MISSISSIPPI
ACADEMY OF SCIENCES

SEVENTY-FIFTH ANNUAL MEETING

February 17-18, 2011

University of Southern Mississippi Thad Cochran Convention Center
Hattiesburg, MS

Supported by

University of Southern Mississippi

Journal of the Mississippi Academy of Sciences

Volume 56 January 2011 Number 1

Contents

The Journal of the Mississippi Academy of Sciences (ISSN 0076-9436) is published in January (annual meeting abstracts), April, July, and October, by the Mississippi Academy of Sciences. Members of the Academy receive the journal as part of their regular (non-student) membership. Inquiries regarding subscriptions, availability of back issues, and address changes should be addressed to The Mississippi Academy of Sciences, Post Office Box 55709, Jackson, MS 39296-5709, telephone 601-977-0627, or email msacademyofscience@comcast.net.

OFFICERS OF THE MISSISSIPPI ACADEMY OF SCIENCES

President	Mohamed Elasri
President-Elect	Tina Martin
Immediate Past-President	Shane Burgess
Executive Officer	Hamed A. Benghuzzi
Journal Editor	Michelle Tucci
Directors	Kenneth Butler
	Ibrahim Farah
	Stanley Smith
Administrative Assistant	Barbara Holmes

Division Chairs 2010–2011

AGRICULTURE AND PLANT SCIENCE
Gloria Miller, Jackson State University

CELLULAR, MOLECULAR AND DEVELOP. BIOL.
Sandra Leal, University of Southern Missisippi

CHEMISTRY AND CHEMICAL ENGINEERING
Ramaiayer Venkatraman, Jackson State University

ECOLOGY AND EVOLUTIONARY BIOLOGY
Paul Mack, Mississippi University for Women

GEOLOGY AND GEOGRAPHY
John Banks, MS Department of Environmental Quality

HEALTH SCIENCES
Kenneth Butler, Univ. of Mississippi Medical Center
Stanley Smith, Univ. of Mississippi Medical Center

HISTORY AND PHILOSOPHY OF SCIENCE
Michael Dodge, McGill University

MARINE AND ATMOSPHERIC SCIENCES

MATHEMATICS, COMPUTER SCI. AND STATISTICS
Elgenaid Hamadain, Univ. of Mississippi Medical Center

PHYSICS AND ENGINEERING
James Stephens, University of Southern Missisippi

PSYCHOLOGY AND SOCIAL SCIENCE
Shaila Khan, Tougaloo College

SCIENCE EDUCATION
Jacob Clark Blickenstaff, University of Southern Missisippi

ZOOLOGY AND ENTOMOLOGY
Alex D.W. Acholonu, Alcorn State University

GENERAL SCHEDULE

MISSISSIPPI ACADEMY OF SCIENCE
Seventy-Fifth Annual Meeting
February 17-18, 2011

GENERAL SCHEDULE

WEDNESDAY, FEBRUARY 16, 2011

TIME	EVENT	LOCATION
5:00 PM to 7:00 PM	Board of Directors Meeting	TBA

THURSDAY, FEBRUARY 17, 2011

TIME	EVENT	LOCATION
7:30 AM to 5:00 PM	Registration	Lobby
8:00 AM to 5:00 PM	Exhibits	Second Floor
8:00 AM to 4:00 PM	Divisional Programs	See program for rooms
Noon to 1:00 PM	Special Presentation	TBA
5:15 PM to 6:00 PM	2010 Dodgen Lecture & Presentation of Awards	Third Floor Ballroom I
6:00 PM to 7:00 PM	Reception and Poster Session	Third Floor

FRIDAY, FEBRUARY 18, 2011

TIME	EVENT	LOCATION
7:15 AM to 8:15 AM	Past-Presidents' Breakfast	To Be Announced
8:00 AM to 8:45AM	MAS Business Meeting	Third Floor Ballroom I
8:00 AM to 2:00 PM	Registration	Lobby
8:00 AM to 2:00 PM	Exhibits	Third Floor Ballroom I
8:00 AM to 5:00 PM	Divisional Programs	See program for rooms
9:00 AM to 10:30 AM	Health Fair	Third Floor Ballroom II
Noon to 1:00 PM	Special Presentation	TBA

Driving Directions

Thad Cochran Center
The University of Southern Mississippi
Hattiesburg, Mississippi

Arriving on I-59 from the north or south...

Approaching Hattiesburg from the north or south on I-59, take the Hardy Street exit. Turn east on Hardy Street. Continue on Hardy Street to 38th Avenue. Turn left. Continue to the intersection of 38th Avenue and West 4th Street. Turn right onto West 4th Street. Turn right at the second traffic light onto Golden Eagle Avenue. Take the third left into the Visitor Parking Lot.

Arriving on US Highway 49 from the south...

Approaching Hattiesburg from the south on U.S. Highway 49, turn left onto Hardy Street at the US Highway 49 / Hardy Street intersection. Take an immediate right onto Service Drive. Follow Service Drive (running parallel to Highway 49) to the traffic light at West 4th Street. Turn left onto West 4the Street. Turn left at the first traffic light onto Golden Eagle Avenue. Take the third left into the Visitor Parking Lot.

Arriving on US Highway 49 from the north...

In less than one mile after passing through the I-59 interchange, follow the sign on the right indicating an exit to the Coliseum and 4th Street. Take the West 4th Street exit (green sign on right says Coliseum) and turn left on the service road. Turn right onto West 4th Street. On West 4th Street, turn left at the first traffic light onto Golden Eagle Avenue. Take the third left into the Visitor Parking Lot.

Arriving on US Highway 98 from the west...

Approaching Hattiesburg from the west on U.S. Highway 98, continue straight through the I-59 interchange. This will put you on Hardy Street, the main street which runs in front of the USM campus. Continue on Hardy Street to 38th Avenue. Turn left. Continue to the intersection of 38th Avenue and West 4th Street. Turn right onto W. 4th Street. Turn right at the second red light onto Golden Eagle Avenue. Take the third left into the Visitor Parking Lot.

Meeting will take place on the second and third levels

Sustaining Members

Alcorn State University
Belhaven College
East Central Community College
Holmes Community College
Itawamba Community College
Jackson State University
Mississippi Gulf Coast Community College
Mississippi Museum of Natural Sciences
Mississippi State University
Mississippi Valley State University
Northwest Mississippi Community College
Pearl River Community College
University of Mississippi
University of Mississippi Medical Center
University of Southern Mississippi
William Carey University

LIFE MEMBERS

Junius G. Adams, III, Gaithersburg, MD
Charles C. Alexander, University, MS
Alex D. W. Acholonu, Alcorn State, MS
Vernon L. Asper, Stennis Space Center, MS
Robert Bateman, Hattiesburg, MS
Hamed Benghuzzi, Madison, MS
John D. Bower, Jackson, MS
Carolyn R. Boyle, Starkville, MS
John A. Boyle, Starkville, MS
Joseph Brown, Starkville, MS
Charles T. Bryson, Stoneville, MS
C. Eugene Cain, Jackson, MS
Joseph A. Cameron, Jackson, MS
Gordan Cannon, Hattiesburg, MS
C. T. Carley, Starkville, MS
Steven T. Case, Jackson, MS
Alfred P. Chestnut, Jackson, MS
Prentiss S. Cox, Clinton, MS
Crayton M. Crawford, Mississippi State, MS
David Creed, Hattiesburg, MS
Roy A. Crochet, Stennis Space Center, MS
W. Lawrence Croft, Mississippi State, MS
Asok K. Dasmahapatra, University, MS
Ralph Didalake, Jackson, MS
Alice L. Douglas, Jackson, MS
Ben H. Douglas, Jackson, MS
Nell Douglas, Ridgeland, MS
B.H. Douglas, Ridgeland, MS
Roy J. Duhe, Jackson, MS
Stephen Ekunwe, Clinton, MS
Stella D. Elakovich, Purvis, MS
Mohamed Elsari, Hattiesburg, MS
Atef Elsherbeni, University, MS
Peter Fleischer, Stennis Space Center, MS
Dionne Fortenberry, Columbus, MS
D.J. Grimes, Ocean Springs, MS
Mary Lou Gutierrez-Mohamed, Jackson, MS
Gordon Gunter, Ocean Springs, MS
Portia Harris, Stennis Space Center, MS
Margot Hall, Hattiesburg, MS
Burnette Hamil, Mississippi State, MS
Robert G. Hamilton, Clinton, MS
Andrew W. Harrell, Vicksburg, MS
Thomas J. Herrin, Jackson, MS
Sabine Heinhorst, Hattiesburg, MS
Huey-Min Hwang, Jackson, MS
Rajamohan Kaluru, Jackson, MS
Wolfgang Kramer, Jackson, MS
Jerome A. Jackson, Mississippi State, MS
Phillip Kelly, Madison, MS
Paul K. Lago, University, MS
Mary C. Landin, Utica, MS
Jerzy Leszczynski, Jackson, MS
Tim Lockley, Gulfport, MS
Julia S. Lytle, Ocean Springs, MS
Thomas F. Lytle, Ocean Springs, MS
David H. Magers, Clinton, MS
Lyman Magee, University, MS
Harihara M. Mehendale, Jackson, MS
L. Hollis Melton, Ocean Springs, MS
Joan Messer, Sumrall, MS
Jean Pierre Montani, Fribourg,Switzerland
Lyle E. Nelson, Starkville, MS
Clifford Ochs, Oxford, MS
Ervin G. Otvos, Ocean Springs, MS
Robin M. Overstreet, Ocean Springs, MS
Babu Partolla, Alcorn State, MS
Dudley F. Peeler, Jackson, MS
A. Louise Perkins, Bay St. Louis, MS
John A. Pojman, Hattiesburg, MS
Aaron D. Puckett, Jackson, MS
Zahir Qureshi, Memphis, TN
Dero S. Ramsey, Starkville, MS
James Rawlins, Hattiesburg, MS
Edward Rigdin, Jackson, MS
Robin W. Rockhold, Jackson, MS
Bennie Rohr, Pascagoula, MS
James Rucker, Austin, TX
Edgar Saltsman, Santa Ana, CA
Balwant Sekhon, Richmond, VA
Muhammad I. Shafi, Holly Springs, MS
Sandra L. Sharp, Ocean Springs, MS
Troy J. Stewart, Sr., Lorman, MS
Richard Sullivan, Jackson, MS
Charles Swann, Oxford, MS
David Swanson, Riverside, CA
Mary Tan, Canton, MS
Robert D. Taylor, Houston, TX
Elizabeth Taylor, Verona, MS
Shelby F. Thames, Hattiesburg, MS
Joyce Titus, Madison, MS
Salil C. Tiwari, Fayette, MS
Suresh C. Tiwari, Fayette, MS
Cory Toyota, Jackson, MS
Warren E. Traub, Diamondhead, MS
Gregory S. Tschumper, University, MS
Suresh Tyagi, Louisville, KY
S. Kant Vajpayee, Hattiesburg, MS
Rosa Lea Walker, Jackson, MS
W. Lamar Weems, Jackson, MS
Denis A. Wiesenburg, Stennis Space Center, MS
John S. Williamson, Oxford, MS
C. A. Wilson, Mississippi State, MS
Hongtao Yu, Madison, MS

Exhibitors, 2011 Annual Meeting
Supporters of the Mississippi Academy of Sciences

DIAMOND BOOTH

1. Base Pair, UMMC
2. School of Health Related Professions, UMMC
3. USM Graduate School
4. Department of Computer Engineering, JSU
5. DR-HELP
6. Mississippi Center for Supercomputing Research
7. Pearson publishing,

GOLDEN BOOTH

1. Mississippi Functional Genomics Network ,MS INBRE, USM:
2. USM, Department of Marine Science
3. Perkin Elmer
4. Department of Chemistry, JSU
5. CISCO
6. Vashaw Scientific, Inc
7. Scientific Consultants

STANDARD BOOTH

1. College of Osteopathic Medicine, William Carry University
2. Graduate School, University of Mississippi
3. Gulf Coast Research Laboratory, Marine Education Center, USM
4. Department of Chemistry and Biochemistry, USM,
5. Forestry Suppliers, Inc.
6. School of Graduate Studies, JSU
7. Biomedical Solutions
8. College of Health, USM
9. Fisher Scientific

The Mississippi Center for Supercomputing Research (MCSR) provides free, high performance computing cycles and consulting in support of research and instruction, for all interested students, faculty, or researchers associated with any of Mississippi's eight publicly funded institutions of higher learning. The MCSR actively supports the Mississippi Academy of Sciences with regular participation in the Mathematics, Computer Science, and Statistics Division. Please visit http://www.mcsr.olemiss.edu, email assist@mcsr.olemiss.edu, or call 662-915-3922 to inquire about how we might support your HPC research or instructional computing projects at your university. Or, simply apply for an account today at http://www.mcsr.olemiss.edu/accounts.

2011 Dodgen Lecture

5:15 pm Thursday
February 17, 2011

REFLECTIONS ON THE ROLE OF SCIENCE AND SCIENTISTS IN THE ENERGY INDUSTRY

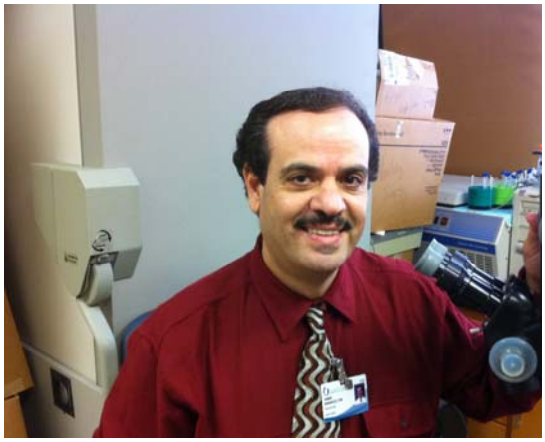
given by

Laura Folse: BP Director, Science and Technology Gulf Coast Restoration

As the Director of Science and Technology for BP's Gulf Coast Restoration Organization, Laura Folse is responsible for identifying and managing BP's scientific and technological programs initiated in response to the Deepwater Horizon oil spill.

Laura has worked in the oil and gas industry for over twenty years. Her previous role was as the Vice President of Science and Technology for the Exploration and Production Segment of BP. Her organization of over 800 scientists, engineers and technical professionals worked across BP's global enterprise to deliver research and development programs in technology, develop BP's training programs for their technical staff and offer specialized technical consultation. Laura has a BS in geology from Auburn University, a MS in geology from the University of Alabama, and an MS in management from Stanford University.

Laura's personal leadership has been profiled in M. A. Abrashoff's book *Get Your Ship Together* and featured in L Silverman's book *Wake Me Up When the Data is Over*. News journalist Auberi Edler developed a documentary of Laura's business and personal life, entitled *Something Has Really Gotta Give*, for French television.



EXECUTIVE DIRECTOR'S COLUMN

By

Dr. Ham Benghuzzi

This year marks our 75th Annual Meeting for the Academy. This past week, I was talking to a colleague about the upcoming meeting and afterwards he said, "I hope you have a successful meeting." I started to think about what constitutes a successful meeting and society. I don't think there is a right or wrong answer since one person's definition of success may be different from how someone else defines success. Some people equate success with money and others may define it by the impact you have on the lives of others. In fact, at periods of time in our lives the definition of success may change. When I step back and take a long hard look at our academy, I ask myself, is it the 75 years of annual meetings that distinguish our academy? No, it is the road that has been traveled over the years that defines us. Our organization has encountered road blocks over the years, and it has been the colleges, universities, foundations, and sponsorship of individuals that have extended a hand and helped us navigate the bumps in the road. The University of Mississippi, the University of Mississippi Medical Center, Mississippi State University, Jackson State University, and the University of Southern Mississippi over the years have been major sponsors of our organization. Dr. Ben Mitchell at the School of Health Related Professions at the University of Mississippi Medical Center stepped in when the cost to print the journal became exorbitant and worked with us to establish ways to defray the cost. Mississippi State University worked with Dr. John Boyle to host and archieve the journal for many years. The Gulf Coast Research Group provided a home for our poster boards and easles for many years before they were affected by Hurricane Katrina. This collaborative effort to pool resources is what has contributed to our longevity. **As you are attending the meeting, look around and imagine the volunteer efforts that went into the preparation of this event to make this annual meeting a success**. The planning for this meeting actually began in October of 2009. Since then, there has been a magnitude of correspondence via phone and e-mail with the Divisions Chairs, presenters, conference planners, invited speakers, etc., and intense behind the scene meetings to hold down the cost for students and attendees. The volunteers work together as a team and do so without accolades and are satisified with a mere word of thanks. A price tag can not be placed on the amount of effort and percentage of time invested by our volunteers. In our organization our volunteers measure success by the amount of inner satisifaction they receive when a student goes on to receive a diploma, secure a job, or in some cases receive a prestigious award. On behalf of the Academy, I would like to recognize the hardwork of the our President, Board of Directors, Division Chairs, Chairs of the Standing Committees, MAS Staff Volunteers (Gerri Wilson, Barbara Holmes, Lisa McCammon, Erin Wiggers, and Megan Dillon). The Academy is so indebted to the Program Team (Drs. Michelle Tucci and Ken Butler) for their work. The Academy would not be in the position it is in today without the support of the faculty and researchers in our state that contribute their scientific endeavors. For our students, I encourage you to think about the word success and what it means to you. When defining your success you will come close to a definition by asking yourself the following: what are your strengths and weaknesses? What is important to you? Remember this important thing: **success is a journey filled with accomplishments, setbacks, and mistakes all of which help to build your character**. I hope you have a successful career!

GENERAL SYMPOSIUMS
Thursday, February 17

9:00- Delivery Symposium (Health Science Division)
11:00 Water Quality Symposium (Zoology)
12:00 General Symposium TBA
1:30 Chemistry (Invited Symposium)

Thursday Evening
LOCATION: Ballroom Third Floor

5:00p THE DODGEN LECTURE

6:00p Dodgen Reception and Divisional Poster Sessions
Please set up posters as director by Dr. Jason Hale, Poster Coordinator
Hallway Third Floor

GENERAL SYMPOSIUMS
Friday, February 18

8:30 Health Fair (Health Sciences Division) Ballroom II
10:00-11:30 EXCEL FOR DATA MANAGEMENT, DATA MANIPULATION, AND STATISTICAL ANALYSIS (Mathematics, Computer Science, and Statistics Division)
1:00-4:00 INFECTIOUS DISEASE SYMPOSIUM organized by Drs. Karim and Elasri (USM) (Cellular and Molecular Division
1:00-4:00 DR.-HELP organized by Dr. Rockhold (Health Sciences Division) (Ballroom I)

OVERVIEW OF DIVISIONAL PROGRAMS

AGRICULTURE AND PLANT SCIENCE

Thursday, February 17

THURSDAY MORNING
Class room 210

8:30 Welcome

8:45 USING TRADITIONAL AND MOLECULAR TECHNIQUES TO SCREEN STRAWBERRY GERMPLASM FOR ANTHRACNOSE DISEASE RESISTANCE
9:00 OBSERVATIONS ON NATIVE MISSISSIPPI UNIOLA PANICULATA GERMINATION RATES AND GROWTH RATES
9:15 SELECTED MORPHOLOGICAL CHARACTERISTICS OF COFFEEWEED (*SESBANIA* EXALTATA RAF.) GROWN IN ELEVATED LEVELS OF LEAD CONTAMINATED SOIL
9:30 EFFECTS OF LEAD AND CADMIUM ON SEED GERMINATION AND EARLY SEEDLING GROWTH OF TALL FESCUE, WHEAT, AND MUSTARD
9:45 A POTENTIAL ALTERNATIVE INCOME FOR UNDERSERVED FARMERS: SHIITAKE MUSHROOM PRODUCTION

10:00 BREAK

10:15 EFFECTS OF LEAD ON PLANT GROWTH AND LEAD BIOACCUMULATION ON HYDROPONICALLY GROWN SESBANIA PLANTS
10:30 ANTIOXIDATIVE EFFECT OF MODIFIED EDAM WHEY USED IN EDIBLE COATING DIPS FOR PORK LOIN AND TENDERIZED BEEF STEAK

10:45 CADMIUM UPTAKE AND GROWTH OF TRITICUM AESTIVUM IN RESPONSE TO VARIOUS CONCENTRATIONS OF CADMIUM OVER TIME
11:00 THE EFFECTS OF AGRONOMIC PRACTICES ON BIOACTIVE ELEMENTS IN VERNONIA AMYGDALINA (BITTER LEAF)
11:15 THE EFFECTS OF PLANT DENSITY ON VETIVERIA ZIZANIOIDES (VETIVER GRASS) BIOMASS PRODUCTION AND CHEMICAL COMPOSITIONS

11:45 LUNCH

THURSDAY AFTERNOON
Class room 210

1:30 QUALITATIVE AND QUANTITATIVE DISTRIBUTION OF MACRO ELEMENTS FOUND IN THE LEAVES OF THE SOYBEAN PLANTS THAT WERE EXPOSED TO CHELATING AGENTS AND FERROUS ION
1:45 QUALITATIVE AND QUANTITATIVE DISTRIBUTION OF TRACE ELEMENTS FOUND IN THE LEAVES OF THE SOYBEAN PLANTS THAT WERE EXPOSED TO CHELATING AGENTS AND FERROUS ION
2:00 PHYTOTOXIC EVALUATION OF WHOLE PINE TREE SUBSTRATES
2:15 PREDICTING THE POTENTIAL DISTRIBUTION OF CHINESE PRIVET USING GEOSPATIAL MODELS IN SOUTHERN FORESTLANDS
2:30 THE EFFECTS OF PLANT DENSITY ON VETIVERIA ZIZANIOIDES (VETIVER GRASS) BIOMASS PRODUCTION AND CHEMICAL COMPOSITIONS
2:45 Divisional Business Meeting

CELLULAR, MOLECULAR AND DEVELOPMENTAL BIOLOGY

Thursday, February 17

THURSDAY MORNING
Room 216

Environmental Science, Microbiological Science and Infectious Disease

8:30 CHARACTERIZATION OF A NOVEL BACTERIAL MICROCOMPARTMENT SHELL PROTEIN IN THE CARBON-FIXING ORGANISMS PROCHLOROCOCCUS MARINUS AND HALOTHIOBACILLUS NEAPOLITANUS
8:45 THE ROLE OF THE PORES IN THE CARBOXYSOME SHELL IN METABOLITE FLUX
9:00 MICROARRY ANALYSIS OF KARENIA BREVIS GENE EXPRESSION PATTERNS IN RESPONCE TO SALINITY DIFFERENCES
9:15 ROLE OF SELENOPROTEIN M IN GULF COAST TICK (AMBLYOMMA MACULATUM)
9:30 EHRLICHIA CHAFFEENSIS AND ITS INTERACTION WITH TICK SALIVARY GLANDS
9:45 TICK INFESTATIONS AND THEIR CONSEQUENCES FOR MIGRATORY SONGBIRDS DURING SPRING STOPOVER

10:00 BREAK

Biomedical Research: Cancer, Oxidative Stress and Heart Disease

10:15 THE RESPONSE OF TAMOXIFEN-RESISTANT AND TAMOXIFEN-SENSITIVE BREAST CANCER CELL LINES TO HET0016 ALONE OR IN COMBINATION WITH OTHER CHEMOTHERAPEUTICS
10:30 EFFECTS OF miRNA REGULATION ON β-TUBULIN ISOTYPES
10:45 SYNTHESIS OF NOVEL PHOTOCLEAVABLE TRANSCRIPTION INITIATORS FOR IN VITRO SELECTION OF RIBOZYMES

11:00 REDOX REGULATION OF JAK2 IN PANCREATIC BETA ISLET CELLS
11:15 THE ROLE OF ANTI-INFLAMMATION IN PREVENTING REMODELING OF THE HEART CAUSED BY HYPERTENSION

11:30 ELECTION OF OFFICERS (Chair and Co-Chair) for serving the Cell, Molecular, and Developmental Biology Division of the MAS in 2012

NOON SEMINAR

Biomedical Research: Respiratory Disease and Antibiotic Resistant Mechanisms

1:15 ANALYZING THE FUNCTION OF THE MOLD-SPECIFIC GENE *M46,* IN THE DIMORPHIC FUNGUS *HISTOPLASMA CAPSULATUM*
1:30 OVEREXPRESSION OF GLUTATHIONE BIOSYNTHETIC GENES SUPRESS DIMORPHISM OF THE PATHOGENIC FUNGUS *HISTOPLASMA CAPSULATUM*
1:45 *MSA* PLAYS ROLE IN ANTIBIOTIC RESISTANCE AND AUTOLYSIS IN *STAPHYLOCOCCUS AUREUS*
2:00 CHARACTERIZATION OF DELETION MUTANT OF *MSA* IN *STAPHYLOCOCCUS AUREUSi*

