as her eyes open for the first time to both the best and worst of human nature. The author tells this story from her own perspective, introducing the doctor who performed and assisted in her following surgeries, along with other characters that became a part of her life because of the accident. The basis of this project focuses on life writing as it evolves into a medical memoir.

56. **The Renaissance of Native American Literature: The Quest for Justice and Renewal in Angie Debo and N. Scott Momaday's Works.** Shannon Duncan and Loren Gilmore (Dr. Vick Craig) Department of Language and Literature 1:50 PM

Angie Debo was a driving force in uncovering the unjust treatment of Indians during their transition into Indian Territory. In *And Still the Waters Run*, Debo detailed the unjust treatment and reformation of the Native Americans by giving in to government control. N. Scott Momaday awakened the ancient voice within the souls of Native Americans who had been oppressed by the white government. Denied their language, customs, and traditions, many Native Americans were forgetting their roots. Remembering the oral tales passed down from his elders, Momaday wrote *A Way to Rainy Mountain*, a book detailing the journey of the Kiowa people. The book is divided into three sections with three different narratives. The sections recount the beginning, rise, and fall of the great Kiowa Nation. The three chapters have three different voices: mythic, explanatory, and personal. Debo's drive helped many Native Americans get back what was taken from them. Her works have also changed many false points of view about events that took place during the reformation of Indian Territory. N. Scott Momaday and Angie Debo have committed their lives to the Native American communities giving hope, renewal, and the opportunity for fellow artists to tell their stories.

57. **Incidence of Mastitis in Cows Sired by Different Breeds of Bulls.** Terri Quinn, Meagan Pender, Courtney Hedrick, and Carneli Jorge-Torres (Dr. Lisa Appeddu and Dr. Mike Brown†) School of Allied Health, in collaboration with the USDA-ARS Grazinglands Research Lab†, El Reno, OK 2:10 PM

This research was conducted to evaluate the effect of mastitis on beef cow milk yield and calf gain, and to determine if sire breed of the cow impacts the incidence of mastitis. Cattle were a part of a project at the USDA-ARS Grazinglands Research Laboratory in El Reno, OK. Cows milked were the offspring of Brangus cows crossed with Hereford (traditional), Charolais (meat-type), Gelbvieh (dual purpose), Brangus (tropically-adapted), Romosinuano (South American), and Bonsmara (South African) bulls. Milk samples and calf weights were taken in early (May), mid (July), and late (Sept.) lactation. Prior to sampling, cows and calves were separated the night before milking. To induce milk letdown, each cow was given 1.5 ml of acepromazine maleate and 1.0 ml of oxytocin. Cow udders were cleaned with an iodine wash and alcohol swabs prior to collecting samples. Two sterile vials of milk (~ 10 ml) were collected from each quarter and immediately put on ice. Cows were mechanically milked afterwards to determine milk production and to take a composite sample for determination of somatic cell count (SCC). After sampling, 10 µl of milk was taken from each vial and streaked onto blood agar plates for incubation at 37°C. Growth of three or more colonies having the same morphology suggested an intramammary infection. Isolated colonies were tested for Gram reaction, cell morphology, and oxidase and catalase reactions to determine type of microbe present. Commercial kits (API® bioMerieux, Hazelwood, MO) were employed for final identification of bacterial species. Results are currently being analyzed to determine impact of udder health on milk and calf production, and to evaluate genetic susceptibility to infection. Preliminary results will be presented.

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