BREAK

Biomedical Research: Neuroscience

2:30 NON-ESTERIFIED FATTY ACIDS (NEFAS) GENERATE DIFFERENT AB42 OLIGOMERS VIA TWO DISTINCT AGGREGATION PATHWAYS.
2:45 ISOLATION AND CHARACTERIZATION OF TWO DISTINCT AB OLIGOMERS GENERATED IN THE PRESENCE OF NON-ESTERIFIED FATTY ACIDS (NEFAS).
3:00 COMPETITION EXPERIMENTS SHOW THAT THE [URE3] PRION OF *SACCHAROMYCES CEREVISIAE* PUTS PRION-CONTAINING CELLS AT A GROWTH DISADVANTAGE
3:15 EFFECT OF SCOPOLAMINE AND SCHIZANDRIN ON SPATIAL LEARNING IN ZEBRA FINCH'S
3:30 A GENETIC MODIFIER SCREEN OF *MIDLINE* IDENTIFIES ENHANCER AND SUPPRESSOR GENE CANDIDATES THAT REGULATE INTEROMMATIDIAL BRISTLE FORMATION IN THE ADULT *DROSOPHILA* EYE

CONCURRENT SESSION
Room 218A
1:15 GENOMICS SYMPOSIUM (organized by Dr. Sittman, UMMC)

Friday, February 18

FRIDAY MORNING

POSTER SESSIONS
Authors should be available with their posters to answer questions from 9:00-10:30 AM

1. **MOLECULAR DETECTION OF TICK-BORNE PATHOGENS IN MIGRATORY BIRDS**
2. **DETERMINATION OF COPY NUMBER OF *HISTOPLASMA CAPSULATUM LIGD* (*LIG4* HOMOLOG)**
3. **THE ROLE OF DNA METHYLATION IN THE PATHOGENIC FUNGUS *HISTOPLASMA CAPSULATUM*.**
4. **CHARACTERIZING POPULATION OF DOUBLE-STRANDED RNA IN *KARENIA BREVIS* PRESENT AT DIFFERENT TIMES OF THE DIEL CYCLE**
5. **A GENETIC MODIFIER SCREEN IDENTIFIES *MIDLINE*-INTERACTING GENE CANDIDATES IN *DROSOPHILA***
6. **THE IDENTIFICATION OF GENES REGULATING MOTOR BEHAVIORS IN *DROSOPHILA***

MELANOGASTER

7. **THE *DROSOPHILA INOSINE TRIPHOSPHATASE* GENE REGULATES EMBRYONIC CNS DEVELOPMENT**
8. **AN UNBIASED GENETIC MODIFIER SCREEN IDENTIFYING *MIDLINE*-INTERACTING GENES IN *DROSOPHILA***
9. **MECHANICAL AND CHEMICAL STIMULATION OF THE VAGAL AFFERENT NERVES REGULATING COUGH**
10. **β-TUBULIN CLASSES II AND III ARE DIFFERENTIALLY REGULATED IN MCF7 BREAST CANCER CELLS**
11. **THE EFFECT OF MODELED MICROGRAVITY ON MACROPHAGE GENE EXPRESSION**
12. **IDENTIFICATION OF GENES DIFFERENTIALLY EXPRESSED IN ELONGATING FIBER IN A COTTON CHROMOSOME SUBSTITUTION LINE CS-B25**

11:15-11:45 Awards Ceremony for Best Oral Presentations and Best Poster Presentations

BREAK

FRIDAY AFTERNOON
Room 216

INFECTIOUS DISEASE SYMPOSIUM organized by Dr. Karim and Dr. Elasri (USM)

1.15-1.20 pm: **Opening Remarks**
1.20-1.40 pm: **Dr. Glen Shearer, USM**
Yeast/Mold Dimorphism in the Respiratory Fungal Pathogen *Histoplasma capsulatum*
1.40-1.55 pm: **Dr. Janet Donaldson, MSU**
Response of *Listeria monocytogenes* to Bile Salts
1.55-2.10 pm: **Dr. Amal Mitra, USM**
Infectious Cause of Obesity: Is It Real?
2.10-2.25 pm: **Dr. Lisa Quin, WCU**
Immune Evasion of *Streptococcus pneumonia*
2.25-2.35 pm: **Break**
2.35-2.50 pm: **Dr. Jiguo Chen, MSU**
Molecular Mechanism Governing Kaposi's sarcoma-associated Herpesvirus Latency
2.50-.3.05 pm: **Dr. Raphael Isokpehi, JSU**
Bioinformatics Analysis of Universal Stress Proteins of Infectious Disease Agents
3.05-3.20 pm: **Dr. Ross Whitman, MUW**
The [URE3] Prion of *Saccharomyces cerevisiae* as a Model for Mammalian Prions
3.20-3.35 pm: **Dr. Roark Everett, WCU**
Effects of Lysosomal Membrane Protein Depletion on the *Salmonella*-containing Vacuole
3.35-3.40 pm: **Concluding Remarks**

CHEMISTRY AND CHEMICAL ENGINEERING

Thursday, February 17

THURSDAY MORNING
Room 218 B

8:50 **INTRODUCTION AND WELCOME**
9:00 **USE OF COMBINED HPLC-MS TECHNIQUES TO OPTIMIZE PLE REACTION CONDITIONS**
9:30 **METHODOLOGY FOR SYNTHESIZING NUMEROUS UNNATURAL LYSINE ANALOGUES FROM**

A COMMON OPTICALLY PURE SYNTHON

10:00 DETECTION OF NANOPARTICLE STABILITY: FRACTINATION OF CADMIUM AND CADMIUM SELENIDE NANPARTICLES IN ANIMALS TISSUES

10:30 BREAK

10:45 NOVEL CHEMOTHERAPEUTIC AGENTS OF VANADIUM(IV) WITH THIOSEMITHIOCARBAZONES AND SCHIFF BASES AS LIGANDS: STRUCTURAL ASPECTS AND *IN VITRO* STUDIES

11:15 QUANTIFICATION OF HOMOCYSTEINE BY USING LIGAND DISPLACEMENT METHOD

11:45 LUNCH BREAK

THURSDAY AFTERNOON

INVITED SYMPOSIUM

1:30 MULTIFUNCTIONAL BRANCHED GOLD NANOSTRUCTURES FOR IMAGING AND THERAPY OF BIOLOGICAL TOXIN

2:30 PHOTOCHEMISTRY AND PHOTOTOXICITY OF POLYCYCLIC AROMATIC HYDROCARBONS

3:30 BREAK

3:45 APPLICATIONS OF PHOTOINDUCED N-O BOND CLEAVAGE IN NITROGEN ONIUM-SALTS

4:45 CLOSING REMARKS

THURSDAY EVENING
POSTER SESSION

1. **THEORETICAL CALCULATION OF THE N-H STRETCH IN AMMONIA**
2. **PREDICTING CYTOCHROME P450 SITES OF METABOLISM THROUGH 3D MOLECULAR MODELING**
3. **DISTRIBUTION OF NANOPARTICLES AND METAL IONS IN ORGANS OF RATS EXPOSED TO CADMIUM SELENIDE NANOPARTICLES**
4. **UPTAKE AND TOXICITY PATTERNS OF ZINC OXIDE NANOPARTICLES ON *ARTEMIA SALINA* LARVAE**
5. **A COMPARISON OF OPTICAL ROTATION ANGLES OF ANIMAL- AND PLANT-DERIVED BIODIESELS**
6. **DETERMINATION OF PLASTIC DENSITIES**
7. **DETERMINATION OF CALORIC VALUES OF AGRICULTURAL CROPS AND CROP WASTE BY ADIABATIC BOMB CALORIMETRY**
8. **SYNTHESIS OF ISOXAZOLINES AND ISOXAZOLES VIA 1, 3-DIPOLAR CYCLOADDITION REACTIONS IN AQUEOUS MEDIA: A GREEN APPROACH**
9. **A NEW MACROCYLE FOR ANION SENSING**
10. **MOLECUAR ENCAPSULATION AND RECOGNITION OF SULFATE ION IN AN AZAMACROCYCLE**
11. **SHORT AND LONG TERM IMPACT OF SILVER NANOPARTICLES ON *ARTEMIA SALINA* LARVAE**
12. **DEFINING THE ROLE OF OXALATE METABOLISM IN ESCHERICHIA COLI**
13. **DECARBOXYLATIVE PHOTOCYCLIZATION OF CATIONIC Ω-CARBOXYLIC ACIDS**
14. **SYNTHESIS AND PHOTOCHEMISTRY OF A LIBRARY OF BIFUNCTIONAL DNA-CLEAVING REAGENTS**
15. **BIFUNCTIONAL DNA-CLEAVING REAGENTS: DNA GROUND STATE ASSOCIATION AND CLEAVAGE**
16. **SIZE DEPENDENT LINEAR AND NON LINEAR OPTICAL PROPERTIES OF NANO MATERIAL`**
17. **SELECTIVE AMINE HOSTS FOR ANION RECOGNITION**
18. **BINDING AND SELECTIVITY ASPECTS OF AN EXPANDED AZAMACROCYCLE FOR ANIONS**
19. **EXTRACTION METHODS AND TRANSESTERIFICATION TECHNIQUES ON OIL FROM USED COFFEE GROUNDS FOR USE AS BIOFUEL FEEDSTOCK**

20. **MODIFIED CELLULOSE ESTERS**
21. **THE DEVELOPMENT OF HIGH THROUGHPUT METHODS FOR THE STUDY OF POLYMER/SURFACTANT INTERACTION; THE EFFECT OF SALT ON THE POLYQUATERNIUM-10/SLES/WATER SYSTEM**
22. **THE DEVELOPMENT OF HIGH THROUGHPUT METHODS FOR STUDY OF POLYMER/SURFACTANT INTERACTION**

Friday, February 18

FRIDAY MORNING
Room 218 B

9:00 **PROFILING UPTAKE AND TOXICITY OF TITANIUM OXIDE NANOPARTICLES ON BRINE SHRIMP**
9:20 **EXPLORATION IN OXOMETALLIC FULLERENES**
9:40 **ELECTROCHEMICAL AND SPECTROSCOPIC STUDIES OF BI- AND TETRA-NUCLEAR RUTHENIUM(II) CONTAINING COMPLEXES**
10:00 **SYNTHESIS OF SPIRO-ISOXAZOLINES VIA INTRAMOLECULAR CYCLIZATION**
10:20 **BREAK**
10:30 **REDUCTION OF SODIUM CONTENT IN MEATS BY SOAKING IN WATER**
10:50 **A NOVEL CHEMOSENSOR FOR SELECTIVE DETECTION OF PHOSPHATE IN WATER**
11:10 **A NEW TRIPODAL *TRIS*-UREA RECEPTOR FOR HALIDE BINDING**
11:30 **DECARBOXYLATIVE PHOTOCYCLIZATION OF CATIONIC PHTHALIMIDE AND QUINOLINE/ISOQUINOLINE Ω-CARBOXYLIC ACIDS**
11:50 **LIGAND IN SELECTIVE CYCLOPROPANATION REACTIONS**
12:00 **CLOSING REMARKS**
12:05 **ELECTION FOR THE NEW CHAIR AND VICE CHAIR OFFICE DIVISIONAL BUSINESS MEETING**

ECOLOGY AND EVOLUTIONARY BIOLOGY

Thursday, February 17

THURSDAY MORNING
Room 227 (Gold Leaf Room)

9:00 **INVESTIGATING MECHANISMS OF CO-OCCURRENCE BETWEEN TWO SIMILAR SPECIES OF PREDACIOUS DIVING BEETLES (*COLEOPTERA: DYTISCIDAE*)**
9:15 **A MULTIFACETED TAXONOMIC ASSESSMENT OF THE TARANTULA *APHONOPELMA ANAX* (ARANEAE: THERAPHOSIDAE) AND ITS CLOSE RELATIVES FROM SOUTH TEXAS**
9:30 **THE EFFECTS OF SALT TOLERANCE ON INTERSPECIFIC COMPETITION BETWEEN *AEDES ALBOPICTUS* AND *AEDES AEGYPTI***
9:45 **VARIATION IN STABLE ISOTOPIC RATIOS ACROSS DETRITUS TYPES FOR THREE CO-OCCURING CONTAINER MOSQUITOES**
10:00 **INFLUENCE OF DETRITUS LEVELS AND ORGANIC COMPOUNDS ON INTERSPECIFIC RESOURCE COMPETITION BETWEEN TWO TIRE-INHABITING MOSQUITO (DIPTERA: CULICIDAE) SPECIES**
10:15 **BREAK**
10:30 **PHYLOGEOGRAPHY AND DIVERSIFICATION OF THE *VAEJOVIS VORHIESI* SPECIES COMPLEX (ARACHNIDA: SCORPIONES) FROM THE "SKY ISLANDS" OF SOUTHERN ARIZONA AND NEW MEXICO**
10:45 **EXPRESSION OF THE TRANSPORTER PROTEIN, CG4991, IN THE REPRODUCTIVE TRACT OF FEMALE *DROSOPHILA MELANOGASTER***

11:00 UNDERSTANDING THE DISTRIBUTION OF *PLETHODON WEBSTERI* HIGHTON IN MISSISSIPPI
11:15 *MAGNOLIA GRANDIFLORA*: DOCUMENTING MISSISSIPPI'S BOTANICAL DIVERSITY IN THE DIGITAL AGE
11:30 LYCOPODS, HORSETAILS, AND FERNS OF MISSISSIPPI: FORTY YEARS OF PROGRESS AND CHALLENGES FOR THE FUTURE

11:45 LUNCH BREAK

THURSDAY AFTERNOON
Room 227 (Gold Leaf Room)

1:30 PHYTOPLANKTON ABUNDANCE AND PIGMENT TAXONOMY COMPOSITION IN COASTAL MISSISSIPPI WATERS
1:45 PATTERNS OF EVOLUTIONARY DIVERGENCE OF *LOTUS* (FABACEAE) ON THE CALIFORNIA CHANNEL ISLANDS BASED ON CHLOROPLAST MICROSATELLITES
2:00 PHYTOPLANKTON PRODUCTION IN THE LOWER MISSISSIPPI RIVER: TEMPORAL VARIATION AND REGULATING FACTORS
2:15 EFFECT OF UV-A IRRADIANCES ON LIPID ACCUMULATION IN *NANNOCHLOROPSIS OCULATA*
2:45 DIVISIONAL BUSINESS MEETING

GEOLOGY AND GEOGRAPHY

Thursday, February 17

THURSDAY MORNING
Room 229

9:00 ANALYSIS OF THREE-DIMENSIONALLY RECONSTRUCTED MARINE CLAY FABRIC AT THE NANOMETER SCALE
9:20 SPHAEROCYPRAEA, A "LIVING FOSSIL"
9:40 PRELIMINARY REPORT OF BED-MATERIAL ANALYSIS OF THE BOWIE RIVER ALONG THE IN-STREAM SAND AND GRAVEL MINES AT HATTIESBURG, MS
10:00 BREAK
10:20 MAASTRICHTIAN (UPPER CRETACEOUS) MARINE BRYOZOA FROM MISSISSIPPI
10:40 THE MISSISSIPPI GEOLOGICAL SURVEY 150, 100, AND 50 YEARS AGO
11:00 FLUVIAL GEOMORPHOLOGY OF TURKEY CREEK: AN ANALYSIS OF IMAGERY FROM 1940 TO PRESENT OF LAND USE CHANGES IN THE TURKEY CREEK WATERSHED IN HARRISON COUNTY, MISSISSIPPI
11:20 LUNCH

THURSDAY AFTERNOON
Room 229

1:00 GROUNDWATER FLOW IN NORTHWEST MISSISSIPPI'S ALLUVIAL AQUIFER
1:20 RARE EARTH ELEMENT (REE) PLACER DEPOSITS OF THE MISSISSIPPI EMBAYMENT
2:00 SEISMIC TOMOGRAPHY FOR INTEGRITY ASSESSMENT OF EARTHEN EMBANKMENT DAMS
2:20 BREAK
2:40 ELECTRICAL RESISTIVITY TOMOGRAPHY FOR INSPECTING EARTHEN EMBANKMENT DAMS
3:00 EXCAVATION OF AN ISOLATAED BASILOSAURID SKULL FROM THE BASAL YAZOO FORMATION OF YAZOO COUNTY, MISSISSIPPI
3:20 A COMPARATIVE ANALYSIS OF DISASTER RISK REDUCTION APPROACHES TO THE 2010 FLOODING OF SOUTH ASIA

3:40 MEASURING IN-SITU STRESS OF EARTHEN EMBANKMENTS

Friday, February 18

FRIDAY MORNING
Room 229

9:00 A DRAINAGE-BASIN ASYMMETRY INVESTIGATION OF POSSIBLE NEOTECTONIC DEFORMATION WITHIN THE BIG BLACK RIVER NEAR EDWARDS MISSISSIPPI
9:20 SEDIMENTATION AT THE WOOLSEY GAS-VENT COMPLEX IN THE NORTHERN GULF OF MEXICO
9:40 ESTIMATION OF MASS BALANCE OF GANGOTRI GLACIER USING ALOS PRISM SATELLITE IMAGE
10:00 BREAK
10:20 SURVEY OF ECONOMIC RESILIENCY OF SIX MISSISSIPPI COUNTIES AND FOUR LOUISIANA PARISHES AFFECTED BY HURRICANE KATRINA
10:40 THE MYTH OF LOCATION PRIVACY IN THE U.S.: SURVEYED ATTITUDE VS. CURRENT PRACTICES
11:00 TEXTURAL AND MINERALOGICAL ANALYSIS OF THE KONE HILL SAND, RANKIN CO., MISSISSIPPI
11:20 STORMWATER ASSESSMENT OF NUTRIENT LOADING AND E. COLI CONTAMINATION OF TOWN CREEK, JACKSON, MISSISSIPPI
11:40 DIVISION MEETING

HEALTH SCIENCES

Thursday, February 17

THURSDAY MORNING
Third Floor Ballroom I

DRUG DELIVERY SYMPOSIUM
9:00 INTRODUCTION AND OPENING COMMENTS—2011 DRUG DELIVERY SYMPOSIUM– Dr.Hamed Benghuzzi
9:15 THE MACROPHAGE RESPONSE TO AMINO ACID COATED UHMW-PE IMPLANTS IN SOFT TISSUE
9:30 A NEW MODEL FOR ACHILLES TENDON REPAIR IN THE RAT
9:45 THE EFFECT OF ANDROGEN ADMINISTRATION ON THE MACROPHAGE IN THE TISSUE IMPLANT RESPONSE
10:00 DRUG DELIVERY SYSTEMS AND APPLICATIONS—2011 UPDATE— Nanotechnology Based Drug Delivery Systems- Dr. Ateegh Al-Arabi

THURSDAY AFTERNOON
POSTER SESSION 1
Authors should be available with their posters to answer questions 1:15-4:00 PM

1. **THE EFFECT OF ORALLY ADMINISTERED MORINGA OLEIFERA ON TRYPANOSOMA INFECTED RATS**
2. **ANALYSIS OF TOBRAMYCIN RELEASE FROM BETA TRICALCIUM PHOSPHATE PASTE**
3. **THE EFFECTS OF GREEN TEA, WHITE TEA, EGCG, AND CAFFEINE ON TYPANOSOMA LEWISI INFECTED RATS**
4. **A THERMALLY RESPONSIVE S100B INHIBITORY PEPTIDE TO TREAT SCA1**

5. **THE PROGRESSION OF RENAL INJURY IN DIABETIC DAHL SALT -SENSITIVE RATS**
6. **POTENTIAL ROLE OF CYTOCHROME P450S AS BRAIN TUMOR MOLECULARTARGETS**
7. **DIFFERENTIAL EXPOSURE TO PRE- AND POST-NATAL NUTRITION PROGRAMS ALTERED GLUCOSE METABOLISM IN GROWTH RESTRICTED OFFSPRING**
8. **IN VITRO STUDY OF THE IMPACT OF TRAUMA PATIENT PLASMA ON THE GROWTH OF KIDNEY CELLS.**
9. **THE EFFECTS OF GREEN TEA, WHITE TEA, EGCG, AND CAFFEINE ON TRYPANOSOMA LEWISI INFECTED RATS**
10. **ASSESSING SCHOOL LUNCHES AS A MEDIATING FACTOR IN CHILDHOOD OBESITY**
11. **EFFECTS OF SUSTAINED DELIVERY OF EPIGALLOCATECHIN-3-GALLATE (EGCG), SELENIUM (SEL), AND THYMOQUINONE (TQ) ON ES-2 CELLS**
12. **THE EFFECTS OF THYMOQUINONE AND GREEN TEA EXTRACT ON WI-38 FIBROBLASTS EXPOSED TO LOW-DENSITY LIPOPROTEIN**
13. **EFFECTS OF CITALOPRAM ON 5-HT1A AUTORECEPTOR EXPRESSION IN NEUROBLASTOMA CELLS: CAN EPIGENETICS EXPLAIN THE CHANGES OBSERVED?**
14. **CORRELEATION OF OBESITY AND PROSTATE CANCER**
15. **THE EFFECTS OF CYCLOSPORINE A AND ESTROGEN ON GINGIVAL FIBROBLAST**
16. **THE EFFECTS OF SUSTAINED DELIVERY OF HERCEPTIN ON KIDNEY AND SALIVARY GLANDS**
17. **CORRELATING BLOOD TYPE WITH INFECTION**
18. **THE EFFECTS OF CYCLOSPORINE AND ESTROGEN ON GINGIVAL FIBROBLAST VIABILITY AND FUNCTION**
19. **THE EFFECTS OF GENISTEIN ON PROSTATE CANCER CELLS**
20. **CHEMOPREVENTIVE EFFECTS OF GREEN TEA ON ANDROGEN POSITIVE PROSTATE SPECIFIC ANTIGEN**
21. **EFFECTS OF ESTROGEN ON CLOTTING FACTORS**
22. **THE EFFECTS OF EGCG ON THROMBIN MEDIATED PLATELET ACTIVATION**
23. **THE EFFECTS OF THYMOQUINONE ON THROMBIN MEDIATED PLATELET ACTIVATION**
24. **EVALUATION OF KIDNEY FUNCTION TESTS FOLLOWING ACHILLES TENDON REPAIR**

POSTER SESSION II
6:00-7:00 PM (Following Dodgen Lecture)

25. **TRACKING FOODBORNE PATHOGENS FROM THE GROUND TO THE DINNER PLATE**
26. **PATIENT SATISFACTION**
27. **EVALUATION OF SERVICES USED COMPARING MULTIPLE FACTORS**
28. **GLUCOMETER WOES AND TRAINING CODES**
29. **CELLULAR EFFECTS OF CATABOLIC INFLAMMATORY CYTOKINES ON CHONDROCYTES**
30. **PHOSPHOLIPID PROFILE OF THE MACROPHAGE CELLULAR MEMBRANE IN RESPONSE TO CHALLENGES WITH ETHANOL AND TOXIN.**
31. **ROLE OF PLANT-DERIVED ANTIOXIDANTS ON NF-KB EXPRESSION IN LPS-STIMULATED MACROPHAGES**
32. **COMPARISON OF PH VALUES FOR EXTRACTION OF Δ-9-TETRAHYDROCANNABINOL FROM URINE**
33. **GESTATIONAL HYPERTENSIVE DISORDERS AND ADVERSE BIRTH OUTCOMES: FINDINGS FROM THE 2008 MISSISSIPPI PREGNANCY RISK ASSESSMENT MONITORING SYSTEM (PRAMS)**
34. **AUTOIMMUNE HEPATITIS: A CASE STUDY AND REVIEW**
35. **A SYSTEMATIC REVIEW OF TIME FRAMES FOR RECOVERY: AMBULATION WITH COMPRESSION VERSUS BED REST IN THE EVEN T OF A DEEP VEIN THROMBOSIS**
36. **REVIEW OF THE EFFECTS OF LOW-LEVEL INFRARED LASER THERAPY ON ACUTE ISCHEMIC STROKES**
37. **A SYSTEMATIC REVIEW OF THE EFFECTIVENESS OF LOW LEVEL LASER THERAPY IN**

REDUCING PAIN IN CHRONIC LATERAL EPICONDYLITIS

38. NOTCH ACTIVITY AND DIETARY PHYTOESTROGENS

39. **THE USE OF ^{90}YTTRIUM MICROSPHERES IN THE TREATMENT OF HEPATOCELLULAR CARCINOMA AND METASTATIC LIVER CANCER**

February 18

FRIDAY MORNING
Ballroom II
8:30 -10:30 HEALTH FAIR – BLOOD PRESSURE, GLUCOSE TESTING, BODY MASS INDEX, ETC.

Oral Presentations
Ballroom I

8:30 OPENING REMARKS AND ANNOUNCEMENTS
8:45 MATH FOR NURSES: A SURVEY OF MATHEMATICS IN THE NURSING FIELD
9:00 THE ROLE OF PHOSPHOLIPASE D PATHWAY IN MACROPHAGE RESPONSE TO ENDOTOXIN
9:15 USE OF MONOCLONAL ANTIBODIES CHEMICALLY BOUND TO A POLYSTYRENE SURFACE TO EXTRACT Δ-9-THC AND Δ-9-THCD3 FROM BIOLOGICAL SAMPLES
9:30 THE BIOCHEMICAL AND MORPHOLOGICAL CHANGES ASSOCIATED WITH MACROPHAGES AND OSTEOCLASTS WHEN CHALLENGED WITH INFECTION
9:45 BASE PAIR: EARLY BIOMEDICAL OUTREACH IMPACTS SCIENCE EDUCATION
10:00 EFFECTS OF 5% NEUTRAL NaF VARNISH ON DENTAL RESTORATIVE MATERIALS
10:15 DELTA REGION HEALTH EDUCATION LEADERSHIP PROGRAM (DR-HELP): A TRI-STATE COLLABORATION TO ACCELERATE RURAL HEALTH DELIVERY
10:30 STUDENTS COMMUNICATING THE IMPACT OF THE DEEP WATER HORIZON OIL SPILL ON THE GULF COAST

11:00-11:45 DIVISIONAL BUSINESS MEETING AND AWARDS CEREMONY FOR BEST ORAL PRESENTATIONS AND BEST POSTER PRESENTATIONS IN UNDERGRADUATE AND GRADUATE DIVISIONS

FRIDAY AFTERNOON
Ballroom I
DR-HELP Symposium

1:00 DELTA REGION HEALTH EDUCATION LEADERSHIP PROGRAM (DR-HELP): A TRI-STATE COLLABORATION TO ACCELERATE RURAL HEALTH DELIVERY

HISTORY AND PHILOSOPHY OF SCIENCE

Thursday, February 17

THURSDAY MORNING
Room 228

9:00 THE UNCERTAINTY PRINCIPLE OF SCIENCE AND THE GOD QUESTION OF PHILOSOPHY
9:30 TELEOLOGICAL EXPLANATIONS IN BIOLOGY: ANCIENT GREECE THROUGH THE ROMANTIC ERA
10:00 EVOLUTIONARY AND NATURALIZED EPISTEMOLOGICAL APPROACHES AS AN ADJUVANT TO SCIENTIFIC ENDEAVORS

10:30 BREAK
10:45 TELEOLOGICAL EXPLANATIONS IN BIOLOGY: ARISTOTLE TO KANT
11:15 BIOARCHAEOLOGICAL INVESTIGATION OF THE FORD SITE (22JA564)
11:45 LUNCH BREAK

THURSDAY AFTERNOON
Room 228

1:30 AN INQUIRY INTO THE ALLEGED DEATH OF PHILOSOPHY
2:00 Divisional Business Meeting
2:20 FREE LOGIC AND ONTOLOGICAL COMMITMENT
2:45 SUPERSTRING THEORY: AN EXERCISE IN GENERATING PROGRESS

MARINE AND ATMOSPHERIC SCIENCES

Thursday, February 17

THURSDAY MORNING
Room 231

9:00 FULL WATER COLUMN CURRENT EVENTS NEAR THE SIGSBEE ESCARPMENT AND RELATIONSHIPS TO LOOP CURRENT FRONTAL EDDIES IN THE GULF OF MEXICO
9:15 AIR-SEA CARBON DIOXIDE FLUX WITHIN THE NORTHWEST MISSISSIPPI BIGHT REGION MEASURED WITH A 3-METER DISCUS BUOY
9:30 PHYTOPLANKTON DYNAMICS ACROSS THE CONTINENTAL SHELF OF THE NORTHERN GULF OF MEXICO AS REVEALED BY HPLC-DERIVED PIGMENT SIGNATURES
9:45 TEMPORAL AND SPATIAL DISTRIBUTIONS OF PHYTOPLANKTON PRODUCTION ALONG THE SHORELINE OF THE BAY OF SAINT LOUIS, MISSISSIPPI ESTUARY
10:00 BREAK
10:15 THE USE OF LASER DIFFRACTION TO ESTIMATE THE SIZE DISTRIBUTION OF PARTICLES SUSPENDED IN THE NORTHERN GULF OF MEXICO
10:30 COMPARATIVE WIND REGIMES AT OPEN WATER AND AIRPORT SITES
10:45 SATELLITE OBSERVATION OF MESOSCALE EDDY-EDDY INTERACTIONS IN THE NORTHERN GULF OF MEXICO

11:00-11:30 Divisional Business Meeting

NOON SEMINAR

THURSDAY AFTERNOON
POSTER SESSION I
Authors should be available with their posters to answer questions 1:15-4:00 PM

1. USING ENVIRONMENTAL MODELING, TECHNOLOGY, AND COMMUNICATION FOR EARLY WARNING AND PREDICTION OF LAND FALLING TROPICAL CYCLONE/HURRICANES

2. ASSESSING GENETIC DIVERGENCE BETWEEN GULF OF MEXICO AND SOUTH ATLANTIC GRAY TRIGGERFISH POPULATIONS BY USE OF MICROSATELLITE MARKERS

3. LONG-TERM VARIATION OF POPULATION ATTRIBUTES AND PERKINSUS MARINUS INFECTION IN OYSTERS FROM MISSISSIPPI GULF COAST

MATHEMATICS, COMPUTER SCIENCE AND STATISTICS

Thursday, February 17

THURSDAY MORNING
Room 226

8:30 **A PRELIMINARY DESIGN OF A VIRTUAL SECURITY LABORATORY FOR INFORMATION SYSTEMS AND SOFTWARE ENGINEERING PROJECTS**
9:00 **CLASSIFICATION OF EEG SIGNALS BASED ON EMPIRICAL MODE DECOMPOSITION AND BAYESIAN NETWORKS APPLICATION**
9:30 **GEOGRAPHICAL STUDY OF GRADUATES FROM MVSU THROUGH GIS**

10:00 **BREAK**

10:30 **GEOGRAPHICAL STUDY OF GRADUATES FROM MVSU THROUGH GIS ODEL**
11:00 **GENERATING MATROID RESULTS FROM PROJECTIVE GEOMETRY**
11:30 **A NEW BERTRAND DUOPOLY GAME AND ITS DYNAMICAL BEHAVIORS**

12:00 **BREAK**

THURSDAY AFTERNOON
Room 226

1:30 **MOISTURE DETECTION FOR AGRICULTURAL APPLICATION**
2:00 **USE OF BINARY CODES TO DETERMINE ANCESTOR-DESCENDANT RELATIONSHIPS IN K-ARY TREES**
2:30 **CALCULUS INSTRUCTORS' ASSESSMENTS OF PRIOR KNOWLEDGE ERRORS**

Friday, February 18

FRIDAY MORNING
Ballroom III (Third Floor)

1. **ROLE OF MISUSE CASE DIAGRAMS IN ANALYZING THE SECURITY REQUIREMENTS OF A SOFTWARE ENGINEERING PROJECT**
2. **A POLYNOMIAL SOLVER IMPLEMENTATION USING WEIERSTRASS-DURAND-KERNER ALGORITHM**
3. **A POLYNOMIAL SOLVER IMPLEMENTATION USING ABERTH ALGORITHM**
4. **MICRO-CALCIFICATION DETECTION IN DIGITIZED MAMMOGRAMS USING FILTER BASED METHODS**
5. **DATA POINT VISUALIZATION AND CLUSTERING ANALYSIS**
6. **STUDENT ACHEIVEMENT IN MISSISSIPPI MIDDLE SCHOOLS AS A FUNCTION OF STUDENT EXPENDITURE AND STUDENT/TEACHER RATIO**
7. **IMPROVING MATHEMATICAL AND COMPUTER SCIENCE SKILLS THROUGH PARTICIPATORY SENSING AT CENS**
8. **COMPUTER BASED INSTRUCTION AND THE EFFECTS ON STUDENTS' ATTITUDES AND CONFIDENCE IN A COLLEGE ALGEBRA COURSE**

FRIDAY MORNING
Room 226 (Special Symposium)

10:00-11:30 **Invited Symposium**
EXCEL FOR DATA MANAGEMENT, DATA MANIPULATION, AND STATISTICAL ANALYSIS

11:30 **Divisional Business Meeting**

PHYSICS AND ENGINEERING

Thursday, February17

THURSDAY MORNING
Room 214

9:15 **THE LARGE HADRON COLIDER - A SPECTACULAR SCIENTIFIC TOY**
9:30 **THE LARGE HADRON COLLIDER MAY SOLVE MYSTERIES OF THE UNIVERSE**
9:45 **LYAPUNOV EXPONENTS AND THE INVARIANT DENSITY RECONSTRUCTION OF CHAOTICMAPS: A SWARM INTELLIGENCE APPROACH**
10:00 **CONJECTURE ON THE ANALYTICITY OF PT-SYMMERIC POTENTIALS AND THE REALITY OF THEIR SPECTRA**

10:15 **BREAK**

10:30 **RECONSTRUCTING HYDROGEN DISTRIBUTION IN AMORPHOUS SILICON: AN INVERSE APPROACH BASED ON NMR AND INFRARED DATA**
10:45 **FROM MARKOVIAN TO NON-MARKOVIAN TO MARKOVIAN**
11:00 **Invited Talk: A COMPUTATIONAL PHYSICS APPROACH TO MULTI-SCALE STRUCTURES AND DYNAMICS in BIO-FUNCTIONALIZED SOFT NANO-MATERIAL**

THURSDAY AFTERNOON
Room 214

1:00 **PROBING LIGHT PSEUDOSCALAR, AXIAL VECTOR STATES THROUGH $\eta_b \rightarrow \tau^+ \tau^-$.**
1:15 **RADIATION FROM PARTICLES WITH ARBITRARY ENERGY COLLIDING HEAD-ON WITH NONROTATING HIGHER-DIMENSIONAL BLACK HOLES**
1:30 **ATOMIC LEVEL UNDERSTANDING OF ESTROGEN RECEPTOR INTERACTIONS WITH ESTROGENIC LIGANDS AND SMALL PEPTIDES**

1:45 **INVITED TALK**
APPLICATION OF PHYSICS AND COMPUTATION IN MOLECULAR MODELING AND SIMULATIONS

2:15 **BREAK**

2:30 **OCEAN-ACOUSTIC PROPAGATION MODELING RELEVANT TO PETROLEUM EXPLORATION AND RECOVERY**
2:45 **MARINE ACOUSTIC SIGNALS AND NOISE**
3:00 **STRING THEORY AND AUM: INVESTIGATIONS INTO A TRUE THEORY OF EVERYTHING**
3:15 **ALERT SYSTEM FOR HOMELAND SECURITY APPLICATION**
3:30 **MOISTURE DETECTION FOR AGRICULTURAL APPLICATION**

3:45 **DIVISION BUSINESS MEETING**

THURSDAY EVENING
Ballroom III (Third Floor)

6:00 **Dodgen Reception and Poster Session**

1. **TWO PHOTON SPECTROSCOPY OF RUBIDIUM**

PSYCHOLOGY AND SOCIAL SCIENCES

Thursday, February 17

THURSDAY MORNING
218A
ORAL PRESENTATIONS

9:00 AGONISTIC BEHAVIOR IN MALE AND FEMALE GARNETT'S BUSHBABY (OTOLEMUR GARNETTII)
9:15 ASSESSING RELATIONSHIPS AMONG SOCIAL JUSTICE, VOLUNTEERISM, AND COMMUNALISM BELIEFS
9:30 ONLINE ROLE-PLAYING GAMES: HOW LEGITIMATE IS THE POTENTIAL FOR ADDICTION?
9:45 TEENS AT RISK: SUICIDE, DEPRESSION AND SELF ESTEEM
10:00 QUESTION AND ANSWER SESSION
10:15 BREAK
10:30 SOCIOECONOMIC FACTORS INFLUENCING DISPARITIES IN IMMUNIZATION: A META-ANALYSIS OF NIS/NHIS STUDIES
10:45 RELATIONSHIP BETWEEN ATTITUDES TOWARD INTERCULTURAL SENSITIVITY, MULTICULTURALISM AND ETHNOCENTRISM AMONG COLLEGE STUDENTS
11:00 COLLEGE STUDENTS ATTITUDES ON THE MEDIA'S COVERAGE ON TERRORISM
11:15 RISK PERCEPTION AND PREPAREDNESS FOR NATURAL DISASTERS
11:30 QUESTION AND ANSWER SESSION
11:45 LUNCH

THURSDAY AFTERNOON

1:30-3:30 DIVISION POSTER PRESENTATIONS

1. POSSIBLE INVOLVEMENT OF PRESYNAPTIC 5HT-1B AUTORECEPTOR IN THE LASTING NEUROBEHAVIORAL TERATOGENICITY OF EARLY SSRI EXPOSURE
2. INDIVIDUAL'S ROLE WITHIN A SPORT AND TEAM COHESION
3. WORKING MEMORY AND FOOD CRAVINGS FOR HEALTHY AND UNHEALTHY FOODS
4. NEO FACET SCALE CORRELATES OF THE SNAP NARCISSISTIC PERSONALITY DISORDER SCALE
5. THE EFFECTS OF TIME CONSTRAINTS ON REGRET
6. NEO FACET SCALE CORRELATES OF THE MMPI-2 WORK INTERFERENCE SCALE
7. NEO FACET SCALE CORRELATES OF THE SNAP PARANOID PERSONALITY DISORDER SCALE
8. DOES MATERNAL PSYCHOPATHOLOGY MEDIATE THE RELATION BETWEEN PARENTING EFFICACY AND CHILD DISRUPTIVE BEHAVIORS?
9. THE EXAMINATION OF CHILD NEUROPSYCHOLOGICAL FUNCTIONING AND PARENTING FACTORS AS UNIQUE PREDICTORS OF ADHD DIAGNOSIS AND SYMPTOM SEVERITY
10. FRIENDSHIP PRESENCE ON THE PLAYGROUND AND ITS ASSOCIATION TO PHYSICAL ACTIVITY LEVEL: A PRESCHOOL SAMPLE
11. BELIEFS ABOUT OBESITY
12. THE INTERACTION BETWEEN ADHD SYMPTOM SEVERITY AND EXECUTIVE DYSFUNCTION IN THE PREDICTION OF UNDERACHIEVEMENT IN READING AMONG SCHOOL-AGED CHILDREN
13. SOCIAL RELATIONSHIPS OF CHILDREN WITH DISABILITIES IN INCLUSIVE CLASSROOMS: COMPARISONS TO THEIR TYPICAL PEERS
14. ON THE EFFECTS OF NONCALORIC SWEETENERS ON THE WEIGHT OF RATS
15. ROLE OF SELF ESTEEM AND SUICIDE IDEATION AMONG AFRICAN AMERICAN COLLEGE STUDENTS
16. SCHOOL'S RACIAL COMPOSITION: STRESS,SELF-ESTEEM AND SOCIAL SUPPORT OF

AFRICAN AMERICAN STUDENTS

17. **COLOR OF IMPLICIT LEARNING**
18. **EFFECT OF CELL PHONE USAGE UPON ENVIRONMENTAL CHANGE DETECTION**
19. **CHANGING VIEWS: SPIRITUALITY AND COPING STYLES OF AFRICAN AMERICANS**
20. **THE RELATIONSHIP BETWEEN PENDING LAYOFFS AND THE PSYCHOLOGICAL WELL-BEING OF THE WORKERS**
21. **WEIGHT, BODY IMAGE, AND SELF- ESTEEM: A COMPARISON OF AFRICAN-AMERICAN AND CAUCASIAN FEMALE COLLEGE STUDENTS**
22. **PARENTAL RELATIONSHIP AND ITS EFFECT ON COLLEGE STUDENTS' ROMANTIC RELATIONSHIP**
23. **ATTITUDES TOWARD TERRORISM AMONG COLLEGE STUDENTS**
24. **THE MEDIA INFLUENCE ON AFRICAN AMERICAN WOMEN'S BODY IMAGE**
25. **ATTITUDES AND BELIEF OF OBESITY AMONG YOUNG ADULTS AND OLDER ADULTS**
26. **THE PERCEPTION OF HEALTH AMONG MALE AND FEMALE COLLEGE STUDENTS**
27. **MENTAL HEALTH, PHYSICAL HEALTH AND STRESS: A STUDY AMONG AFRICAN AMERICAN COLLEGE STUDENTS**
28. **PERCEIVED STRESS IN RELATION TO LOCUS OF CONTROL AMONG COLLEGE STUDENTS**
29. **OCCUPATIONAL AND PERCEIVED STRESS AMONG EMPLOYEEES IN AN INSTITUTION FOR MENTALLY CHALLENGED INDIVIDUALS COMPARED TO OTHER HEALTH RELATED FIELDS**
30. **ALCOHOL PROBLEMS AND AGGRESSION AMONMG AFRICAN AMERICAN MALE COLLEGE STUDENTS**
31. **THE RELATIONSHIP BETWEEN PERSONALITY TYPES AND TEXT MESSAGING**

3:30-4:30 Divisional Business Meeting

Friday, February 18

FRIDAY MORNING
Room 218A
ORAL PRESENTATIONS

9:00 THE ROLE OF THE PSYCHOLOGIST IN MILITARY INTERROGATIONS
9:15 TYMPANIC MEMBRANE TEMPERATURE INCREASES IN RESPONSE TO RESTRAINT STRESS
9:30 CHANGES IN HEALTH PATTERNS WITH EUROPEAN CONTACT: AN ANALYSIS OF ENAMEL HYPOPLASIAS OF THE COLONIAL MAYA AT TIPU
9:45 DENTAL MICROWEAR AND DIET CHANGE DURING THE GREEK BRONZE AND IORN AGE IN COASTAL EAST LOKRIS, GREECE
10:00 QUESTION AND ANSWER SESSION
10:15 BREAK
10:30 ANALYSIS OF FEMORAL ROBUSTICITY AT MORTON SHELL MOUND: A PRELIMINARY STUDY
10:45 ASSESSMENT OF MINIMUM NUMBER OF INDIVIDUALS AT THE MORTON SHELL MOUND OSSUARY
11:00 THE EFFECT OF URBAN MIGRATION ON DISEASE FREQUENCY IN RECONSTRUCTION-ERA NATCHEZ
11:15 LINEAR ENAMEL HYPOPLASIA ANAYLSIS OF SHADY GROVE MOUND SITE (22QU525)
11:30 QUESTIONS AND ANSWER SESSION
11:45 LUNCH

FRIDAY AFTERNOON
Room 218 A
ORAL PRESENTATIONS

1:30 ATTEMPTING TO BYPASS THE BIASES: AN EVALUATION OF THREE MISSISSIPPIAN PERIOD POPULATIONS
1:45 THE MEASURE OF A MAN: A COMPARISON OF STATURE FORMULAE FOR THE BIOARCHAOLOGICAL RECORD

2:00 ASSESSMENT OF HEALTH PATTERNS AT SHADY GROVE (22QU525), AN EARLY MISSISSIPPIAN SITE, USING LONG BONE DIMENSIONS
2:15 SERVICE LEARNING IN SECONDARY MATHEMATICS EDUCATION
2:30 QUESTION AND ANSWER SESSION

SCIENCE EDUCATION

Thursday, February 17

THURSDAY MORNING
RC Cook University Union Second Room B and C

8:00 INCORPORATION OF SERVICE LEARNING INTO GENERAL COLLEGE ECOLOGY
8:15 BASE PAIR: EARLY BIOMEDICAL OUTREACH IMPACTS SCIENCE EDUCATION
8:30 A LOOK AT COLLEGE STUDENTS' REMEMBERING AND UNDERSTANDING OF DNA, GENES, TRAITS, AND PROTEINS AND HOW THESE CONCEPTS RELATE TO ONE ANOTHER
8:45 ASSESSMENT COMPARISONS BETWEEN LECTURE-BASED OR INQUIRY EMPHASIZED TEACHING: WHAT IS FAIR?
9:00 PRE-SERVICE TEACHERS' PERCEPTION OF THE PARTICULATE NATURE OF MATTER.
9:15 *FLORA OF THE NATURAL HABITATS OF THE MISSISSIPPI GULF COAST COMMUNITY COLLEGE: A FIELD GUIDE*
9:30 CAN ONLINE DISCUSSION BOARDS FACILITATE STUDENTS' CLIMATE CHANGE LITERACY AND THE UNDERSTANDING OF THE NATURE OF SCIENCE?
9:45 "ENCOURAGING A CLEVER PUPIL"--HOW LINNAEUS INTEGRATED TEACHING AND RESEARCH

10:00 BREAK

10:15 CAPITALIZING ON INFORMAL SCIENCE EDUCATION OPPORTUNITIES: NATIONAL FOSSIL DAY AND THE GEOLOGY OF MISSISSIPPI
10:30 INCREASE STUDENT LITERACY SKILLS USING CASE STUDIES
10:45 USING COLLEGE READINESS STANDARDS AND PERFORMANCE LEVEL DESCRIPTORS TO ENHANCE HIGH SCHOOL SCIENCE INSTRUCTION

11:00 USING POPULAR MOVIES IN SCIENCE EDUCATION

11:30 Divisional Business Meeting

THURSDAY AFTERNOON
Theater Second Floor

1:00 THE ART MUSEUM: A PLACE OF EDUCATION THROUGH VIEWING AND DOING
1:15 IT IS NEVER TOO SOON TO LEARN ABOUT THE BODY
1:30 KEEPING YOUR HANDS CLEAN
1:45 REJECTING MYTHS AND MISCONCEPTIONS IN ASTRONOMY FOR THE MIDDLE GRADES
2:00 TEACHING FIFTH GRADERS THE LAWS OF MOTION, ENGERY, AND LIGHT
2:15 DEVELOPMENT OF ROBOTICS SKILLS IN SECOND AND THIRD GRADE STUDENTS TO IMPROVE PROFECIENCES IN SCIENCE, TECHNOLOGY, ENGINEERING, AND MATHEMATICS

2:30 BREAK

2:45 FORMAL AND INFORMAL ENVIRONMENTAL EDUCATION IN THE NORTHERN GULF OF MEXICO: AN EXPERIENTIAL LEARNING PROJECT FOR UNDERREPRESENTED AND UNDERSERVED POPULATIONS

3:00 DEVELOPING COMPLIMENTARY EDUCATIONAL BROCHURES FOR THE PUBLIC VISITING THE INSTITUTE FOR MARINE MAMMAL STUDIES
3:15 BREAKING INTO SHELLS!
3:30 RECOVERING AND RESTORING LIBRARY MATERIALS AT THE NATIONAL OCEANIC AND ATMOSPHERIC ADMINISTRATION

THURSDAY EVENING

6:00 Dodgen Reception and Poster Session

1. EXAMINING THE IMPACT OF TASK ORDER ON A TREE THINKING PRETEST
2. PRESCHOOL SCIENCE
3. DR. THOMAS F. LYTLE AND DR. JULIA S. LYLE AND A HISTORY OF RESEARCH IN MARINE CHEMISTRY AT THE GULF COAST RESEARCH LABORATORY
4. IDENTIFYING COLLEGE STUDENTS' ALTERNATIVE IDEAS ABOUT CELLULAR RESPIRATION
5. REVISION OF *CHEMISTRY LAB II MANUAL*
***6.* A QUANTITATIVE STUDY OF THE EFFECTIVENESS OF INFORMAL BIOLOGY EDUCATION**

ZOOLOGY AND ENTOMOLOGY

Thursday, February 17

THURSDAY MORNING
R. Cook University Union Room H (Second floor)

9:00 A RETROSPECTIVE STUDY ON HUMAN PARASITIC AND MYCOTIC INFECTIONS IN MISSISSIPPI
9:20 OCHOCERCIASIS AND THE SOCIOECONOMIC CHALENGE FOR THE THIRD-WORLD COUNTRIES.
9:40 THE CARRIER RATE OF NEW CASTLE DISEASE VIRUS IN DUCKS IN OWERRI AREA OF IMO STATE, NIGERIA
10:00 THE DELIMA OF LEISHMANIASIS
10:20 SCHISTOSOMIASIS AND THE SOCIOECONOMIC MALAISE OF THE THIRD-WORLD COUNTRIES

10:30 BREAK

10:40 GENDER DIFFERENCES IN FHH.1^{BN} CONGENIC RATS

Invited Symposium SYMPOSIUM ON WATER QUALITY OF THE LOWER MISSISSIPPI RIVER

11:00 WATER QUALITY STUDIES ON THE LOWER MISSISSIPPI RIVER IN THE PORT GIBSON AREA, MISSISSIPPI DURING THE WINTER OF 2009.
11:20 WATER QUALITY STUDIES ON THE LOWER MISSISSIPPI RIVER IN THE PORT GIBSON AREA, MISSISSIPPI DURING WINTER OF 2010
11:40 WATER QUALITY STUDIES ON THE LOWER MISSISSIPPI RIVERIN THE PORT GIBSON AREA, MISSISSIPPI DURING THE FALL, 2010

1:15 DIVISIONAL BUSINESS MEETING

THURSDAY AFTERNOON
Divisional Poster Session
1:45-2:25

1 A PRELIMINARY SURVEY OF THE AMPHIBIANS AND REPTILES OF LAKE THOREAU
2. WATER QUALITY STUDIES OF OKITANKWO RIVER IN IMO STATE, NIGERIA
3. ASSESSMENT OF GROUNDWATER QUALITY IN OWERRI MUNICIPALITY, NIGERIA

AGRICULTURE AND PLANT SCIENCE
Chair: Gloria Miller, Jackson State University
Vice-chair: David Peebles, Mississippi State University

THURSDAY MORNING
ROOM 210

8:30 Welcome

O1.01
8:45 USING TRADITIONAL AND MOLECULAR TECHNIQUES TO SCREEN STRAWBERRY GERMPLASM FOR ANTHRACNOSE DISEASE RESISTANCE

Melinda Miller-Butler[1], Brian Kreiser[1], Kenneth Curry[1], Barbara Smith[2]
[1]University of Southern Mississippi, Hattiesburg, MS, United States, [2]Southern Horticultural Laboratory, Small Fruit Unit, Poplarville, MS, United States

Anthracnose of commercially grown strawberry, *Fragaria* × *ananassa*, may be caused by any of three *Colletotrichum* species: *C. acutatum, C. fragariae*, or *C. gloeosporioides.* These destructive pathogens may cause fruit rot, leaf spot, petiole lesions, crown rot, wilt, and death of the plant. Traditional and molecular approaches were used to identify resistant strawberry germplasm. We employed a traditional disease screening method, i.e., inoculating whole strawberry plants of 31 cultivars and 50 selections with isolates of two *C. acutatum*, three *C. fragariae*, and one *C. gloeosporioides*. We also inoculated detached leaves from these cultivars with conidial suspensions of two *C. fragariae* isolates and one *C. gloeosporioides* isolate for disease score comparison to the whole plant inoculations. The gene-for-gene theory of plant/pathogen interactions proposes that a plant, resistant to a particular plant pathogen, carries a resistant (R) gene and the plant pathogen, unable to cause disease, possesses an avirulent (avr) gene. Researchers have identified two molecular markers linked to an R gene (Rca2) found in strawberry germplasm resistant to *C. acutatum*. We are screening the 81 strawberry clones for the presence or absence of the Rca2 gene. The presence or absence of the Rca2 gene markers correlated with the strawberry germplasms' resistance or susceptibility to anthracnose caused by any of the three *Colletotrichum* species will significantly decrease the time it takes to screen selections for anthracnose-resistant genotypes in future strawberry breeding programs.

O1.02
9:00 OBSERVATIONS ON NATIVE MISSISSIPPI UNIOLA PANICULATA GERMINATION RATES AND GROWTH RATES

Michael Simmons[1], Scott Caldwell[2], Patrick Biber[2]
[1]Cooperative Intern Program between the Mississippi Gulf Coast Community College – Jackson County Campus Honors Biology Students, Gautier, MS, United States, [2]the University of Southern Mississippi – Gulf Coast Research Laboratory, Ocean Springs, MS, United States, [3]the National Aeronautics and Space Administration, Stennis Space Center, MS, United States, [4]the Institute for Marine Mammal Studies, Gulfport, MS, United States

Approximately 50 seaoat (*Uniola paniculata*) inflorescence were collected from a beach in Biloxi. The seaoat inflorescence was then ground in #12, #14, #16, 8-inch sieves grit strainer to extract seeds. One thousand nine-hundred ninety-four (1994) total seaoat seeds were accumulated. Approximately 400 seeds were separated and half intensely scarred with sandpaper. Scarred seeds and control seed were placed in two separate dishes and filled with 50 ml of water. Germination rates of both treatments were observed. After germination, the germinated seeds were planted and growth measures recorded.

O1.03
9:15 SELECTED MORPHOLOGICAL CHARACTERISTICS OF COFFEEWEED (*SESBANIA* EXALTATA RAF.) GROWN IN ELEVATED LEVELS OF LEAD CONTAMINATED SOIL

Charnell Cain, Dorothy Ndishabandi, Jacqueline McComb, Sonya Hentz, Gloria Miller, Maria Begonia, Gregorio Begonia
Jackson State University, Jackson, MS, United States

The remediation of lead-contaminated soil is significant due to the inherent toxicity of lead (Pb), and the quantity of Pb discharged into the soil. One of the most cost-effective and environmentally sound technologies for the cleanup of metal-contaminated soils is by the use of plants. While much is known about the ecological evolution of metal tolerance in plants, the physiological, biochemical, and genetic mechanisms of tolerance are not well understood in the majority of resistant ecotypes such as *Sesbania exaltata* Raf.. This study was therefore conducted to determine the morphological and physiological

characteristics of *Sesbania* that had been grown in Pb-contaminated soil. *Sesbania* plants were grown in the greenhouse and exposed to various levels of Pb: 0, 1000, and 2000 mg Pb/kg soil. Plants were harvested after 6, 8, and 10 weeks of growth, and morphological characteristics were recorded (root and shoot biomass, root length, number of root nodules, shoot height, number of leaves, number of flowers, and the number and length of pods). Generally, there were no statistical differences in morphological characteristics among the treatments. Further, no discernible phytotoxic symptoms, such as chlorosis, wilting, or necrotic lesions, in neither roots nor shoots were observed. We concluded that while *Sesbania* did not fit the model of a hyperaccumulator, the plant was, nonetheless, tolerant to elevated Pb levels. Studies are underway in our research laboratory to evaluate some of the likely tolerance mechanisms of *Sesbania*.

O1.04
9:30 EFFECTS OF LEAD AND CADMIUM ON SEED GERMINATION AND EARLY SEEDLING GROWTH OF TALL FESCUE, WHEAT, AND MUSTARD

Clarence Donaldson, Austin Russell, Sonya Hentz, Jacqueline McComb, Gloria Miller, Maria Begonia, Gregorio Begonia
Jackson State University, Jackson, MS, United States

The effects of lead (Pb) and cadmium (Cd) on germination, seedling growth, and dry biomass of three plant species: tall fescue (*Festuca arundinacea cvs. Titan and Spirit),* wheat (*Triticum aestivum* L.*),* and mustard (*Brassica juncea*) were studied. Seeds were germinated in concentrations of 0, 250, 500, and 1000 ppm of each metal; lead nitrate and cadmium nitrate. Germination was significantly higher in wheat and mustard grown in Pb as compared to the two cultivars of fescue. Cadmium nitrate inhibited germination and shoot growth more severely than did Pb nitrate. Mustard, overall, was less affected in terms of germination and shoot growth for both Pb and Cd. Our results indicated that wheat and mustard exhibited some degree of tolerance to Pb and Cd which warrants further investigations.

O1.05
9:45 A POTENTIAL ALTERNATIVE INCOME FOR UNDERSERVED FARMERS: SHIITAKE MUSHROOM PRODUCTION

Lashunda Anderson[1], Patrick Igbokwe[1], Joseph Jackson[1], Wanda Millis[2]
[1]Alcorn State University, Alcorn State,MS, United States,[2]Mississippi Natural Products Association, New Hebron , MS, United States

Shiitake mushrooms, nicknamed "the elixir of life", have many benefits to human health. They can boost the human immune system, lower cholesterol levels, and inhibit tumor growth. Shiitake also contain more protein than corn, turnips, potatoes and carrots(Przybylowicz and Donoghue, 1990). The market for fresh shiitake is expanding in the United States. The United States is the largest consumer of mushrooms in the world (Sistani, Ball, Sabota, 2007). Therefore, this consumption presents an open market opportunity for small farmers to increase their on-farm income. Shiitake is an "environmentally friendly" option for recycling low-value forest by-products (Bruhn and Mihail, 2009), such as logs and sawdust. Shiitake are grown on logs or sawdust blocks. Growing shiitake on sawdust blocks is a relatively new production method (Przybylowicz and Donoghue, 1990). However, log production is compatible with landowner objectives, such as timber cutting (Bruhn and Mihail, 2009). The objectives of this project are to (1) increase underserved farmers awareness about the potential of increasing on farm income with shiitake mushroom production, (2) evaluate growth room temperature differences by shelf and grow room position, and (3) evaluate the potential of sycamore, oak, hickory, sweetgum, and popular tree species for their potential in shiitake log production.

10:00 BREAK

O1.06
10:15 EFFECTS OF LEAD ON PLANT GROWTH AND LEAD BIOACCUMULATION ON HYDROPONICALLY GROWN SESBANIA PLANTS

Jacqueline McComb, Sonya Hentz, Austin Russell, Gloria Miller, Maria Begonia, Gregorio Begonia
Jackson State University, Jackson, MS, United States

Lead (Pb) is one of the best known heavy metals with a long history of toxicity. Exposure to Pb is a great concern because of its toxic nature, widespread occurrence in the environment and long life in biological systems. One way of remediating Pb-contaminated soil or water is by the use of living plants, a process known as phytoremediation. This study was carried out to assess the effects of Pb on the growth, and Pb uptake and translocation on hydroponically grown Sesbania plants exposed to lead nitrate $Pb(NO_3)_2$. Sesbania plants were grown in

the greenhouse in 15 mL styrofoam cups containing different concentrations of Pb (0, 0.1, 1.0, 5.0, 10.0, 20 μM) in the form of $Pb(NO_3)$. Plants were harvested at 0, 2, 5, 8, 12, 15 days after exposure. The shoots and roots were separated, dried in an oven at 75° C for at least 24 hours and then weighed for dry tissue biomass. Plant tissues were then acid digested and Pb accumulation was quantified by ICP-OES. Our results indicated that Pb-tissue uptake increased with increasing concentration of lead (i.e. 20 μM. versus 1.0 μM) However, plant roots and shoots displayed symptoms of toxicity (at 15 μM and 20 μM) and root and shoot biomass decreased with increasing Pb concentration. Furthermore, plants exposed to higher Pb concentrations exhibited leaf chlorosis. Overall, Sesbania was tolerant to Pb which may aid in their colonization in Pb-contaminated environments.

O1.07
10:30 ANTIOXIDATIVE EFFECT OF MODIFIED EDAM WHEY USED IN EDIBLE COATING DIPS FOR PORK LOIN AND TENDERIZED BEEF STEAK

Sashie Weerasinghe, Joshua Randle, Byron Williams, Zee Haque
Mississippi State University, Miss. State, MS, United States

The objective of this study was to investigate the efficacy of heat modified (thermized) Edam whey in protecting tenderized beef steak (semimembranosus) and pork loin against lipid oxidation. Fresh Edam whey was thermized by batch heating (70^{o}C) for various time periods, concentrated and spray dried to produce whey protein concentrate (WPC) according to common manufacturing practices in the U.S. Coating dips containing; 5% (w/v) WPC, 2.5% (w/v) sorbitol (plasticizer), 0.125% (w/v) CaCl2, with and without an additional 0.25% (w/v) enzymatic hydrolyzate of whey (WH), were dispersed in distilled water, degassed, heated at 90^{o}C for 30 min, homogenized, filtered, and the pH adjusted to 6.5 (22^{o}C). Uniformly sized cubes of meat samples (2cm^{3}) with or without coating were stored (4^{o}C) and analyzed at 24 h intervals for four days for oxidative degradation. The thiobarbituric acid reactive species (TBARS) values and peroxide values (PV) of beef steak samples were significantly impacted by the treatments; 10 min and 15 min treatment had lower ($P<0.05$) TBARS values compared to control. All treatments except 10 min (without WH) had lower ($P<0.05$) PV after 24 hours of storage. For pork loin, 10 min and 15 min treatments had lower ($P<0.05$) TBARS values throughout the storage period as compared to control. PV for pork loin were significantly lower in all treatments after 24 hours of storage. Data show a clear antioxidative action of the Edam whey based edible coatings on pork loin and tenderized beef steak.

O1.08
10:45 CADMIUM UPTAKE AND GROWTH OF TRITICUM AESTIVUM IN RESPONSE TO VARIOUS CONCENTRATIONS OF CADMIUM OVER TIME

Sonya Hentz, Jacqueline McComb, Clarence Donaldson, Gloria Miller, Maria Begonia, Gregorio Begonia
Jackson State University, Jackson, MS, United States

Cadmium (Cd) contamination of the environment is a cause of serious concern and is correlated indirectly to human health, and the food supply chain. The objective of this study was to evaluate the growth and uptake of Cd in wheat (*Triticum aestivum* L.) plants exposed to cadmium nitrate [$Cd(NO_3)_2$] over time. Wheat seeds were sown and grown in a sand medium in the greenhouse. The wheat plants were then exposed to different concentrations of Cd (0, 0.1, 1.0, 5.0, 10.0, 15.0, and 20.0μM) in the form of $Cd(NO_3)_2$ in a hydroponic solution. Plants were harvested at 0, 2, 5, 8, 12, and 15 days after Cd exposure, separated into roots and shoots, dried in an oven at 75° C, and then weighed for tissue dry biomass. The tissues were then acid-digested and Cd-tissue uptake was quantified by ICP-OES. Our results indicated that generally, Cd exposed plants displayed a decrease in root and shoot biomass compared to the control. Shoot biomass followed a dose response trend with day 15 showing the greatest level of toxicity at 20μM. Root biomass withstood Cd lethality starting at concentrations > 5μM. The highest Cd shoot concentrations were seen at day 12 in plants that had been exposed to 15μM of $Cd(NO_3)_2$. While root uptake was highest at day 12 in plants that had been exposed to 20μM $Cd(NO_3)_2$. Although wheat plant growth and uptake were affected, the plants demonstrated tolerance to cadmium contamination, which warrants further investigation.

O1.09
11:00 THE EFFECTS OF AGRONOMIC PRACTICES ON BIOACTIVE ELEMENTS IN VERNONIA AMYGDALINA (BITTER LEAF)

Andre' Payne, Patrick Igbokwe, Joseph Jackson
Alcorn State University, Alcorn State, MS, United States

Vernonia Amygdalina (bitter leaf) is a small rainforest shrub belonging to the compositae (Asteraceae) family (Adedeji, and Jewoola, 2008). It is native to West and Central Africa (Nwanjo, 2005). *Vernonia amgydalina* is an important vegetable species (Adedeji and Jewoola, 2008). It is commonly called bitter leaf because of its bitter taste (Atangwho, Ebong, Eyong, Williams, Eteng, and Egbung, 2009). Bitter leaf is a plant with diverse medical uses (Challand et al, 2009). It can be used for treatment of cough, fever and digestive illnesses (Obute and Adubor (2007). Additionally, juices from the leaves of the bitter leaf can treat ring worm and other skin irritations (Obute et al, 2007). Leaf infusions can decrease loss of appetite and encourage the management of diabetes, malaria and intestinal complaints (Obute et al, 2007).There has been extensive research on the nutritional status of the bitter leaf plant, yet little work has been conducted on the agronomic practices (Opabode and Adebooye, 2005).

A study was conducted at Alcorn State University Experiment Station to determine the effects of plant spacing and leaf harvestation (stripping and clipping) on the bioactive elements of bitterleaf. A randomized complete block design was used containing two plant spacings (3 feet and 4 feet) and two leaf harvestation methods (clipping and stripping). The objectives of this study were (1) to evaluate the effects of leaf harvestation on bioactive elements and (2) to determine the effects of plant spacing on the bioactive elements in the bitterleaf plant.

O1.11
11:15 THE EFFECTS OF PLANT DENSITY ON VETIVERIA ZIZANIOIDES (VETIVER GRASS) BIOMASS PRODUCTION AND CHEMICAL COMPOSITIONS

THURSDAY AFTERNOON
ROOM 210

O1.12
1:30 QUALITATIVE AND QUANTITATIVE DISTRIBUTION OF MACRO ELEMENTS FOUND IN THE LEAVES OF THE SOYBEAN PLANTS THAT WERE EXPOSED TO CHELATING AGENTS AND FERROUS ION

Marisa Stanton, Tiffany Spann, Manju Pande, Mudlagiri Goli
MVSU, Itta Bena, United States

Although J. C. Brown's paper on iron uptake by kidney bean attempts to capture beans intake of macro elements, there are no reports that have looked into the systematic qualitative and quantitative distribution of macro elements present in soybean leaves during the flowering stage of the plant subjected to chemical chelating agents and ferrous ion. In this initial report,the attempt is made to apply the chelating agents citric acid, disodium EDTA (DSEDTA), Salicylic acid and trace metal ferrous ion ($FeCl_2$),and also the combination of those chelating agents with $FeCl_2$. This study was carried out the summer of 2010, in the greenhouse with pots containing potting soil with each pot carrying four soybean seeds of round up resistant Pioneer 95Y70 cultivar. There were four pots for each kind of experiment: Control, $FeCl_2$, citric acid, DSEDTA, Salicylic acid, Citric + $FeCl_2$,EDTA+ $FeCl_2$, Salicylic +$FeCl_2$. Of the six macro elements analyzed the trend remains: N>K>Ca>Mg>S>P.

With plain chelating or chelating agent with Fe^{+2} with it, as expected DSEDTA turned out to be a best carrier for K, Ca and Mg in to the plants. Salicylic and citric acid have almost similar uptake behavior coming close to second and third after DSEDTA. Adding the chelating agents did definitely increase the uptake of K, Ca and Mg. As explained in another abstract, the effect of these chelating agent treatments had always following absorption trend of trace metals Mn>Fe>B>Zn>Al>Na>Cu irrespective of the treatments.

O1.13
1:45 QUALITATIVE AND QUANTITATIVE DISTRIBUTION OF TRACE ELEMENTS FOUND IN THE LEAVES OF THE SOYBEAN PLANTS THAT WERE EXPOSED TO CHELATING AGENTS AND FERROUS ION

Marisa Stanton, Tiffany Spann, Manju Pande, Mudlagiri Goli
MVSU, Itta Bena, United States

There have yet to be any reports on the systematic study of the distribution of trace elements in the leaves of soy plants during their flowering (vegetative) stage that have been treated with various organic chelating agents. The chelating agents that were applied include Citric acid, Disodium EDTA (DSEDTA), Salicylic acid, and also the combination of those chelating agents with $FeCl_2$ which were tested on eight groups of soybean plants. We had a total of 32 pots divided into eight groups of 4, each pot containing 4 seeds. The results concluded that regardless of the type of chemical treatments, the qualitative content of the trace minerals in the leaves remains in the same order. Of the major trace elements analyzed, the trend remains Mn>Fe>B>Zn>Al>Na>Cu. The quantitative distribution of these trace elements when the plants were exposed to just the chelating agents, the general trend was DSEDTA followed by Salicylic acid and Citric acid. Similar was the case when the plants were exposed to chelating agents along with the metal $FeCl_2$, the order became: DSEDTA+Fe^{+2}>Salicylic acid + Fe^{+2} >Citric acid+Fe^{+2}>Control. **DSEDTA** turned out to be a good chelating agent and great for trace metal uptake by the plants compared to other chelating agents.

O1.14
2:00 PHYTOTOXIC EVALUATION OF WHOLE PINE TREE SUBSTRATES

Anthony L. Witcher[1], Kenneth J. Curry[2], Eugene K. Blythe[3], Glenn B. Fain[4], James M. Spiers[1]
[1]USDA-ARS Southern Horticultural Lab, Poplarville, MS, United States, [2]University of Southern Mississippi, Hattiesburg, MS, United States, [3]Coastal Research and Extension Center, Mississippi State University, Poplarville, MS, United States, [4]Auburn University, Auburn, AL, United States

Decreased availability and increased cost of quality substrates are issues facing many horticulture crop producers. Peat moss and pine bark are the most widely used substrate components, yet producers have become more aware of acceptable alternative components. Processed whole pine trees have been identified as an effective substrate component for horticulture crop production, while plant propagation evaluations in such substrates have yielded less desirable results. A simple, direct method for evaluating potential phytotoxicity would be a useful tool for developing alternative substrates, including whole pine tree (WPT) substrates. A PhytotoxKit was used to evaluate root length and calculate percent inhibition of seed germination and root growth for three plant species exposed to a reference soil compared with those in saline pine bark, aged WPT, fresh WPT, aged pine needles, and fresh pine needles. The PhytotoxKit allowed for direct contact of seed and substrate, along with subsequent observation and root measurement of germinated seeds. Saline pine bark produced the greatest inhibition of seed germination and root growth in *Sinapis alb*a, while fresh pine needles resulted in the greatest inhibition of *Lepidium sativum and Sorghum saccharatum*. *Lepidium sativum* and *Sorghum saccharatum* mean root length was greatest in aged WPT, while *S. alba* mean root length was greatest in the fresh WPT. We discovered fresh pine needles can be phytotoxic to some plant species, yet further research is required to determine whether the presence of pine needles has led to reduced plant growth in WPT substrates.

O1.15
2:15 PREDICTING THE POTENTIAL DISTRIBUTION OF CHINESE PRIVET USING GEOSPATIAL MODELS IN SOUTHERN FORESTLANDS

Yuan Tan, Zhaofei Fan
Mississippi Sstate University, Starkville, MS

Chinese privet is one of the most prevalent invasive species in southern forestlands and has severely threatened to the integrity and healthy of forest ecosystems. Through USDA Forest Service's Forest Inventory and Analysis (FIA), 6,408 plots out of 36,729 FIA plots were infested by Chinese privet in southern forestlands between 2001 and 2008. Autologistic regression model and simultaneous autoregressive model were employed to analyze the relationship between the presence and abundance of Chinese privet and related driving variables including geographic conditions, stand and site conditions, as well as natural and anthropogenic disturbances in southern forestlands at the plot level and county level

respectively. Geospatial models at both levels show that human-related disturbances are the major driving factors of the invasion in southern forest lands and they interact with forest types and stand conditions to stimulate or weaken the spread of Chinese privet. Distances to formerly infested plots/highway/cities are negatively associated with the presence probability of Chinese privet. The closer to highways, cities or formerly infested plots, the more chances to obtain seeds. Additionally, Chinese privet is more likely to be detected in forest edge or private forests where human damage the original balance. Forest type and stand conditions are significantly related to the existence and abundance of Chinese privet. The positive relationship exists between the abundance of Chinese privet and the proportion of oak forest. Furthermore, the perfect habits for the growth of Chinese privet are the areas with high resource availability, moisture and more growing space availability.

2:30 DIVISION BUSINESS MEETING

CELLULAR, MOLECULAR AND DEVELOPMENTAL BIOLOGY
Chair: Sandra Leal,
University of Southern Mississippi
Vice-chair: Vijay Rangachari
University of Southern Mississippi

THURSDAY MORNING
Room 216

Environmental Science, Microbiological Science, and Infectious Disease

O2.01
8:30 CHARACTERIZATION OF A NOVEL BACTERIAL MICROCOMPARTMENT SHELL PROTEIN IN THE CARBON-FIXING ORGANISMS *PROCHLOROCOCCUS MARINUS* AND *HALOTHIOBACILLUS NEAPOLITANUS*

Evan Roberts[1], William Hirst[2], Sabine Heinhorst[1], Gordon Cannon[1]
[1]University of Southern Mississippi, [2]Vassar College

Specialized organelles, known as bacterial microcompartments (BMCs), are being discovered in an increasing number of bacterial species, where they participate in various metabolic processes. Cyanobacteria and certain chemoautotrophs contain BMCs known as carboxysomes, which sequester carbon dioxide inside a polyhedral shell that is comprised entirely of protein. Enclosed within the carboxysome interior is the enzyme ribulose-1,5-bisphosphate carboxylase/oxygenase (RubisCO). RubisCO catalyzes the first step in the Calvin-Benson-Bassham Cycle, which converts inorganic carbon dioxide into organic cellular precursors. To understand how the structure of the carboxysome relates to its function, it is necessary to characterize the full complement of carboxysome shell proteins. In this study, the double domain BMC protein CsoS1D from the chemoautotrophic sulfur bacterium *Halothiobacillus neapolitanus* was expressed recombinantly and used to generate a polyclonal antibody. A carboxysome purification procedure was developed for the marine cyanobacterium *Prochlorococcus marinus* MED4, and the carboxysome protein composition was characterized by one- and two-dimensional gel electrophoresis. The CsoS1D protein co-purified with purified carboxysomes of both bacteria during centrifugation on a sucrose gradient and was found to be associated with the shell, as shown by immunoblotting with species-specific anti-CsoS1D antibodies. Our finding suggests that the carboxysome composition is likely more complex than was previously assumed based on the gene complement of the classical carboxysome operon.

O2.02
8:45 THE ROLE OF THE PORES IN THE CARBOXYSOME SHELL IN METABOLITE FLUX

Jenifer Milam[1], Balaraj Menon[1], Fei Cai[2], Seth Axen[2], Cheryl Kerfeld[2], Gordon Cannon[1], Sabine Heinhorst[1]
[1]University of Southen Mississippi, [2]Department of Energy Joint Genome Institute

The carboxysome, a polyhedral protein microcompartment found in all cyanobacteria and in many chemoautotrophs, is filled with ribulose-1,5-bisphosphate carboxylase/oxygenase (RubisCO), the enzyme that catalyzes the fixation of CO_2 onto ribulose-1,5-bisphosphate and produces two molecules of 3-phosphoglycerate. Although it is well established that RubisCO derives a catalytic advantage from compartmentalization, the molecular mechanism by which its substrates and products traverse the carboxysome shell is not well understood. The central pores formed by the hexameric assemblies of the major shell proteins, multiple CsoS1 paralogs, have been implicated in

facilitating the flux of metabolites into and out of the carboxysome interior. To assess the role of the pores in metabolite transfer, we have made use of structural models to target key residues in the conserved pore motif of CsoS1A for mutagenesis. The hexamers of the resulting CsoS1A mutants are predicted to form pores of different shape, charge or diameter. Mutant constructs have been generated and have been used to replace the wild type allele in *H. neapolitanus*. Genotypic and phenotypic characterizations of the *H. neapolitanus csoS1A* pore mutants are underway in preparation for an assessment of structure and function of their carboxysomes.

O2.03
9:00 MICROARRY ANALYSIS OF *KARENIA BREVIS* GENE EXPRESSION PATTERNS IN RESPONCE TO SALINITY DIFFERENCES

David Jayroe, Timothy McLean
University of Southern Mississippi

Karenia brevis is a toxic marine dinoflagellate that causes harmful algal blooms (HABs), also known as red tides, in the Gulf of Mexico. Red tides occur nearly annually off the coast of Florida and Texas. These red tides almost never occur along the Alabama, Mississippi, and Louisiana coastlines in the northern Gulf--only a single red tide event has been documented in these waters and was believed to be a result of a tropical storm transporting an existing bloom northward. One hypothesis states that the absence of blooms in the northern Gulf is due to lower ambient salinity, primarily from Mississippi River discharge, which limits *K. brevis* growth. We investigated this hypothesis by culturing *K. brevis* in the laboratory under a variety of salinity regimes. Some cultures were kept growing in high salinity (open ocean) media, and others were diluted and allowed to acclimate to lower salinities. These salinities spanned a range of 32 parts per thousand (ppt) to 19 ppt. After a 7-day incubation, cells were harvested, and total RNA was extracted for analysis on a *K. brevis*-specific microarray. Once the microarrays have been scanned, we will be able to identify which genes are being differentially expressed due to the changing salinity, that, in turn, will allow for a better understanding of growth potential and regulation under those specific environmental circumstances. Additionally, the data will enhance our emerging efforts to increase transcriptomic annotations, create gene clusters, and build gene regulatory network models for this environmentally and economically important organism.

O2.04
9:15 ROLE OF SELENOPROTEIN M IN GULF COAST TICK*(AMBLYOMMA MACULATUM*)

Parul Singh, Rachel Truhett, Shahid Karim
University of Southern Mississippi

The Gulf-coast ticks transmit disease-causing pathogens to humans and animals. *Rickettsia parkeri* is notable among the pathogens transmitted by *A. maculatum* to humans. Heavy infestations of *A. maculatum* on animal ears cause it to become thickened and curled, a condition commonly called "gotch ear". The tick's multifunctional salivary glands are vital to their biological success and likely also play a critical role in transmission of disease; tick saliva contains a broad array of secretory products that facilitate prolonged tick attachment and feeding, disrupting tick blood feeding or inactivating key tick salivary proteins presents a novel strategy for tick-borne disease prevention. Sequencing of *A. maculatum* salivary gland normalized cDNA library revealed a gene sequence homologous to Selenoprotein M. Trace element Selenium exhibits a variety of functions in the form of Selenoproteins, most importantly, as an antioxidant enzyme. Selenoprotein M is expressed in *A. maculatum* salivary glands in almost all the feeding phases. RNA interference (RNAi) was used to assess the role of this molecule for tick feeding success. Silencing of was demonstrated by reduced transcript in salivary glands removed from partially fed ticks. Disrupting expression of Selenoprotein M by RNAi induced rapid weight gain in engorging female ticks in early phase of feeding.Since many Selenoproteins are involved in anti-oxidant activities, we further evaluated the anti-oxidant capacity of tick tissues treated with SelM-dsRNA. There was a significant reduction in the antioxidant capacity in Selenoprotein M silenced tick tissues.

O2.05
9:30 *EHRLICHIA CHAFFEENSIS* AND ITS INTERACTION WITH TICK SALIVARY GLANDS

Rachel Truhett, Shahid Karim, Laila Ali, Parul Singh
University of Southern Mississippi

Ticks are an example of ecto-parasites that steal blood, a source of nutrients, from their vertebrate hosts for prolonged periods of time. Our experiment is an attempt to develop a weight-based sex differentiation tool for RNAi and *in vitro* pathogen infections among the adult females. The relationship between weights of engorged nymphs and their adult sexes in A*mblyomma americanum* was addressed in this study. Flat nymphs were fed to complete repletion on New Zealand white rabbits, weighed individually and divided into groups based on their weight, and kept until they molted. This suggests that nymphs of this species that become female presumably imbibe more blood than those that became male. To further confirm, we inoculated an obligate intracellular bacterium, *Ehrlichia chaffeensis* Arkansas strain infected DH82 cells in the heavier engorged nymphs and kept them for molting at 34°C and 90% relative humidity. Freshly molted adults were used to test the *E. chaffeensis* infection rate. *E. chaffeensis* genomic DNA was extracted from individual unfed and partially fed midguts and salivary glands. The tissue samples were tested for the presence of *E. chaffeensis* using nested Polymerase Chain Reaction (PCR). PCR amplified fragments were detected in unfed and partially fed tissues. Our experiment demonstrated successful *E. chaffeensis* infection of female adult salivary glands for our proposed RNAi studies. Using various gene specific primers, we tested transcriptional expression of selected salivary genes in the clean and *E. chaffeensis* infected tick's salivary glands. Our results demonstrated the differential expression of selected gene transcripts in infected glands.

O2.06
9:45 TICK INFESTATIONS AND THEIR CONSEQUENCES FOR MIGRATORY SONGBIRDS DURING SPRING STOPOVER

Michael Sellers, William D'Angelo, Shahid Karim, Frank Moore
The University of Southern Mississippi

Migratory birds encounter a host of challenges when making their yearly journey from tropical wintering grounds to temperate breeding grounds. One is exposure to parasites and pathogens. During the spring of 2009 and 2010, landbird migrants were visually surveyed for tick infestation when they stopped over at our Johnson's Bayou, LA, study site following migration across the Gulf of Mexico. In that time, 2,012 birds were sampled. In 2009, eight individuals among six species were infested out of the 312 captured birds (2.3% of the captured birds were infested with one or more ticks). In 2010, 42 individuals among 19 species were infested out of the 1,713 that were sampled (2.5% of the captured birds). The collected ticks and blood samples of infested and "focal" species had genomic DNA extracted and analyzed via PCR to determine if pathogens are present, if transmission is occurring, and which bird species are more likely to acquire and transmit ticks and tick-borne diseases. Currently, we have determined that *Ehrlichia chaffeensis* is present in some of the infesting ticks. We are also identifying ticks in relation to their origin. Weekly ground surveys using a drag cloth produced no ticks; therefore, the birds are likely to have arrived with them after crossing the Gulf of Mexico. Preliminary results show that some of the collected ticks are not native to North America. The energetic condition, including body mass and fat, are being analyzed in relation to tick infestations to assess impact on the stopover biology of the migratory birds.

10:00 BREAK

Biomedical Research: Cancer, Oxidative Stress, and Heart Disease

O2.07
10:15 THE RESPONSE OF TAMOXIFEN-RESISTANT AND TAMOXIFEN-SENSITIVE BREAST CANCER CELL LINES TO HET0016 ALONE OR IN COMBINATION WITH OTHER CHEMOTHERAPEUTICS

Barak Gunter[1], Tiffani Slaughter[1], Fan Fan[1], Chenghui Huang[1], Antonio Pannuti[1], Rodney Baker[1], John Falck[2], Lucio Miele[1], Richard Roman[1], Roy Duhe[1]

[1]University of Mississippi Medical Center, [2]The University of Texas Southwestern Medical Center

One of the vexing problems in controlling breast cancer is the emergence of acquired endocrine-resistance in estrogen receptor positive breast cancers that initially respond to endocrine therapy. Published reports suggest there is a close overlap between the signal transduction pathways affected by 20-hydroxyeicosatetraenoic acid (20-HETE) and those which may confer endocrine-resistance. Preliminary data indicate that 20-HETE-targeted drugs have direct cytotoxic and indirect anti-angiogenic effects on multiple carcinomas, and they therefore might be extended to unsolved problems in breast cancer control. Yet almost nothing is known about the

specific role(s) of 20-HETE in either healthy breast tissue or in breast cancer. We observed that treatment of certain tamoxifen-resistant human breast cancer cell lines with HET0016, a compound which inhibits the biosynthesis of 20-HETE, restores sensitivity to tamoxifen in cell culture. We are elucidating the signal transduction pathways involved in this phenomenon. We also observed that certain human breast cancer cell lines with intrinsic tamoxifen resistance (such as the "triple-negative" MDA-MB-468 cell line) express cytochrome P450 isoforms essential for the synthesis of 20-HETE, and we are evaluating whether we can exploit a synergistic effect of HET0016 with anti-cancer drugs currently used to treat aggressive "triple-negative" breast cancers which have an intrinsic resistance to endocrine therapy. We hypothesize that a 20-HETE-targeted agent such as HET0016 will provide an additional anti-cancer benefit due to its anti-angiogenic activities, and we are further exploring the characteristics of breast cancers that may be susceptible to combination therapy involving HET0016 and related compounds.

O2.08
10:45 EFFECTS OF miRNA REGULATION ON β-TUBULIN ISOTYPES

Kevin Morris, Sharon Lobert
University of Mississippi Medical Center

A common active ingredient in chemotherapy drugs, taxane has been shown to have limited effectiveness in treating tumors that are resistant to taxanes after repeated cycles of chemotherapy. Taxanes function by interacting with the β-subunit of the αβ-tubulin heterodimer of mircotubules. Using B-tubulin isotypes as tumor biomarkers can create better prognosis for cancer treatments and counteract drug resistance. The Biomarker study done by S. Lobert found that when given a 24-hour 400nM paclitaxel treatment, mRNA of βIIA increases relative to the mRNA of the other β-tubulin isotypes in MCF-7 cells. mRNA of βIIA also remains relatively stable when given a 16-hour actinomycin-D treatment. Due to this, it was hypothesized that there is a down-regulated miRNA that is causing β-tubulin isotypes, ideally BIIA, to remain stable after a 400 nM Taxol treatment. To test this, a series of paclitaxel drugged (experimental and non-drugged control) MCF-7 cells were used to make cDNA after a 24-hour incubation period. MicroArrays of the cDNA samples were then used to compare the regulation levels of the miRNA within the cell, and miRNA assays were performed to validate results obtained from the MicroArrays. As a result, miRNA 100 was found to be down-regulated in the Microarrays and validation assays. The down regulation of this miRNA could be the cause of the stability in the message of BIIA after a 400nM Taxol/actinomycin-D treatment of MCF-7 cells.

O2.09
10:45 SYNTHESIS OF NOVEL PHOTOCLEAVABLE TRANSCRIPTION INITIATORS FOR IN VITRO SELECTION OF RIBOZYMES

Faqing Huang, Yongliang Shi
University of Southern Mississippi

Covalent attachment of chemical functionalities to biomacromolecules (DNA/RNA/protein) through photocleavable linkers (PC) has broad applications in chemistry and biomedical research. Here we report the synthesis of two novel photocleavable transcription initiators that can be used for the preparation of functionalized RNA for in vitro selection of RNA catalysts. A photocleavable bifunctional O-nitrobenzyl group is introduced into the initiators, flanked on one side by an adenosine and on the other side by either a disulfide bond or a free amino group. Under transcription conditions, the disulfide bond is reduced to generate a free thiol group. To demonstrate their utility, the initiators are used to prepare 5'-thiol and amino-labeled RNAs by in vitro transcription under the T7 Φ2.5 promoter. RNA labeling yield can reach 80-90%. Under irradiation of 360 nm photons, photocleavage of both the transcription initiators and the resulting RNA indicates a half-life of 6 min. We are currently using the transcription initiators to isolate new ribozymes that might have played important roles in the RNA world.

O2.10
11:00 REDOX REGULATION OF JAK2 IN PANCREATIC BETA ISLET CELLS

Chetan Patil, Barak Gunter, Roy Duhe
University of Mississippi Medical Center

Oxidative stress is associated with numerous metabolic and degenerative diseases. Our lab has discovered that that two residues (Cys866 and Cys917) act together as a redox sensor switch in the protein-tyrosine kinase JAK2, potentially allowing JAK2's catalytic activity to be directly regulated by

the redox state of the cell. This switch may play an important role in the development of type II diabetes, in which beta pancreatic islet cells exhibit impaired functionality after prolonged oxidative stress. JAK2 is an important transducer of insulin-, prolactin- and growth hormone- coupled signals in these cells. In order to show that the redox sensor switch functions under physiological and pathophysiological conditions, we will rescue oxidatively-impaired signal transduction in mammalian cells through the lentiviral expression of a recombinantly-engineered redox-refractive form of JAK2. We have generated lentiviruses expressing V5-tagged rJAK2 and the redox-refractive rJAK2(CC866,917AA), and confirmed their cellular production by immunofluorescence and western blot assays. To ensure that we can experimentally manipulate the intracellular redox environment through growth conditions which approximate physiological parameters, we have performed glutathione assays and flow cytometry measurements using redox-sensitive dyes. We observe that in murine beta pancreatic islet cells that we can manipulate the redox state to become more oxidizing by increasing glucose and oxygen levels. Through these efforts we have established a new cellular model for the study of diseases linked to chronic oxidative stress.

O2.11
11:15 THE ROLE OF ANTI-INFLAMMATION IN PREVENTING REMODELING OF THE HEART CAUSED BY HYPERTENSION

Bindiya Patel, David Murray
Univeristy of Mississippi

Hypertension produces an inflammatory response resulting in hypertrophy of the heart. In response to stress, there are cell-cell interactions which promote harmful structural changes in the heart. The hypothesis of this study is that tryptase derived from cardiac mast cells binds to protease activated receptor-2 (PAR-2) on fibroblasts resulting in the increase of expression of cyclo-oxygenase-2 (COX-2). Cyclo-oxygenase-2 causes the production of 15-d-PGJ_2, which in turn stimulates collagen production. Left ventricular samples were collected and analyzed from 14 day post SHAM operated, pressure overloaded (PO), and PO + Nimesulide treated rats. Expression of COX-2 increased in the PO groups compared to the SHAM groups. Treatment with Nimesulide in the PO groups attenuated COX-2 expression and nearly returned protein levels to SHAM values. Expression of PAR-2 appeared to increase in PO groups and decrease in the PO + Nime treated groups, but these values were not normalized to GADPH due to the short time period allotted for this study. Treatment with the COX-2 inhibitor, Nimesulide, is expected to decrease COX-2 activity and therefore indirectly decrease the concentration of 15-d-PGJ_2 leading to a decrease in collagen production by fibroblasts.

11:30 ELECTION OF OFFICERS

(Chair and Co-Chair) for serving the Cell, Molecular, and Developmental Biology Division of the MAS in 2012

Biomedical Research: Respiratory Disease and Antibiotic Resistant Mechanisms

O2.13
1:15 ANALYZING THE FUNCTION OF THE MOLD-SPECIFIC GENE *M46,* IN THE DIMORPHIC FUNGUS *HISTOPLASMA CAPSULATUM*

Davida Crossley, Glen Shearer
The University of Southern Mississippi

Histoplasma capsulatum is the cause of the respiratory disease histoplasmosis. The dimorphic fungus grows in the soil as a multi cellular mold. Once the soil is disturbed, spores are released and are inhaled into the lungs. For pathogenesis it is a requirement that yeast convert to mold. To understand the molecular basis of dimorphism, we have isolated several mold-specific and yeast-specific genes. The subject of this study is the mold –specific *M46* gene. The function of M46 is unknown. According to Genbank, there is an *M46* homolog in three fungi. However the function of M46 in these organisms is also unknown. Northern blot analysis has shown that *M46* is expressed in G186AS and Downs strains, but is transcriptionally silent in G184AS and G217B strains. The reason for lack of transcription in the latter strains may imply that M46 is not involved in dimorphism. Localization analysis in which *M46* was fused to the reporter- Green Fluorescent Protein (GFP) on C- and –N- terminus regions, indicates that M46 is localized to the cytoplasm. Localization to the cytoplasm does not give a clear indication of the function of M46. Recently, an *M46* knockout has been constructed. This obvious knock out has shown to have no effect on the yeast phase morphology or growth rate when compared to the morphology and growth rate of wild type. Future work will consist of analyzing the *M46* knockout morphology and rate of growth in the mold morphotype and compare to wild type.

O2.14
1:30 OVEREXPRESSION OF GLUTATHIONE BIOSYNTHETIC GENES SUPRESS DIMORPHISM OF THE PATHOGENIC FUNGUS *HISTOPLASMA CAPSULATUM*

Melissa Adams, Glen Shearer
University of Southern Mississippi

The dimorphic fungus *Histoplasma capsulatum* is the causative agent of histoplasmosis, a disease that afflicts an estimated 500,000 Americans each year. Histoplasma grows in soil as a saprophytic multicellular mold. In the lungs of an infected host, a shift to the parasitic yeast occurs. The dimorphism from mold to yeast is regulated by many environmental factors such as temperature and thiol concentrations. Sulfhydryl groups (-SH), especially cysteine, are a necessary nutrient for the mold to yeast transition. Glutathione biosynthetic genes, Gamma-glutamyl cysteine synthetase (*GSH1)* and Glutathione synthetase (*GSH2)* use cysteine to make the tripeptide glutathione. Northern blot and RT-PCR analysis show *GSH1* and *GSH2* are weakly expressed in the mold morphotype and strongly upregulated in the yeast morhpotype. Overexpression analysis of *GSH1* and *GSH2* in the mold morphotype was used to study the role of glutathione synthesis in the dimorphism of histoplasma. Overexpression of *GSH1* and *GSH2* was driven by the strong *Hc* Tef1 promoter. The increased expression resulted in yeast cells that were unable to shift to the mold morphotype at 25°C. Studies are underway to measure glutathione levels as well as *GSH1* and *GSH2* expression in these transformants.

O2.15
1:45 *MSA* PLAYS ROLE IN ANTIBIOTIC RESISTANCE AND AUTOLYSIS IN *STAPHYLOCOCCUS AUREUS*

Gyan. S Sahukhal, Antony Schwartz, Mohamed O. Elasri
The University of Southern Mississippi

Msa is a putative membrane protein with three membrane-spanning regions that are potentially involved in interaction with the environment. We have shown that *Msa* regulates biofilm formation, antibiotic resistance and virulence. *Msa* mutant showed increased susceptibilty towards several β-lactams antibiotics. We have found that salt and Polyanethole sulfonate (PAS) affects the msa mutant's biofilm formation. Since salt and PAS have been implicated autolysis, we hypothesize that *Msa* plays role in this process. Triton-X 100 induced autolysis was triggered at higher rate in *Msa* mutant relative to wild type. *Msa* mutant also produced more extracellular DNA than wild type supporting higher rate of autolysis in the mutant. Rate of autolysis was also increased when exposed to sub-inhibitory concentrations of β-lactam antibiotics that were targeted towards penicillin binding proteins. Interestingly, *Msa* mutant gained resistant to lysostaphin induced autolysis relative to wild type.

O2.16
2:00 CHARACTERIZATION OF DELETION MUTANT OF *MSA* IN *STAPHYLOCOCCUS AUREUS*

Maria Basco
University of Southern Mississippi

Antibiotic resistance in *Staphylococcus aureus* is a growing world-wide issue in public health. *S. aureus* is resistant to major drugs like methicillin, vancomycin, and oxazolidinones. We have previously described the *msa* gene as a global regulator controlling biofilm formation and several virulence genes required for MRSA (Methicillin Resistant Staphylococcus Aureus) infections. These observations were made using a transposon-insertion mutant (with Tn*551*) in *S. aureus* strains COL, RN6390 and UAMS-1. To verify the role of *msa* and rule out any polar effects from the transposon, we have created a deletion mutant of *msa* in COL (MOE334) by allelic replacement; using the temperature sensitive plasmid pKOR1. MOE334 was verified by PCR and sequencing. Effects of the deletion of the *msa* gene were studied in lipase assay, protease assay, hemolytic assay and biofilm assay. The other effects of the deleted msa gene are still being studied. Future studies with MOE334 in pathological effects (using animal models), its role as a global regulator and in networking with other regulators like *sarA* and *agrA* (using RT-qPCR and double mutations) are next in the pipeline. Similar mutations are also being created in other strains like the RN6390 and UAMS-1 to see the role of *msa* across other strains of *S. aureus*.

Biomedical Research: Neuroscience

O2.17
2:30 NON-ESTERIFIED FATTY ACIDS (NEFAS) GENERATE DIFFERENT AB42 OLIGOMERS VIA TWO DISTINCT AGGREGATION PATHWAYS.

Rebekah Rice[1], Amit Kumar[1], Pritesh Patel[1], Lea C. Paslay[1], Dipti Singh[1], Ewa A. Bienkiewicz[2], Sarah E. Morgan[1], Vijayaraghavan Rangachari[1]
[1]University of Southern Mississippi, [2]Florida State University

In Alzheimer's disease (AD), soluble oligomers of amyloid-β (Aβ) are believed to be primary neurotoxic species responsible for early synaptic dysfunction and cognitive decline. The rate of Aβ aggregation is known to be significantly affected in the presence of anionic interfaces such as lipid, fatty acids & other surfactants. Here, we present the effect of saturated non-esterified fatty acids (NEFAs) on the rate of Aβ aggregation. We have observed that NEFAs induce more than one pathway of Aβ aggregation which is dictated by both ratio of Aβ42 : NEFAs as well as NEFAs respective critical micelle concentrations (CMC). More importantly, we observed that irrespective of their carbon chain lengths, NEFAs generate primarily two types of low molecular weight oligomeric species ; a) near CMC concentration, NEFAs increased the rates of Aβ aggregation towards fibril formation that generated 12-18mers, and b) at concentration above CMC, NEFAs failed to show any aggregation and generated 4-5mers, while oligomeric 12-18mers seems to adopt ‘on pathway' towards fibril formation, the 4-5mers formed via an alternate pathway called ‘off-pathway' that did not form fibrils. These oligomers generated were characterized using biophysical techniques like thioflavin-T (ThT) fluorescence, immunoblotting, atomic force microscopy (AFM) and circular dichroism (CD). All these data are presented and discussed.

O2.18
2:45 Isolation and characterization of two distinct Ab42 oligomers generated in the presence of non-esterified fatty acids (NEFAs).

Amit Kumar, Rebekah L. Rice, Lea C. Paslay, Sarah E. Morgan, Vijayaraghavan Rangachari
University of Southern Mississippi

The soluble oligomeric aggregates of amyloid-b (Ab) are the primary toxic species involved in the etiology of Alzheimer’s disease (AD). Due to their increased significance in AD pathology, it is important to explore and understand the molecular and structural properties of Ab oligomers. Previously, we have shown that non-esterified fatty acids (NEFAs) affect the rate of Ab aggregation. More importantly, we observed that irrespective of their carbon chain lengths, NEFAs generate primarily two types of low molecular weight oligomeric species ; a) near critical micelle concentration (CMC) concentration, NEFAs increased the rates of Ab aggregation towards fibril formation that generated 12-18mers, and b) at concentration above CMC, NEFAs failed to show any aggregation and generated 4-5mers. The oligomeric 12-18mers seems to adopt ‘on pathway’ towards fibril formation in contrast the 4-5mers formed via an alternate pathway called ‘off-pathway’ that did not form fibrils. We now report the detailed charcterization and isolation of these oilgomers. The oligomers generated in the presence of NEFAs were fractionated using size exclusion chromatography (SEC) and peak fractions were characterized using SDS-PAGE, dynamic light scattering (DLS), thioflavin-T (ThT) fluorescence and atomic force microscopy (AFM). The isolated 12-18mers remained stable for a period of 5-6 days and seed the aggregation of Ab. All these data further support our hypothesis of two distinct pathways of Ab aggregation.

O2.19
3:00 COMPETITION EXPERIMENTS SHOW THAT THE [URE3] PRION OF *SACCHAROMYCES CEREVISIAE* PUTS PRION-CONTAINING CELLS AT A GROWTH DISADVANTAGE

Jeremy Winders, Samantha McCorkle, Katherine Brinkman, Ross Whitwam
Mississippi University for Women

Prions are infectious proteins which, in mammals are associated with neurodegenerative diseases and have many features in common with non-infectious diseases such as Alzheimer's disease, Parkinson's disease, Huntington's Disease, and others. Yeast prions such as [URE3] serve as model systems for mammalian prions because they share many molecule features in common with them. However, unlike mammalian prions, the yeast prions are not associated with any disease states and while the [URE3] prion has been reported to slow yeast growth, the evidence is not strong. We show that, contrary to published reports, pure cultures of [URE3] yeast grow at exactly the same rates as prion-

free yeast in both nutrient-rich and nutrient-limiting media. However, when prion-containing [URE3] yeast are grown in direct competition with prion-free yeast in the same culture, the prion-free yeast out-grow the prion-containing [URE3] yeast and eventually come to dominate the culture. This is the first time the [URE3] prion has been shown to have a deleterious effect on its host and suggests that the [URE3] system may be used to model certain aspects of the disease states of mammalian prions as well as their molecular features.

O2.20
3:15 EFFECT OF SCOPOLAMINE AND SCHIZANDRIN ON SPATIAL LEARNING IN ZEBRA FINCH'S

Diarria Williams, Madeline Coltharp, Brittany Simpson, Lainy Day
University of Mississippi

The cholinergic system, diminished in Alzheimer's, is important in memory. We tested the effects of scopolamine and the natural product schizandrin on spatial learning in zebra finches. Scopolamine is a drug known to impair spatial learning in mammals but has not been widely tested in birds. However, schizandrin has been found to improve scopolamine induced deficits in spatial memory - specifically in rats. To confirm these findings, we tested the role of both drugs in a spatial learning task. The birds were trained in a spatial escape maze developed in our lab. The subjects were required to escape through a hole 2.5cm above the floor of a Plexiglas cylinder that was sitting on a hot plate. We tested the birds in 5 treatment groups (n=3 per group): low schizandrin (LSZ) (10mg/kg), high schizandrin (HSZ) (20mg/kg), low scopolamine (LSP) (0.05mg/kg), high scopolamine (HSP) (3mg/kg), and controls. Path distance, duration, and velocity were recorded using Ethovision (Noldus). Using repeated measures ANOVA, we did not find any significant differences between the treatment groups in duration, distance, or velocity. We did find a marginally significant difference in distance ($p>0.09$) and in duration ($p>0.10$) between the HSP and the HSZ group using t-tests to make paired comparisons. We will be performing a follow up experiment to further examine differences between HSZ (20mg/kg), HSP (3mg/kg), and controls.

O2.21
3:30 A GENETIC MODIFIER SCREEN OF MIDLINE IDENTIFIES ENHANCER AND SUPPRESSOR GENE CANDIDATES THAT REGULATE INTEROMMATIDIAL BRISTLE FORMATION IN THE ADULT DROSOPHILA EYE

Deepak Kumar, Sandra Leal
University Of Southern Mississippi

The *Drosophila* T-box transcription factor *midline* (*mid*) regulates cell-fate specification in multiple tissues across diverse species including mammals. However, to date, the complex mechanisms by which *mid* regulates cell-fate specification are not completely understood. Expression studies between Mid proteins and transcription factors known to specify motor neuron and interneuron fates within the central nervous system (CNS) reveal little co-expression between these factors. Consequently, we are using a classical genetic modifier screen and RNA interference (RNAi) methodology to identify genes that suppress or enhance a dosage-sensitive RNAi bristle phenotype observed in the adult *Drosophila* eye when *midline* transcripts are reduced in the eye imaginal discs of third-instar larvae. This high-throughput screening approach facilitates efforts to identify *mid*-interacting genes that potentially regulate cell-fate specification within the *Drosophila* eye and within the embryonic central nervous system (CNS). Presently, we have identified several third chromosomal regions harboring enhancer and suppressor candidate genes that regulate interommatidial bristle formation within the adult eye. We are currently assaying mutant alleles of these prospective enhancer/suppressor gene candidates to identify bona fide *mid*-interacting genes. We then propose to understand how these newly identified genes regulate *midline* function in the context of both eye and embryonic CNS development. This research will further our understanding of *mid* function as an integral regulator of cell-fate specification pathways.

Concurrent Afternoon Session

GENOMICS SYMPOSIUM organized by Dr. Sittman (UMMC)
Room 218 A

1.15-1.20 pm: Opening Remarks
1.20-1.40 pm: Dr. Phi Do, UMMC
Mutant p53 : A Multi-Platform Approach to Identifying its Role in Cancer and Drug Resistance

1.40-2.00 pm: Dr. Lakshman Varanassi, UMMC
E2F3 and the DNA damage response: How genomics enables discovery

2.20-2.20 pm: Dr. Shane Burgess and Dr. Fiona McCarthy, MSU
Gene Ontology annotation and modeling

2.20-2.40 pm: Dr. Shane Burgess and Shyamesh Kumar, MSU
Expression-Proteomics-based systems biology modeling in a unique naturally-occurring Hodgkin's lymphoma model

2.40-3.00 pm: Dr. Sukumar Saha, USDA/ARS
Genomic resources in cotton improvement

3.00-3.20 pm: Dr. Sarah Buxbaum, JSU/JHS
Genetics of QT interval duration in the Jackson Heart Study

3.20-3.30 pm: Concluding Remarks

February 18, 2011
FRIDAY MORNING

9:00-10:30 POSTER SESSION

P2.01
MOLECULAR DETECTION OF TICK-BORNE PATHOGENS IN MIGRATORY BIRDS

William D'Angelo, Michael Sellers, Frank Moore, Shahid Karim
The University of Southern Mississippi

Ticks and tick-borne pathogens can be transported over large distances and across geographical barriers by avian hosts. During the spring migrations of 2009 and 2010, blood samples were collected from 282 passerine birds (30 in 2009, 252 in 2010) at a migration stop-over observatory in Johnson Bayou, Louisiana. Every bird was identified by species and examined for ticks. Ticks found attached to the birds' bodies were removed, identified by species, and stored in individual vials in 70% ethanol. Blood collected from the birds was immediately stored in lysis buffer. Genomic DNA was extracted from the bird blood samples and the ticks using a Qiagen DNA extraction kit. We performed nested polymerase chain reaction using 16S rRNA gene and VLPT gene primers to screen the samples for the bacterium *Ehrlichia chaffeensis*, an emerging tick-borne pathogen that causes a febrile illness in humans. Evidence of *E. chaffeensis* infection was found in 15 birds.

P2.02
DETERMINATION OF COPY NUMBER OF *HISTOPLASMA CAPSULATUM LIGD* (*LIG4* HOMOLOG)

Lacey Howard, Glen Shearer
University of Southern Mississippi

Histoplasmosis, the most prevalent cause of respiratory mycoses in humans, is caused by the dimorphic fungus *Histoplasma capsulatum* (*Hc*), which can be found in the mold form in micropockets of soils that are heavily fertilized by bird excrement or in the pathogenic yeast form in the lungs of mammals. *Hc* exists in the mold form at 25˚C and in the yeast form at 37˚C. In order to elucidate the mechanisms that control the mold to yeast phase transition, which is required for pathogenicity, genetic knockout mutants of target genes of *Hc* are created to study the effect of loss of function of these genes. However, *Hc* allelic replacement attempts most often result in ectopic insertions, presumably because of non-homologous end joining (NHEJ) repair of DNA. *LigD* is a DNA ligase that assists in the NHEJ pathway with the assistance of the heterodimer *Ku70-Ku80* and the MRX protein. Recent reports in the literature showed that disrupting *ligD* in *Aspergillus oryzae* dramatically enhances the efficiency of allelic replacement. We hypothesize that disrupting the *ligD* homolog in *Hc* will likewise enhance the efficiency of genetic knockouts in this fungus. To test this hypothesis, we have isolated the *Hc ligD* homolog (*HcligD*) from strain G186AS. Sequence analysis indicated this gene encodes a predicted protein of 705 amino acids. Southern blot analysis indicated that *HcligD* is a single copy gene. Experiments are underway to knockout *HcligD* in order to study the effects of this loss of function on allelic replacement.

P2.03
THE ROLE OF DNA METHYLATION IN THE PATHOGENIC FUNGUS *HISTOPLASMA CAPSULATUM*.

Rupesh Patel, Glen Shearer
The University of Southern Mississippi

Histoplasma capsulatum is a dimorphic fungus found as a saprophytic mold in soils contaminated with bird or bat excreta (at 25 ^{o}C). When disturbed, the released spores have the potential to be inhaled into the lungs. In the lungs, at 37 ^{o}C, the multicellular fungus converts into a unicellular yeast, which is the causative agent for a

respiratory infection known as histoplasmosis. Researchers are interested in studying the molecular aspects of the conversion to provide more effective treatment routes. This study is unique because it is a whole-genome based study instead of a single gene study. On going studies in other organisms indicate that DNA methylation plays a crucial role in genetic expression. DNA methylation typically decreases gene transcription; which is essential for normal development and required for the differentiation of cell types. However, there are no previous methylation studies in *Histoplasma capsulatum*. Hence, the main objective of this project is to assess the role of DNA methylation in *Histoplasma capsulatum*. To achieve this, genomic DNA was extracted from both the yeast and the mold forms of the Downs strain. Thereafter, the genomic DNA was digested with the isoschizomers *HpaII* and *MspI*. As an independent assay of DNA methylation, *Histoplasma capsulatum* (Downs strain) was grown in the presence of the cytosine analogue, 5-Azacytidine. Furthermore, DNA methylation will be quantitatively analyzed using an enzyme linked immunosorbent assay (ELISA).

P2.04
CHARACTERIZING POPULATIONS OF DOUBLE-STRANDED RNA IN *KARENIA BREVIS* PRESENT AT DIFFERENT TIMES OF THE DIEL CYCLE

Scott Anglin, Timothy McLean
The University of Southern Mississippi

Karenia brevis is a mixotrophic, marine dinoflagellate found in the Gulf of Mexico that generates periodic, if not annual, harmful algal blooms (also known as 'red tides') in certain coastal areas. In an effort to better understand the biology of this organism, a functional genomics project has been initiated. As part of that project, it has been determined that a significant number of natural antisense transcripts (NATs) as well as double-stranded RNA (dsRNA) molecules exist within the transcriptome of *K. brevis*. The purpose of this research is to determine if dsRNAs play a role in regulating gene expression. The methods involved in this procedure include extracting total RNA from cells grown under different culture conditions, isolating and cloning the dsRNAs, and sequencing a representative sample of each clone library. We will assess the relative level of expression of the most abundant genes under the tested conditions. Any differential expression between conditions will support the hypothesis of dsRNAs regulating the expression of genes via a post-transcriptional mechanism. The results of these experiments will possibly lead to a better understanding of environment-gene interactions for this organism, which, in turn, will aid our ability to understand the factors and mechanisms associated with cell growth and bloom formation.

P2.05
A GENETIC MODIFIER SCREEN IDENTIFIES MIDLINE-INTERACTING GENE CANDIDATES IN DROSOPHILA

Jason Wheat, Deepak Kumar, Sandra Leal
University of Southern Mississippi

We are undertaking two comprehensive genetic modifier screens to identify mid-interacting genes to confirm the hypothesis that midline (mid) is an essential member of a novel transcription factor combinatorial code mediating cell-fate specification in the embryonic CNS (Tatum et al., 2010, MAS Research Conference; companion poster). We present the results of the first ongoing genetic modifier screen that assays a dosage-sensitive adult mutant eye phenotype observed when midline transcripts are reduced in the developing third instar larval eye discs of hundreds of chromosomal deficiency lines. Gene candidates identified from this screen will be subjected to a second modifier screen assaying a CNS-specific mutant phenotype. This classic genetic approach will uncover novel midline-interacting genes essential for regulating cell-fate specification in the CNS and developing eye. Preliminary findings are encouraging and have identified a genomic interval harboring mid-interacting genes. These gene candidates also have the potential to regulate the acquisition of normal locomotor adult behaviors (Solomon et al., 2010, MAS Research Conference; companion poster). Current research in the Leal lab is focused on identifying the mid-interacting gene(s) and investigating whether this gene or genes affect the development of neural circuits that support locomotor activity or specific aspects of neurotransmission in third instar larvae and adult fruit flies.

P2.06
THE IDENTIFICATION OF GENES REGULATING MOTOR BEHAVIORS IN DROSOPHILA MELANOGASTER

Melinda Solomon, Katherine Warren, Jason Wheat, Sandra Leal
Oak Groove High School

Neural networks relay electrochemical signals with remarkable speed and accuracy to mediate simple and complex behaviors. The precision of this relay system depends upon the proper development of the central nervous system (CNS) when hundreds upon thousands of diverse neurons are born at "the right time and place" to build circuits. The disruption of neural circuits can result in devastating consequences and severe neurological and neuropsychiatric disorders in humans including epilepsy, schizophrenia, and depression. During a genetic screen to identify genes that are important for regulating neuronal differentiation during early embryogenesis in the fruit fly (Drosophila melanogaster), we uncovered a genomic interval on the third chromosome that harbors one or several genes that affect locomotor behaviors. Specifically, we observe that adult flies that are heterozygous mutant for genes within this genomic interval, exhibit deficits in locomotion, geotactic behaviors and the righting reflex. They also appear to be sensitive to "banging" or being tapped physically on a flat surface. After tapping, the adult flies exhibit a paralytic behavioral phenotype. We are currently examining the development of the embryonic CNS of these heterozygous mutants as well as mutants that completely lack the genomic interval (homozygous mutants) (Wheat et al., MAS Research Conference, 2011; companion poster presentation). Current studies in the Leal lab are identifying the gene or genes within the identified genomic interval that are essential for modulating normal locomotor activities.

P2.07
THE DROSOPHILA INOSINE TRIPHOSPHATASE GENE REGULATES EMBRYONIC CNS DEVELOPMENT

Katherine Warren, Jonathan Buchanon, David Merrill, Sandra Leal
University of Southern Mississippi

Recently, we identified a gene from a chromosomal deficiency screen, Inosine triphosphatase (ITPase) that is essential for regulating the proper formation of the *Drosophila* nerve cord. Our preliminary studies suggest that ITPase is essential for regulating the morphological integrity, outgrowth and pathfinding behaviors of axons that comprise the longitudinal connectives of the embryonic nerve cord. Deciphering the unique regulatory properties of the ITPase gene in the context of CNS development will reveal new insights into the molecular and genetic nature of axon guidance mechanisms important for the formation of basic neural circuits. Moreover, the fruit fly and human ITPase genes share remarkable structural and functional similarity; a small segment of the human population carries a nucleotide polymorphism for an altered form of the ITPase (P32T mutation). These individuals poorly tolerate azothioprine treatment, a purine analog and commonly prescribed immunosuppressive drug. As such, we administered azothioprine systemically to wild-type and ITPase heterozygous mutant adult flies to determine if we could phenocopy the toxicity observed in human patients. We monitored adult survival rates and basic locomotor behaviors as indicative measures of toxicity. However, we did not observe any lethal effects. We are currently assessing whether fruit fly mutant larvae are more sensitive to azothioprine treatment and also devising a genetic approach to create ITPase CNS-specific conditional knockouts via an RNAi approach and the UAS-Gal4 binary expression system. These conditional knockouts will confirm that the ITPase is required for supporting normal neuronal function within post-embryonic stages of *Drosophila* development.

P2.08
AN UNBIASED GENETIC MODIFIER SCREEN IDENTIFYING MIDLINE-INTERACTING GENES IN DROSOPHILA

April Tatum, Deepak Kumar, Jason Wheat, Samuel Muller, Andrew Meriwether, Sandra Leal
University of Southern Mississippi

The central nervous system (CNS) of *Drosophila melanogastor* is comprised of hundreds of diverse neurons. Presently, the genes that specify the fates of these differentiated post-mitotic neurons have not yet been completely identified. However, studies in Drosophila and vertebrate systems have revealed that conserved sets of transcription factor genes specify the identities of different classes of motor neurons and these precise observations led to the postulation of the combinatorial code model for neuronal specification. To decipher transcription factor codes that specify neuronal identities, a chromosomal deficiency screen was undertaken to

find genes that modify the expression of even-skipped (eve), a transcription factor gene and well characterized determinant of CNS neuronal fates. From this screen, the T-box transcription factor midline (mid) was identified as a new combinatorial transcription factor code member (Leal et al., 2009). We are currently undertaking two comprehensive genetic modifier screens to identify mid-interacting genes to confirm the hypothesis that mid is an essential member of a novel transcription factor combinatorial code mediating cell-fate specification in the embryonic CNS. The first genetic modifier screen assaying a dosage-sensitive mutant eye phenotype observed when mid transcripts are reduced in the developing eye of hundreds of heterozygous chromosomal deficiency mutant fly lines is providing encouraging results and potential mid-interacting genes. These gene candidates will then be assayed via a second modifier screen to determine whether they regulate cell-fate specification within the embryonic CNS.

P2.09

MECHANICAL AND CHEMICAL STIMULATION OF THE VAGAL AFFERENT NERVES REGULATING COUGH

Chioma Udemgba, Jackie Smith, Yang-ling Chou, Brendan Canning
The Johns Hopkins Asthma and Allergy Center, Bayview Campus

The cough reflex is a vital reflex mechanism necessary for keeping the respiratory system safe from aspirate. In both humans and animals, this reflex can be evoked by various mechanical and chemical stimuli. In order to develop more effective treatments for cough, additional information must be known about how this reflex is initiated in the airways and about the neurological pathways by which it is induced. This project targeted the vagal afferent nerves that regulate the cough reflex innervating the trachea of anesthetized guinea pigs. Attempts at evoking cough were carried out in guinea pigs by subjecting them to various mechanical stimuli and by applying citric acid topically to the tracheal mucosa (used routinely in clinical studies of the cough reflex). Although cough was routinely observed during surgical preparation of the airways and in response to mechanical probing of the mucosa, none of the mechanical stimuli studied here reliably evoked coughing. By contrast, citric acid evoked coughing upon topical application to the tracheal mucosa and was shown to be substantially reduced by topical pretreatment with FK506, an inhibitor of the phosphatase, calcineurin. From these results we conclude that particulate and acidic aspirate is likely initiators of cough whereas airways obstruction is unlikely to cause coughing. The results also suggest that a regulator of cough receptor excitability, perhaps the alpha3 subunit of the Na+-K+-ATPase (Bertorello et al., Proc Natl Acad Sci U S A. 1991; 88(24):11359-62; Mazzone et al., J Neurosci. 2009; 29(43):13662-71), may be negatively regulated by phosphorylation.

P2.10

β-TUBULIN CLASSES II AND III ARE DIFFERENTIALLY REGULATED IN MCF7 BREAST CANCER CELLS

Sharon Lobert, Bianca Jefferson, J. Graham Hudson, Kevin Morris
University of Mississippi Medical Center

The effectiveness of taxanes for the treatment of solid tumors is reduced because some tumors are initially resistant or become resistant to taxanes after repeated cycles of chemotherapy. Taxanes interact with β-subunit of the αβ-tubulin heterodimer and stabilize microtubules of mitotic spindles. It has been proposed that changes in amounts of β-tubulin isotypes or microtubule interacting proteins could contribute to drug resistance. We investigated changes in β-tubulin isotypes and MIPs in response to paclitaxel in MCF7 and MDA-MB-231 breast cancer cells. We chose these cell lines because MCF7 cells are known to express wild type tumor suppressor p53, whereas MDA-MB-231 cells express a mutated inactive form. We demonstrated previously that these two cell lines express primarily β-tubulin classes I, IV and V (Hiser et al., 2006, Cell Motil Cytoskel, 63:41-52). Because MCF7 cells express wild-type tumor suppressor protein p53, we performed siRNA experiments to reduce p53 protein levels and test for changes in β-tubulin class III levels. We found that p53 protein and β-III tubulin levels increase with paclitaxel treatment. When p53 levels are reduced or absent, β-tubulin class III protein is also reduced. We conclude that regulation of β-III tubulin is, in part, determined by active p53 in MCF7 cells.

P2.11
THE EFFECT OF MODELED MICROGRAVITY ON MACROPHAGE GENE EXPRESSION

Demitrius Boyson, Jasmine Washington, Ming Shenwu, Jinghe Mao
Tougaloo College

The effects of spaceflight on the infectious disease process have been studied at the level of the host immune response and indicate a blunting of immune mechanism. However, it is not clear whether exposure to space environment will alter the genetic and physiological properties of immune cells. The increased risk of muscular atrophy, bone demineralization or cancers may result from immune dysfunction caused by the interaction of space flight factors (e.g., radiation, microgravity, stress, isolation, extreme environments et al.). The risk may be influenced by immune dysfunction, latent viral infections, or host genetics. In particular, latent viruses (e.g., Epstein-Barr virus, herpes simplex, polyomaviruses, and hepatitis viruses) can become active and potentially initiate tumor formation. To better understand the effect of microgravity on macrophage inflammatory response, RT² Profiler™ PCR Array has been employed to profile the expression of 84 key genes involved in inflammatory cytokines & receptors of the RAW 264.7 murine macrophage cell line. Our results revealed changes in the expression of several genes including Ccl12 (3.2 fold), Cd40lg (2.2 fold), Ccr2 (-7.7 fold), Il6ra (-2.2 fold) and Ltb (-3.7 fold) in macrophages grown under modeled microgravity (MMG) for 48 hours using high-aspect-ratio rotating-wall vessel bioreactor (HARV). Our results indicated that the macrophage gene expression profile was altered by microgravity; especially down-regulation of genes essential in skeletal muscle regeneration (Ccr2), up-regulation of genes necessary for initiating the atherosclerosis (Cd40lg) and genes mediating immunosuppression in tumors (CCL2).

P2.12
IDENTIFICATION OF GENES DIFFERENTIALLY EXPRESSED IN ELONGATING FIBER IN A COTTON CHROMOSOME SUBSTITUTION LINE CS-B25

Samuel Bandi, Din-Pow Ma
Mississippi State University

Recently 17 interspecific chromosome substitution lines (CS-B lines) of upland cotton in *G. hirsutum* TM-1 background containing whole chromosomes or chromosome arms of *G. barbadense* (line 3-79) chromosomes have been developed and released to the public. These lines are genetically identical except that each differs by the replacement of a specific homologous pair of chromosomes from 3-79 (*G. barbadense*) into the Upland background. The 17 CS-B lines carry alleles with positive effects on fiber traits and some with negative effects. The CS-B25 line, which has chromosome 25 from *G. barbadense* substituted into TM-1, exhibits fiber with increased fiber length, strength, and lower micronaire which are all positive traits for fiber quality. Additionally CS-B25 yields are similar to TM-1. These results form a solid base that allows us to compare gene expression between CS-B25 and TM-1 lines during different stages of fiber development. In this study Affymetrix cotton genome arrays and subtraction hybridization have been used to identify up- and down-regulated genes in elongating fiber in CS-B25 in comparison to TM-1. This approach will ultimately allow us to identify cotton genes on the chromosome 25 of *G. barbadense* 3-79 which are associated with fiber quality traits.

P2.13
EXPRESSION OF *Trametes elegans* WOOD DECAY ENZYMES ON DIFFERENT DURABLE WOODS DURING DECAY IN FOREST SOIL

Min Lee[1], Young-Min Kang[2], Lynn Prewitt[1]
[1]Mississippi State University, [2]USDA-ARS, Genetic Research Unit, Cornell University

The understanding of microbial decay processes on wood in a forest soil is an important issue for maintaining healthy forest systems. The primary biotic wood decomposers are white rot and brown rot fungi called basidiomycete which degrade all wood components (cellulose, hemicellulose, and lignin) in order to obtain food sources. A common white rot fungi, *Trametes elegans*, was identified and detected on different durable woods (pine, cedar, and ACQ-treated pine) during a 26 month soil bed decay test. The objective of this study was to determine gene expression of wood decay enzymes lignin peroxidase (*Lip*), manganese peroxidase (*Mnp*), and laccase (*Lcc*) in *T. elegans* on pine (decay non-resistant wood), cedar (naturally decay resistant), and alkaline copper quaternary (ACQ) treated pine (chemically treated decay resistant). Total RNA was

extracted from wood samples at 0, 4, 10, 18, and 26 months of decay, and then converted to cDNA. Real-time PCR was used to quantitate gene expression levels of *Lip*, *Mnp*, and *Lcc* genes of *T. elegans*. Basidiomycete specific 18s rRNA gene was used as an internal gene and detected on all wood samples. At 10 and 18 months, only *Mnp* was detected on all wood types. The *Mnp* expression level was higher on cedar than pine and ACQ-treated pine. *Lip* was present only on ACQ-treated pine, and *Lcc* was not detected on any of the woods. At this time, results indicate that the woods of different durability influence the type and amount of wood decay enzymes produced during decay.

11:15-11:45 Awards Ceremony for Best Oral Presentations and Best Poster Presentations

FRIDAY AFTERNOON
Room 216

1:15-3:40 Infectious Diseases Symposium

CHEMISTRY AND CHEMICAL ENGINEERING
Chair: Ramaiver Venjatraman,
Jackson State University
Vice-chair: Hossain Alamgir,
Jackson State University

THURSDAY MORNING
Room 218B

8:50 WELCOME

O3.01
9:00 USE OF COMBINED HPLC-MS TECHNIQUES TO OPTIMIZE PLE REACTION CONDITIONS

Maureen Smith[1], Souvik Banerjee[1], Yongliang Shi[1], Marlen Schmidt[3], Uwe Bornscheur[2], Douglas Masterson[1]
[1]The University of Southern Mississippi, [2]Greifswald University, [3]Enzymicals AG

Enzymes, such as Pig Liver Esterase (PLE), are commonly used in organic synthesis due to their low cost, stability, and ability to hydrolyze a wide range of substrates. PLE is composed of a mixture of at least 6 different isoenzymes, which have recently been isolated. However, the role of each individual isoenzyme in the PLE mixture has not been determined thus far. It has been demonstrated that the addition of organic co-solvents to the aqueous buffer can dramatically alter the enantiomeric excess (ee) of the hydrolysis reaction. While this effect has been studied with crude PLE, it has not been studied with the individual isoenzymes. In this study, compounds (**1**) and (**2**) are hydrolyzed while varying the co-solvent content of the buffer and the enzyme used (crude PLE or isoenzyme). The resulting products were then analyzed using a combination of HPLC-MS techniques developed in our lab. Using this method, the enantiomeric excess of compound **1** was improved from 23 %ee to 85 %ee with the addition of the appropriate co-solvent. Additionally, compound **1** was hydrolyzed with isoenzyme 1, resulting in an improvement from 85 %ee to 95 %ee with the same co-solvent. Interestingly, addition of co-solvent to several of the isoenzymes (3-6) resulted in a solvent induced inversion of chirality. For example, for isoenzyme 6, the *(S)*-enantiomer was formed without cosolvent in 53 %ee. Upon addition of co-solvent, the *(R)*-enantiomer was formed in approximately 58 %ee. These results and the results of the other isoenzymes and co-solvents will be discussed.

O3.02
9:30 A METHODOLOGY FOR SYNTHESIZING NUMEROUS UNNATURAL LYSINE ANALOGUES FROM A COMMON OPTICALLY PURE SYNTHON

Souvik Banerjee, Maureen Smith, Douglas Masterson
The University of Southern Mississippi

Our goal is to synthesize enantiomerically enriched α-methyl lysine analogues from a common synthon. Enzymatic hydrolysis (using PLE) of achiral compound diethyl-2-methyl-2-((1, 3-dioxoisoindoline-2-yl) methyl) malonate (phthalimido protected α-methyllysine diester) gives us 2-(ethoxycarbonyl)-2-((1, 3-dioxoisoindolin-2-yl) methyl) Propanoic acid (phthalimido protected α-methyllysine halfester) with high optical purity. Our synthetic strategy allows us to vary the "R" group of lysine from 1-5 methylene units and backbone of lysine as well from "α" to "β" to "γ", from the same common synthon. We have been able to get high optical purity in case of enzymatic hydrolysis of α-methyllysinediesters with 2, 3 and 4 methylene group in the side chain. Out of them 1, 3 and 4 Carbon lysine half-esters are predominantly with "R"

enantiomers. We have also been able to obtain highly enantimerically enriched (ee 93%) t-Boc-Fmoc protected α-methyl-α-Lysine and hetero nuclear protected α-methyl-β-Lysine ester from the same common synthetic intermediate. Our research strategy will be discussed in detail.

O3.03
10:00 DETECTION OF NANOPARTICLE STABILITY: FRACTINATION OF CADMIUM AND CADMIUM SELENIDE NANOPARTICLES IN ANIMALS TISSUES

Zikri Arslan, Mehmet Ates, Wanaki McDuffy
Jackson State University

Nanoparticles of CdSe are of serious health concern because of the presence of toxic cadmium. A critical but still an unknown point is the metabolic stability of the CdSe NPs in the body. Unstable NPs release free Cd that accumulates in the liver and kidney with an average half life of 15 years in the body. However, detection of free Cd from tissues is challenging task without decomposing NPs. In this study, we developed a procedure to determine levels of free Cd and CdSe NPs from liver and kidney samples of rats to understand stability in the body. Sprague Dawley rats were exposed to CdSe nanoparticles. The liver and kidney were removed after sacrificing the animals. Organs were solubilized in tetramethyl ammonium hydroxide (TMAH) to extract intact CdSe NPs and free Cd. Nanoparticles decomposed when treated in 1% HCl to produce free Cd, but were stable in 25% TMAH under heat. Extraction of Cd from tissues by TMAH was validated with Dogfish Liver CRM (DOLT-4) and then applied to the liver and kidney samples from Sprague Dawley rats exposed CdSe NPs. ICP-MS analysis showed that total Cd content was higher in the liver but free Cd was consistently higher in the kidney. This result indicates that CdSe NPs are prone to metabolic degradation to yield free Cd in the body. Higher levels of free Cd in the kidney could be due to preferential accumulation or gradual mobilization of Cd in the liver to the kidney.

10:30 BREAK

O3.04
10:45 NOVEL CHEMOTHERAPEUTIC AGENTS OF VANADIUM(IV) WITH THIOSEMITHIOCARBAZONES AND SCHIFF BASES AS LIGANDS: STRUCTURAL ASPECTS AND *IN VITRO* STUDIES

Nerissa Lewis[1], Fang Liu[5], Tony Magnusen[1], Travis Erves[1], Faye Arca[1], Floyd Beckford[3], Ramaiyer Venkatraman[2], Antonio Gonzalez Sarrias[4], Liya Li[4], Suman Parajuli[1], Navindra Seeram[4], Aimin Liu[5], William Jarret[1], Wujian Miao[1], Alvin Holder[1]
[1]University of Southern Mississippi, [2]Jackson State University, [3]Lyon College, [4]University of Rhode Island, [5]Georgia State University

A series of novel mixed-ligand vanadium (IV) complexes containing thiosemicarbazones and Schiff bases as ligands were synthesized and characterized. The novel complexes were characterized by elemental analysis, ESI MS, IR, UV-visible, EPR, and ^{1}H and ^{13}C NMR spectroscopy, and electrochemistry. ^{51}V NMR spectroscopy was used to prove that vanadium(V) species were formed in DMSO solutions on standing at room temperature. *In vitro* studies were carried on three colon cancer cell lines, viz., HTC-116, Caco-2, and HT-29, with a comparative anti-proliferative activity on non-cancerous colonic myofibroblasts, CCD18-Co. All three compounds exhibited less inhibitory effects in human normal CCD-18Co cells, indicating a possible cytotoxic selectivity towards colon cancer cells. In general, those compounds which exhibited anti-proliferative activity on cancer cells but did not affect normal cells may have a potential in chemoprevention.

O3.05
11:15 QUANTIFICATION OF HOMOCYSTEINE BY USING LIGAND DISPLACEMENT METHOD

Xiaoxia Li[1], Dongmao Zhang[1], Siyam Ansar[1]
[1]Mississippi University for Women, [2]Mississippi State University

Organo thiol such as homocysteine, cysteine and glutathione are implicated in a variety of physiological and pathological roles. Current analytical methods for determination of organothiol are dominantly MS and/or HPLC based that involves costly equipment and tedious sample preparation. Using homocysteine (Hcy) as a model organothiol, we have recently developed a novel, UV-vis based method, which we called ligand displacement method (LDM) for label-free quantification of organothiol in solution. With this method, known amount of probe ligand that is mercaptobenzimidazole (MBI) in our experiment, is first mixed with a sample solution containing Hcy, and then the known amount of mixture is added to gold nanoparticle of known concentration. Because of Hcy competes with MBI for the AuNP surface, the concentration of Hcy in

solution can be deduced according to amount of reduced MBI adsorption onto AuNP. Current quantification limit is ~3 mM and with a dynamic range up to 60 mM. Compared to existing Hcy detection method, this ligand displacement method is accurate and easy to perform.

THURSDAY AFTERNOON

INVITED SYMPOSIUM

O3.06
1:30 MULTIFUNCTIONAL BRANCHED GOLD NANOSTRUCTURES FOR IMAGING AND THERAPY OF BIOLOGICAL TOXIN

Paresh Ray, Dulal Senapati, Sadia Khan, Wongton Lu, Anant Singh
Jackson State University

Past couple of decades one of the most important goals of nano-science, is the design of materials with tailored shape and size, driven both by the excitement of understanding new science and by the potential hope for applications and economic impacts. Here we will discuss synthesis of different shapes of gold nanoparticles and the mechanisms on how shape control works . We will also discuss our recent reports on the use of antibody and aptamers-conjugated nanotechnology-driven approach using branched shape gold nanoparticle to selectively target and destroy pathogenic bacteria and different cancer cells. The mechanism of selectivity and photothermal lysis will be discussed. Our experimental results will be discussed here open up a new possibility of rapid and reliable diagnosis of pathogen bacteria and cancer cell lines using multifunctional gold nanosystems. Ideally, our nanotechnology based reported assay would have enormous potential for rapid, on-site detection capability to avoid distribution of contamination and it may be the next avenue for exploration.

O3.07
2:30 PHOTOCHEMISTRY AND PHOTOTOXICITY OF POLYCYCLIC AROMATIC HYDROCARBONS

Hongtao Yu
Jackson State University

Polycyclic aromatic hydrocarbons (PAHs) are components of crude oil, and a large quantity of PAHs may have been released into the environment during the Gulf Oil Spill. PAHs can induce mutations and lead to tumor formation via metabolic activation in the body. Photochemically, PAHs can produce reactive species which induce damages to the cellular proteins, DNA, and lipids. The phototoxicity is related to the photochemical reaction of the PAHs and reactive species formed during photolysis, which are determined by the intrinsic PAH structure, solvent used, co-existing chemicals, and light sources. Therefore, identification, characterization, and remediation are of great concern. Photoreaction of PAHs mainly produces oxygenated compounds in aqueous solutions, and the structure of the products depends on the structure of the PAHs, i.e. how the rings are arranged. The phototoxicity of PAHs in skin cells is directly related to its excited state property such as the excited state singlet/triplet energy or the HOMO-LUMO gap. The potency of a PAH to cause light-induced DNA cleavage also depends on the HOMO-LUMO gap as shown in methyl substituted benz[a]anthracenes (MBAs). Light-induced lipid peroxidation by MBAs shows that it does not correlate to the HOMO-LUMO gap as does the light-induced DNA single strand cleavage.

3:30 BREAK

O3.09
3:45 APPLICATIONS OF PHOTOINDUCED N-O BOND CLEAVAGE IN NITROGEN ONIUM-SALTS

Wolfgang Kramer, Emily Stewart, Woods Curry, Austin Baker, GeNita Finley, Malika Shettar
Millsaps College

The goal in our lab is the design, synthesis and testing of a photodynamic therapy reagent that does not rely on oxygen in the tissue. All FDA approved photodynamic therapy drugs are singlet oxygen sensitizers which is reducing their efficiency in highly hypoxic tumor tissues. Our approach uses the photofragmentable nitrogen-oxygen bond of a nitrogen onium salt derived from aromatic heterocycles. The photoreaction yields two transient species, an alkoxy radical and an aromatic radical cation. The cleavage efficiency is about 0.6, determined by laser flash photolysis trapping experiments. A new method to monitor the efficiency is the pH control of the irradiation solution. Both of the transient species have been shown to cleave DNA, each with a different mechanism. To increase ground-state with DNA and ultimately DNA

cleavage, a known DNA binder, 1,8-naphthalimide was synthetically attached. DNA binding is determined by titrations monitored by UV/VIS, fluorescence and CD spectroscopy. The results are used to optimize the synthesis of further bifunctional nitrogen onium salts. The DNA cleaving efficiency is tested with supercoiled plasmid DNA and gel electrophoresis analysis after irradiation. The results are surprising, because the supposedly photostable N-ethyl derivatives are more efficient DNA cleavers in long-term irradiation than the reactive N-methoxy onium salts, which are more efficient at short irradiation times. This project allows undergraduate students an interdisciplinary research experience as they can work on synthesis, photochemistry, photophysics, DNA binding and DNA cleaving sub-projects and see the direct impact of their results on the overall outcome.

4:45 CLOSING REMARKS

THURSDAY EVENING

POSTER SESSION

P3.01
THEORETICAL CALCULATION OF THE N-H STRETCH IN AMMONIA

Micah Davis, Ver Geshia Johnson, Joseph Bentley
Delta State University

The potential energy curve for the N-H stretch in the ammonia (NH3) molecule is modeled by fitting a data set generated by GAUSSIAN. The GAUSSIAN calculation was a restricted Hartree-Fock calculation with a 6-31G(d) basis set. The fitted potential energy curve was compared with the output from GAUSSIAN. Subsequently, the stretching vibrational wavenumbers were calculated using a one-dimensional model with a set of DVR points as a basis set. Additionally, progress is reported on developing a two-dimensional ammonia potential energy surface.

P3.02
PREDICTING CYTOCHROME P450 SITES OF METABOLISM THROUGH 3D MOLECULAR MODELING

Tamera Hughes[1], Pahk Thepchatri[2], Serdar Kurtkaya[2], Edjohnier Phillips[1], Jim Snyder[2]
[1]Tougaloo College, [2]Emory University

Cytochrome P450 (CYP) is a superfamily of powerful detox enzymes. CYPs are capable of catalyzing the metabolism of many organic substances including lipids and steroidal hormones, as well as xenobiotic substances such as drugs and other toxic chemicals. Thus, CYP plays a significant role in the metabolism of therapeutic drugs, thus preventing these compounds from binding to their intended targets. Collectively, the various isoforms of CYP are involved in 90% of drug degradations and, therefore, have garnered significant attention in the pharmaceutical industry. Accordingly, it is important to identify CYP's essential receptor recognition elements and develop methods to predict sites of metabolism for a variety of drug-like scaffolds. This study will focus on the ability of 3D computational docking techniques to identify the metabolism site points of mercaptoimidazole-containing molecules with known experimental metabolic data. Methodology developed from this study will then be applied to other mercaptoimidazole compounds currently under investigation at the Emory Chemistry Department and the Emory Institute for Drug Discovery.

P3.03
DISTRIBUTION OF NANOPARTICLES AND METAL IONS IN ORGANS OF RATS EXPOSED TO CADMIUM SELENIDE NANOPARTICLES

Wanaki McDuffy, Mehmet Ates, Zikri Arslan, Ibrahim Farah
Jackson State University

Cadmium selenide nanoparticles are highly attractive materials for optical probing due to their novel optoelectronic properties. However, exposure to these NPs is concerning since extremely small particles coulbe easily be distributed to entire body through blood. Formation of toxic Cd ions is also an impartant health risk if NPs degrade in the body. In this study, we examined the distribution pattern of CdSe NPs and also probed into the fractions of Cd ions to answer the questions about metabolic stability. Samples collected from Sprague Dawley rats were analyzed for total Cd and free Cd by ICP-MS. Total Cd analysis showed that NPs mainly accumulate in the liver and kidney. To achieve detection of free Cd from the liver and kidney samples, a series of experiments were performed for quantitative extraction of free Cd without affecting intact NPs. Dissolution in tetramethyl ammonium hydroxide (TMAH) under mild heating proved to be

the most efficient for extracting Cd into solution from the tissues. Accuracy was verified by analysis of Dogfish Liver Certified Reference Material (DOLT-4). Recoveries for Cd were greater than 90%. Effects of TMAH on stability of CdSe NPs were investigated by treating NP suspensions in TMAH under same conditions. No significant degradation was detected from treated NPs (p

P3.04
UPTAKE AND TOXICITY PATTERNS OF ZINC OXIDE NANOPARTICLES ON *ARTEMIA SALINA* LARVAE

Mehmet Ates, James Daniels, Zikri Arslan
Jackson State University

Zinc oxide (ZnO) nanoparticles (NPs) are receiving increasing attention due to their widespread applications. However, limited information is available about their effects on biota and aquatic species. In this study, *Artemia salina* larvae were used to determine toxicity and uptake profile of ZnO NPs of different sizes (10-30 nm and 200 nm). Acute exposure was conducted on *A. salina* larvae in seawater for a period of 30 h. Larvae were exposed to three different concentrations (100, 500 and 1000 mg/L) of ZnO NPs that were prepared by sonication and suspended in the water. TEM images confirmed that ZnO NPs aggregated to some extent in water to form larger particles as large as 1.0 µm. Up to 100 mg/L, no adverse effects were observed, while both 500 and 1000 mg/L levels exhibited detectable toxicity. Mortality at 100 mg/L was not significant from controls ($p<0.05$), whereas about 20-23% mortality occurred at 500 and 1000 mg/L levels. Accumulation of NPs within the body was confirmed by phase contrast microscopy. Total ZnO (10-30 nm) NP content was determined by ICP-MS from *A. salina*, and were 1.55, 1.95 and 2.56 mg/g for 100, 500 and 1000 mg/L ZnO NPs, respectively. On the other hand, total NP content was 1.44, 8.45 and 10.1 mg/g for 100, 500 and 1000 mg/L for 200 nm ZnO NPs, respectively. Data indicated that smaller NPs were accumulated and excreted at similar rates. But larger NPs due to aggregation were difficult to excreted and thus accumulated to greater levels

P3.05
A COMPARISON OF OPTICAL ROTATION ANGLES OF ANIMAL- AND PLANT-DERIVED BIODIESELS

Charles Smithhart, David Clark
Delta State University

It has been known for some time that the optical rotation of fossil petroleum is associated with its degree of geologic maturation (Rosenfeld, *Journal of the American Oil Chemist's Society*, Vol. 44, 1967). This study compared the optical rotation angles of soybean-derived and animal-derived biodiesels from the National Institute of Standards and Technology (NIST). A statistical comparison of means and variance of optical rotation angles was made between SRMs 2772 and 2773 using data acquired from a Rudolph Research Autopol III automated polarimeter. Correlations of the experimental data with known biodiesel parameters will be discussed.

P3.06
DETERMINATION OF PLASTIC DENSITIES

Joseph Dycus, Kourtney Ayles, Louis Somlai, Alline Somlai
Delta State University

Industries across the world use polymers to create a variety of plastic products. This study attempts to examine both polymer resins and plastic products made from these resins to determine if the processing (injection molding) changes the density of the plastic, specifically resins of linear low density polyethylene, polypropylene, polyvinyl chloride, and polycarbonate. Densities of the plastics were determined using solvent displacement methods. Results from solvent displacement methods were compared to results obtained using gradient density column measurements.

P3.07
DETERMINATION OF CALORIC VALUES OF AGRICULTURAL CROPS AND CROP WASTE BY ADIABATIC BOMB CALORIMETRY

Hugh Broome[1], Subhi Younces[1], Michele Stover[1], Marcus Steele[1], Gretchen Sassenrath[2], Jason Corbitt[2]
[1]William Carey University, [2]Mid-South USDA-ARS Research Center

Calorific values of agricultural crops and their waste were measured by adiabatic bomb calorimetry. Sustainable farming techniques require that all potential sources of revenue be utilized. A wide variety of biomass is beginning to be used as alternative fuels all over the world. The energy potential of low value crops and crop residue has the capacity of making a small farm self sustaining in times of low market value. The caloric value of all

portions of the crop product was measured individually to evaluate its potential as an energy source. Rice, corn, soybeans, cotton, wheat, rye, and sweet potatoes were included in this study. All crops were grown and harvested under the care of scientists at the USDA-ARS Research Center in Stoneville, MS. The experimental procedure was based on that used by Núñez-Regueira et al. [*Thermochimica Acta* Volume 371, Issues 1-2, 26 April 2001, Pages 23-31]. Additional parameters evaluated were moisture content, density, and ash content. The experimental results, with calorific values exceeding 16 kJ g^{-1}, make it feasible to use these materials as alternative fuels.

P3.08
SYNTHESIS OF ISOXAZOLINES AND ISOXAZOLES VIA 1, 3-DIPOLAR CYCLOADDITION REACTIONS IN AQUEOUS MEDIA: A GREEN APPROACH

Lenore Holmes, Ashton Hamme
Jackson State University

The current paradigm in organic chemistry is that organic reactions are performed in organic solvents. This premise is based upon the "like dissolves like" concept meaning, in order for a reaction to occur, all of the reactants must react in a homogeneous solution. Though this basis has been successful for many years, most organic solvents are hazardous, toxic and environmentally harmful. Water is the most environmentally benign solvent that can be used as a reaction medium. However, solubility issues that arise between organic compounds and reagents with water make water an unattractive solvent for organic reactions. We investigated the incorporation of water soluble Lewis acids that promote a 1, 3-dipolar cycloaddition reaction between organic molecules in water. Specifically, we have examined the use of metal-containing Lewis acid promoters to bring about the formation of nitrile oxides from the analogous α-chlorobenzaldoximes. These nitrile oxides were then reacted with alkenes to afford isoxazoline and isoxazole compounds in good isolated yields. We will discuss how Lewis acids affect the reaction rates and yields for the 1, 3-dipolar cycloaddition reaction of our substrates in the universal solvent, water.

P3.09
A NEW MACROCYCLE FOR ANION SENSING

Marcy Pilate[1], Md. Alamgir Hossain[1], Douglas Powell[2]
[1]Jackson State University, [2]University of Oklahoma

In recent years, the field of anion binding has attracted a special interest, since anions play a fundamental role in a wide range of chemical and biological process [1,2] Currently, there are several hazardous anions in the environment, such as sulfate, chloride, and perchlorate which are associated with a number of health related problems. In order to develop selective hosts for anions, we have synthesized a new macrocycle L, from the reaction of isophthalaldehyde and N′-methyl-2, 2′-diaminodiethylamine under high dilution conditions in methanol, followed by diborane reduction. ^{1}H NMR titrations have been performed to study the binding ability of this ligand for various inorganic anions in solution. We have also been successful to isolate chloride and perchlorate complexes of the ligand, which have been analyzed by X-ray crystallography. Detailed solution and solid state binding aspects of the new ligand will be focused in this presentation. Acknowledgements: The project described was supported by Grant Number G12RR013459 from the National Center for Research Resources. This material is based upon work supported by the National Science Foundation under CHE-0821357.

References

1. Hossain, M. A. "Inclusion Complexes of Halide Anions with Macrocyclic Receptors" *Curr. Org. Chem.* 2008, *12(14)*, 1231-1256.
2. Mendy, J. S.; Pilate, M.; Horne, T.; Day, V. W.; Hossain, M. A. "Encapsulation and selective recognition of sulfate anion in an azamacrocycle in water". *Chem. Commun*. 2010, 2010, *46*, 6084-6086.

P3.10
MOLECUAR ENCAPSULATION AND RECOGNITION OF SULFATE ION IN AN AZAMACROCYCLE

John S. Mendy[1], Marcy L. Pilate[1], Toyketa Horne[1], Victor W Day[2], Md. Alamgir Hossain[1]
[1]Jackson State University, [2]University of Kansas

Because sulfate is a key anion in both environment and biology, we have been interested to explore selective receptors for binding of sulfate in both solution and solid states. During our study, we synthesized a new compound and isolated a sulfate complex encapsulated in the macrocycle. ^{1}HNMR titration studies were performed at pH 2.0 for different halides and ox anions (I^- Cl^- Br^- NO_3^- ClO_4^- SO_4^{2-}) in water and our results suggest the significant selectivity of sulfate over other anions. Details of the structural aspects and binding properties will be

presented in this poster. Acknowledgements: [The project described was supported by Grant Number G12RR013459 from the National Center for Research Resources. This material is based upon work supported by the National Science Foundation under CHE-0821357].

P3.11
SHORT AND LONG TERM IMPACT OF SILVER NANOPARTICLES ON *ARTEMIA SALINA* LARVAE

James Daniels, Mehmet Ates, Zikri Arslan
Jackson State University

Silver nanoparticles (Ag NPs) exhibit anti-bacterial activity and cleansing action. These features increased concerns about their deleterious effects on the environment and human health. In this study, *Artemia salina* larvae were used to test the impact of Ag NPs. Acute and chronic exposures were conducted on *A. salina* larvae in seawater for a period of 24h and 120h. Larvae were exposed to 10, 50 and 100 ppm concentrations of Ag NPs (20-30 nm). Nanoparticle stability, toxicity and uptake were evaluated. It was found that Ag NPs aggregated in water to form larger particles as large as 300 nm. The magnitude of aggregation increased with increasing NP concentration such that more than 50% of NPs were greater than 30 nm in water. Ag NPs were more toxic to *A. salina* in the long-term exposure. Short-term mortality rates were 14.5%, 24.5% and 30.5%, and that for long-term were 59%, 94% and 100% for 10, 50 and 100 ppm Ag NPs. Accumulation of NPs within the body was confirmed by phase contrast microscopy that showed visible deformation at 100 ppm level. Total Ag content ranged from 0.60, 1.3 and 1.54 mg/g (10, 50 and 100 ppm) for short-tem exposure and 5.38 and 10.3 mg/g (10 and 50 ppm Ag NP). No measurement was done for 100 ppm level since A. *salina* culture died. These results showed that Ag NPs are highly toxic to A. *salina* larvae both under short- and long-term exposure. At higher levels lethal effects become more pronounced.

P3.12
DEFINING THE ROLE OF OXALATE METABOLISM IN ESCHERICHIA COLI

Lauren Gabreski, Jonathan Ebelhar, Cory Toyota
Millsaps College

The *Escherichia coli* enzymes YfdW and YfdU are an oxalate:formyl-CoA transferase and an oxalyl-CoA decarboxylase, respectively. Coupled, these enzmes catalyze the decarboxylation of oxalate to yield formate. Together with the *yhjX* gene product, a putative oxalate:formate antiporter, these three proteins are theoretically sufficient to provide *E. coli* with an oxalate-dependent acid resistance system similar to the well-known AR2 and AR3 glutamate- and arginine-dependent acid resistance systems and/or the ability to metabolize oxalate as a carbon and energy source. Reports have shown that knockdown of YfdW/U results in reduced acid resistance in *E. coli* and *yhjX* has also been linked to acid response.
Pathogenic bacteria like enterohemorrhagic *E. coli* O157:H7 must survive passage through the harsh acid environment of the stomach and so further understanding acid resistance in *E. coli* has clear health implications. Humans have no innate mechanism for metabolizing oxalate, thus, oxalate-degrading enzymes and microbes are of interest as a possible form of therapy for calcium oxalate stones, the most prevalent form of kidney stone in man. *E. coli* has never been shown to metabolize oxalate, but if it can be induced to degrade oxalate in the gut, this may offer a possible therapeutic treatment for kidney stones. We investigated the roles that YfdW, YfdU, and YhjX play in *E. coli*. Specifically, mRNA expression levels were assessed in response to oxalate exposure and survival after acid-shock is monitored to test if *E. coli* is capable of using oxalate as a metabolite in a new acid resistance mechanism.

P3.13
DECARBOXYLATIVE PHOTOCYCLIZATION OF CATIONIC ω-CARBOXYLIC ACIDS

Philip Schwartz, Eli Smith, David Sandlin, Wolfgang Kramer
Millsaps College

The decarboxylative photocyclization has been used to synthesize hetercyclic ring systems allowing several functional groups and ring sizes up to 36 members. The synthetic potential of the reaction is diminished by the incorporation of the phthalimide nitrogen into the product. To expand the versatility of the decarboxylative photocyclization we are using cationic precursors as well as different chromophors. Cationic precursors are not expected to interfere with the cyclization reaction which involves electron transfer from the donor to the exited acceptor. The use of different chromophors will

allow the synthesis of multiple target molecules while the cationic chracter might enable us to use chiral auxiliaries. It has been shown that electron transfer fluorescence quenching does take place in quinoline betaines compounds. The synthesis of the precursors as well as the photochemical transformations are discussed.

P3.14
SYNTHESIS AND PHOTOCHEMISTRY OF A LIBRARY OF BIFUNCTIONAL DNA-CLEAVING REAGENTS

Brooke Lassiter, GeNita Finley, Woods Curry, Wolfgang Kramer
Millsaps College

Nitrogen onium salts based on aromatic heterocycles have a potential as photodynamic therapy drugs. The light-induced homolytical nitrogen-oxygen bond cleavage yields a radical cation of the aromatic heterocycle and an alkoxy radical. Both of these transient species are highly reactive and can induce oxidation reactions (radical cation) and radical reactions (alkoxy radical). Both of the species are produced with a quantum yield of about 0.6. Energy wasting steps appear to be the geminate pair recombination to form several isomers of the methoxy substituted aromatic heterocycle. To expand the library of 1,8-naphthalmide linked onium salts we attempt to modify the spacer length as well as the attached aromatic heterocycle. Several synthesis attempts have been made to extend the methylen spacer length. Mitsunobu transformation of alcohols into the phthalimides was interfered by the nucleophilic pyridine nitrogen. Variation of the heterocycle can be accoplished by Friedlaender quinoline synthesis. The precursors were synthesized by Swern oxidation and aniline reduction. After the synthesis, oxidation yielded the heteroaromatic N-oxide which was alkylated by trimethyloxonium tetrafluoroborate to give the photoreactive N-methoxy salt. The isoelectronic, photostable N-ethyl derivative was obtained by direct alkylation of the parent heterocycle. The synthesis and photochemistry of the novel compounds are investigated and discussed.

P3.15
BIFUNCTIONAL DNA-CLEAVING REAGENTS: DNA GROUND STATE ASSOCIATION AND CLEAVAGE

Adi Sabharwal, Lee Wink, Austin Baker, Emily Stewart, Wolfgang Kramer
Millsaps College

The light-induced homolytic nitrogen-oxygen bond cleavage of N-methoxy nitrogen onium salts produces two transient species, each of which has been shown to damage DNA. Each species is reacting with a different mechanism. While the formed radical cation targets the DNA bases, the methoxy radical damages the DNA backbone via hydrogen abstraction. The efficiency of this reaction has been analyzed by the determination of the quantum yield of ion formation. Each transient species if produced with a yield of about 0.6, the energy wasting step being geminate pair recombination to yield methoxy-substituted heterocycles. To effectively cleave DNA, a high ground-state association is desired. DNA binding is determined by UV/VIS, fluorescence and CD spectroscopy titrations. Interestingly, the changes in the CD spectrum can give information about the binding mode. The influence of the spacer length and the heterocycle is evaluated and the synthesis of bifunctional onium salts is optimized with those results. In addition, we are discussing several DNA binding models, based on the McGhee/von Hippel model. In vitro DNA cleaving efficiency is determined compared to a known photochemical DNA cleaver by gel electrophoresis with ethidium bromide staining.

P3.16
SIZE DEPENDENT LINEAR AND NON LINEAR OPTICAL PROPERTIES OF NANO MATERIAL

Sadia A. Khan, Anant K. Singh, Paresh C. Ray
Jackson State University

Present interest on size dependent linear and non-linear optical properties of nano material is due to the collective oscillation of the electron in the conduction band which is known as surface Plasmon. When this oscillation matches the incoming electromagnetic radiation there is a huge enhancement of excitation called surface Plasmon resonance. The synthesis of size controlled nano material can be promising for future photonic and optoelectronic devices. The non-linear optical properties of nano material is measured using hyper - Rayleigh scattering technique. We have shown that both linear and non-linear optical properties of silver triangle nanoprism is highly size dependent. So by controlling the size of nano structure we can improve the NLO properties of nano material. We have also provided experimental evidence for the sensitivity

and selectivity of the NLO Assay in detecting the biological and chemical species.

P3.17
SELECTIVE AMINE HOSTS FOR ANION

Whitney Quinn, Musabbir Saeed, Alamgir Hossain
Jackson State University

Synthesis of amine based host has become an important aim in inorganic chemistry due to its ability to retract health threatening anions. Tren based amine hosts or macrocyclic receptors are able to recognize anions and characterize them by selectively binding to various anions[1]. An anthracene-based amine host was synthesized from the condensation of Tren and with anthra-aldehyde, followed by a sodium borohydride reduction. The compound was characterized and binding studies were performed by ^{1}H NMR titrations in chloroform. The neutral ligand was protonated from the reaction with *p*-toluenesulfonic acid giving a triply charged chemosensor that was examined for its anion binding ability toward fluoride, chloride, bromide, sulfate and nitrate by the fluorescence spectroscopy in DMSO. Meanwhile, the complexes of sulfate and perchlorate with Tren were isolated and their structures were determined by X-ray crystal structure analysis. The addition of an anion to the ligand resulted in an enhancement in fluorescence intensity at the excitation of 310 nm. Analysis of the spectral changes suggested that the ligand formed a 1:1 complex with strong affinity for fluoride and sulfate in DMSO. The unsubstituted tren was reacted with sulfuric acid forming a sulfate complex, determined by X-ray crystallography. Analysis of the complex revealed that three sulfates are held between two ligands by hydrogen bonding interactions with protonated amines. These same synthetic processes were performed to synthesize an amine-based macrocycle with similar biological purposes.

Reference:

[1] Hossain, M.A "Inclusion Complexes of Halide Anions with Macrocyclic Receptors" *Curr. Org. Chem*. 2008, *12(14)*, 1231-1256.

P3.18
BINDING AND SELECTIVITY ASPECTS OF AN EXPANDED AZAMACROCYCLE FOR ANIONS

Toyketa Horne, Kalpana Dey, Alamgir Hossain
Jackson State University

An expanded azamacrocycle L, containing four secondary and two tertiary amines was synthesized, and its binding ability towards chloride, bromide, iodide, sulfate, nitrate and perchlorate anions were determined by ^{1}H NMR titrations in D_2O at pH 1.7. The results suggest that the ligand is capable of forming a complex with each of the anions examined, showing a selectivity for sulfate in water. Crystal growth formed in perchlorate and iodide complexes. X-ray diffraction analysis of the perchlorate complex of L suggests that the ligand is tetraprotonated and is involved in interacting anions from both sides forming a ditopic complex with strong NH···O bonds. In the packing diagram, the macracycles and external perchlorates are alternatively linked through hydrogen bonding to form an ID chain.

[Acknowledgements. The project described was supported by Grant Number G12RR013459 from the National Center for Research Resources. This material is based upon work supported by the National Science Foundation under CHE-0821357]

P3.19
EXTRACTION METHODS AND TRANSESTERIFICATION TECHNIQUES ON OIL FROM USED COFFEE GROUNDS FOR USE AS BIOFUEL FEEDSTOCK

Michael McNatt, Kimberly Simmons
William Carey University

Coffee is the second most traded commodity in the world, just behind petroleum. Research estimates show that if the oil from waste coffee grounds from the Starbucks in the U.S. were converted to biodiesel it could amount to 2.9 million gallons of biodiesel a year. If waste coffee grounds from the world's coffee production were used, ~208 million gallons of biodiesel could be produced annually. Biodiesel is often not as economical as petroleum diesel largely due to the production cost of the biofuel crop itself. A low valued biofuel feedstock such as used coffee grounds cuts production costs to be comparable to petroleum diesel. Biodiesels are commonly manufactured by the transesterification of renewable oils, fats and fatty acids. In this work we compare acetone extraction of the oil from used coffee grounds to the standard use of hexane for extraction. We investigate the energy content and makeup of the oil itself and then convert it to biodiesel via transesterifaction with methanol. This last is done comparatively between acid catalyzed and base catalyzed methods, including the

novel use of the ion-exchange resin *p*-toluenesulfonic acid. Typically NaOH or sodium methoxide are the catalysts of choice. Characterization of the oil and its fatty acid ester biofuel product include bomb calorimetry, NMR, IR and UV-vis spectroscopy. Preliminary results show that the efficiency and cost of the oil extraction is better with acetone.

P3.20
MODIFIED CELLULOSE ESTERS

Joel Epler, Robert Lochhead, Samy Madbouly
University of Southern Mississippi

The objective of this project was to cast clear films of cellulose esters from aqueous solutions. The cellulose esters that are currently available have a degree of acetate substitution of 2.5 to 3. These products are soluble in ethanol but they precipitate when 20 weight percent of water is added. Initial attempts to solubilize the polymers using acylglutamate and lecithin surfactants were only partially successful and the film quality deteriorated. A solubility diagram was constructed to identify the range of suitable solvents. Therefore, we have hydrolyzed the polymers to varying degrees of substitution, which we have determined by NMR. Films were cast and their properties measured by rocker hardness test, differential scanning calorimetry, thermogravimetric analysis, dynamic mechanical analysis. The interaction of these polymers with carboxylate and sulfate surfactants were measured by constructing plots of surface tension versus surfactant concentration

P3.21
THE DEVELOPMENT OF HIGH THROUGHPUT METHODS FOR THE STUDY OF POLYMER/SURFACTANT INTERACTION; THE EFFECT OF SALT ON THE POLYQUATERNIUM-10/SLES/WATER SYSTEM

Lauren LaBeaud, Kathleen Davis, Lisa Gandolfi, Robert Lochhead
University of Southern Mississippi

Deposition from anionic surfactant systems is frequently achieved by the formation of complex coacervates of cationic polymers and anionic surfactants. Since these coacervates are formed by ionic association, it is expected that the presence of salts would shield the interaction. On the other hand, higher Hofmeister series salts would be expected to be water-structuring and to enhance the association of the hydrophobic moieties of the surfactants. The question posed in this research was "which of these two opposing effects would dominate the overall behavior of the compositions?"
Phase diagrams were constructed for the ternary system of cationic cellulose, sodium lauryl ether sulfate and water. The order of addition produced large changes in the phase behavior of the compositions. These changes could be rationalized by considering the effect of salt on either the micelles or the polymer and on which component was initially exposed to salt by each the order of addition.

P3.22
THE DEVELOPMENT OF HIGH THROUGHPUT METHODS FOR STUDY OF POLYMER/SURFACTANT INTERACTION

Kathleen Davis, Lauren LaBeaud, Lisa Gandolfi, Robert Lochhead
University of Southern Mississippi

Formulators of complex mixtures have long known that the characteristics of their final formulation and the position of “equilibrium” often depends critically upon the order of addition of ingredients and the precise processing conditions under which the formulation was made. Modern formulations require a precision in ingredient selection and processing conditions and the number of possible choices is astronomical. Conventional formulation is severely limited by the number of compositions that can be investigated in a reasonable time. Therefore, it behooves us to seek methods that quickly allow the formulator to scan the compositional and processing landscape for optimum formulations. Phase diagrams were constructed for the ternary system of cationic cellulose, sodium lauryl ether sulfate and water. The order of addition produced large changes in the phase behavior of the compositions. These changes could be explained on the basis of micelle structure and polymer conformation at the time of mixing.

Friday, February 18. 2011
Room 218B

O3.10
9:00 PROFILING UPTAKE AND TOXICITY OF TITANIUM OXIDE NANOPARTICLES ON BRINE SHRIMP

Zikri Arslan, Mehmet Ates
Jackson State University

Titanium oxide (TiO_2) nanoparticles (NPs) are by far the most common nanomaterials used in consumer products that are mainly released to water resources. In this study, *Artemia salina* larvae were used to test toxicity and uptake of TiO2 NPs (10-30 nm). Acute exposure was conducted on *A. salina* larvae in seawater for a period of 30 h in the absence of food. Larvae were exposed to three different concentrations (100, 500 and 1000 mg/L) of TiO2 NPs that were prepared by sonication for 3 min and suspended in the water. Nanoparticle stability, toxicity and uptake were evaluated. It was found that TiO2 NPs aggregated substantially in water to form larger particles as large as 2 μm. The magnitude of aggregation increased with increasing NP concentration such that more than 50% of the particles were greater than 200 nm (0.2 μm) in water. Suspensions were, however, not toxic to *A. salina*, even at 1000 mg/L level for which visibility was almost completely lost. Mortality ranged from 8 to 14% which was found to be insignificant ($p<0.05$). Total TiO2 NP content ranged from 2.15 ± 0.20 to 7.78 ± 1.10 mg/g for 100 and 1000 mg/L TiO2 NP, respectively. Uptake remained relatively constant (e.g., saturation) above 500 mg/L. This result suggested that *A. salina* larvae were unable to excrete all TiO2 NPs accumulated. Though no adverse effects were found from acute exposure, the levels taken up by *A. salina* suggest that substantial amounts NPs may be transported in marine food chain.

O3.11
9:20 EXPLORATION IN OXOMETALLIC FULLERENES

Mary Mackey, Steven Stevenson
University of Southern Mississippi

Research groups around the world have taken an interest in the synthesis, purification, characterization, and functionalization of the newly discovered Oxometallic Fullerenes (OMFs). These molecules, which consist of a carbon cage containing a metal oxide cluster, are the focus of our current research. In this presentation, we have developed a novel approach for the separation of Metallic Nitride Fullerenes and the enrichment of Oxometallic fullerenes via selective precipitation of fullerenes. We discuss the effect of concentration, reaction time, and precipitating agent in this technique. We will also touch on the role of the solvent in this reaction, as we have discovered that performing these experiments in certain solvents results in adduct formation.

O3.12
9:40
ELECTROCHEMICAL AND SPECTROSCOPI C STUDIES OF BI- AND TETRA-NUCLEAR RUTHENIUM(II) CONTAINING COMPLEXES

LaCrissia Bridges, Suman Parajuli, Nerissa Lewis, Alvin Holder, Wujian Miao
University of Southern Mississippi

Bi- and tetra-nuclear ruthenium(II) containing complexes were synthesized and characterized by elemental analysis, ESI-MS, IR, UV-visible, fluorescence, and ^{1}H and ^{13}C NMR spectroscopy. Electrochemical studies of the complexes were carried out in organic solvents at various electrodes, and the electrogenerated chemiluminescent (ECL) investigations were realized with a coreactant ECL approach in which both tri-*n*-propylamine (TPrA) and 2-(dibutylamino)ethanol (DBAE) were used as the ECL coreactant. Comparisons of the ECL efficiencies obtained from the complexes using TPrA and DBAE coreactants and their ECL and fluorescent spectra will be presented with proposed mechanisms.

O3.13
10:00 SYNTHESIS OF SPIRO-ISOXAZOLINES VIA INTRAMOLECULAR CYCLIZATION

Ashton Hamme, Prasanta Das, Ann Omollo, Lungile Sitole
Jackson State University

Psammaplysins A-E are a family of natural products that were isolated from marine sponges of the order Verongida. Many of these natural products display antiviral and antineoplastic activities. The most interesting structural motifs of the psammaplysins are the oxipin and isoxazoline ring systems which are connected in a spirocyclic array. The synthesis of this type of ring system was

accomplished in two steps. These synthetic processes involve a 1,3-dipolar cycloaddition and an intramolecular ring closure of a pendant alkoxide or carboxylate ion onto an activated isoxazole. The 1,3-dipolar cycloaddition of an alkyne with a nitrile oxide from the analogous alpha-chlorobenzaldoxime afforded the desired isoxazole. Intramolecular cyclization was achieved through the reaction of the isoxazole ring with pyridinium tribromide. The proposed mechanism of intramolecular cyclization involves the activation of the isoxazoline ring with bromine to form a bromonium ion. Neighboring group participation of the oxygen can cause an opening of the bromonium ion intermediate thereby giving rise to an oxonium ion. Intramolecular attack of the alkoxide or carboxylate ion onto the oxonium ring system then affords the spiro-isoxoline. The synthesis, mechanistic details, and isolated yields for the synthesis of our spiro-isoxoline compounds will be discussed. Acknowledgments: We thank the National Institutes of Health RCMI program (G12RR13459 (NMR and Analytical CORE facilities)), the NSF-RISE program (HRD-0734645).

10:20 BREAK

O3.14
10:30 REDUCTION OF SODIUM CONTENT IN MEATS BY SOAKING IN WATER

Lakeshia Allen
Mississippi Valley State University

The purpose of this experiment is to study of how much sodium can be removed from processed meats by soaking. Sodium is an essential nutrient for bodily functioning and for flavor modification, needed in very little amounts of less than 2400mg daily within a 2000 calorie diet. Most people consume much more than is required which leads to health problems, hypertension in particular. Processed meats become enriched in sodium as a result of processing. In this study we investigate the feasibility of reducing the sodium content of processed meats by soaking in water. We used an atomic spectrometer called the Flame Atomic Absorption and a conductivity meter to determine the amount of sodium removed from the meat sample by soaking. By comparison of both data points, we developed an estimate of the percent removal of sodium from the processed meat by soaking. Doing this study we found that the meat is at approximately 800mg/L (ppm). Data charts are used to show the relation of standard samples and meat samples. Meat samples result in the curve between 100ppm standard and 1000ppm standard. This is shown with correlation of absorption and conductivity. In conclusion, soaking does have a significant effect on sodium content of meat. Based on our study, we found that approximately fifty-three percent of the sodium content may be extracted from bologna after soaking forty-eight hours. Sodium was significantly reduced showing a result of 800ppm in sodium extraction. Soaking meats does have a direct affect.

O3.15
10:50 A NOVEL CHEMOSENSOR FOR SELECTIVE DETECTION OF PHOSPHATE IN WATER

Musabbir A. Saeed[1], Douglas R. Powell[2], Md. Alamgir Hossain[1]
[1]Department of Chemistry and Biochemistry, Jackson State University, [2]Department of Chemistry and Biochemistry, University of Oklahoma

Selective and sensitive sensing of anion is a current challenge in the area of supramolecular chemistry. Sensing of biologically relevant anions is an important step to understand the detailed mechanisms of our living system. Because of the interesting geometry and the orientation of metal ions in a macrocyclic ligand, a dinuclear metal complex is potential to bind an anion. Anion sensing of a receptor could be enhanced using fluorescence indicator displacement assay, and this technique is often useful to show the selectivity of a particular anion[1]. During the course of our study, we synthesized a new macrocyclic dinuclear copper complex which showed strong sensitivity and selectivity towards phosphate over sulfate, nitrate, perchlorate and halides in water at physiological pH. This poster will focus the structural and selectivity aspects of this new macrocyclic chemosensors for anions. Acknowledgements: The project described was supported by Grant Number G12RR013459 from the National Center for Research Resources. This material is based upon work supported by the National Science Foundation under CHE-0821357.
(1) Saeed, M. A.; Powell, D. R.; Hossain, M. A. *Tetrahedron Letters* **2010**, *51*, 4904-4907.

O3.16
11:10 A NEW TRIPODAL *TRIS*-UREA RECEPTOR FOR HALIDE BINDING

Avijit Pramanik[1], Douglas R. Powell[2], Md. Alamgir Hossain[1]
[1]Jackson State University,[2] University of Oklahoma

An interest in anion binding chemistry is growing rapidly due to the important roles that

negatively charged species play in biological processes [1.2]. Anions are also significant in chemical, medicine, catalysis, and environmental science. In particular, urea based ligands have shown to demonstrate as effective receptors for a variety of anionic species [3]. This class of receptors is capable to bind anions through hydrogen bonding integrations (NH...anion) in aprotoic solvent which can be useful for application oriented field. We recently synthesized a new receptor based on tripodal *tris*-urea with *p*-cyano groups, which have six ureido -NHs. Our crystallographic analysis suggests that the ligand is capable to bind both chloride and bromide with four hydrogen bonds. In this poster, we will present detailed solution and solid state binding of halides.

References:
1. J. L. Sessler, P. A. Gale, W.-S. Cho, Anion Receptor Chemistry, Royal Society of Chemistry, Cambridge, 2006.
2. Mangani, M. Ferraroni, in: A. Bianchi, K. Bowman-James, E. Garcia-Espana (Eds.), Supramolecular Chemistry of Anions, Wiley-VCH, New York, 1997.
3. R. Custelcean, B. A. Moyer and B. P. Hay, *Chem. Commun*. 2005, 5971-5973.

O3.17
11:30 DECARBOXYLATIVE PHOTOCYCLIZATION OF CATIONIC PHTHALIMIDE AND QUINOLINE/ISOQUINOLINE ω-CARBOXYLIC ACIDS

Eli Smith, David Sandlin, Philip Schwartz, Wolfgang Kramer
Millsaps College

The decarboxylative photocyclization is an elegant photochemical way to synthesize small to medium sized heterocycles. The product is a pyrrolizidine annelated structure. Several functional groups are tolerated and ring sizes up to 36 members have been isolated with appropriate precursors. The synthetic potential of the reaction is diminished by the incorporation of the phthalimide nitrogen into the product. To expand the versatility of the decarboxylative photocyclization we are cationic precursors as well as different chromophors. Cationic precursors will enable us to use chiral biomolecules, such as DNA, as chiral auxiliaries as well as explore potential interactions in the course of the reaction. In one example, the phthalimide chromophor is attached to a nonconjugated pyridinium moiety which carries the positive charge. The use of different chromophors will greatly increase the synthetic potential of the cyclization reaction. The simple chromophors quinoline, isoquinoline or phenanthridine will give access to new classes of compounds. It has been shown that electron transfer fluorescence quenching does take place in quinoline betaines compounds. The synthesis of the precursors as well as the photochemical transformations are discussed.

11:50 ELECTION OF NEW CHAIR AND VICE-CHAIR

12:00 CLOSING REMARKS

ECOLOGY AND EVOLUTIONARY BIOLOGY

Chair: Dr. Paul Mack,
Mississippi University for Women
Vice-Chair: Brent Hendrixson,
Millsaps College

THURSDAY MORNING
Room 227

O4.01
9:00 INVESTIGATING MECHANISMS OF CO-OCCURRENCE BETWEEN TWO SIMILAR SPECIES OF PREDACIOUS DIVING BEETLES (*COLEOPTERA: DYTISCIDAE*)

Kristopher Pitcher, Donald Yee
University of Southern Mississippi, Mississippi, United States

In order to predict patterns of species co-occurrence and exclusion, both within and among habitats, it is important to understand the mechanisms that drive these patterns. The family Dytiscidae is a model group for testing co-occurrence and exclusion mechanisms since numerous species of the family interact in isolated, aquatic habitats and are ubiquitous throughout landscapes. We chose to focus on two morphologically similar species, *Laccophilus faciatus rufus* and *Laccophilus proximus*, which co-occur in a number of habitats in southern Mississippi and are hypothesized to have strong interspecific interactions. We investigated several possible mechanisms including segregation in habitat domain, differences in behavior, and differences in dispersal response that would allow the pattern of co-occurrence between the two species of beetle.

Behavioral assays showed no significant difference in habitat domains or behaviors between the two species when either alone or when experiencing intra- or interspecific densities. Mass change due to prey consumption was also not affected by density or competition. A field experiment looking at the dispersal response of both species at different intra- and interspecific densities showed that *L. proximus* exhibited a higher dispersal rate regardless of the treatment. Our study suggests that segregation of habitat domain and behavioral differences are likely not adequate mechanisms driving with-in habitat co-occurrence in these two morphologically similar species. However, variation in dispersal may be allowing temporary co-occurrence of *L. faciatus rufus* and *L. proximus* among habitats. We suggest other mechanism that may better explain within habitat co-occurrence and how they could be tested.

O4.02
9:15 A MULTIFACETED TAXONOMIC ASSESSMENT OF THE TARANTULA *APHONOPELMA ANAX* (ARANEAE: THERAPHOSIDAE) AND ITS CLOSE RELATIVES FROM SOUTH TEXAS

Majel Purvis, Brent Hendrixson
Millsaps College, Jackson, MS, United States

The tarantula genus *Aphonopelma* comprises at least 90 species throughout the United States, Mexico, and portions of Central America. Despite this putative diversity, however, very few non-type specimens can be confidently identified using available taxonomic keys or species descriptions; consequently, species boundaries in this interesting group of spiders remain obscure and problematic. Of particular interest is the species *A. anax* and its close relatives *A. harlingenum* and *A. breenei* from South Texas. These spiders have been described on the basis of only a few individuals, resulting in poorly defined limits of intraspecific and interspecific variation. In order to assess species boundaries in this group, we employed a multifaceted taxonomic approach utilizing genetic and geospatial data. Our results demonstrate that these three nominal species are genetically and ecologically "cohesive" and should no longer be recognized as three distinct species; instead, our data support the synonymy of *A. harlingenum* and *A. breenei* under the name *A. anax*. Our results further show that *A. anax*-like specimens from some western localities belong to a genetically divergent lineage; however, geospatial analyses do not demonstrate concomitant ecological divergence between western and eastern populations. As such, we argue that *A. anax* is the only "large brown" tarantula species in South Texas, but it possesses substantial genetic diversity that appears roughly structured along the boundary between the following Level III Ecoregions: the Southern Texas Plains and the Western Gulf Coastal Plain.

O4.03
9:30 THE EFFECTS OF SALT TOLERANCE ON INTERSPECIFIC COMPETITION BETWEEN *AEDES ALBOPICTUS* AND *AEDES AEGYPTI*

Elizabeth Himel, Donald Yee
University of Southern Mississippi, Hattiesburg, MS, United States

Interactions between competing species tend to be context dependent. Studies dealing with competition between the larvae of two invasive species of mosquito, *Aedes albopictus* and *Aedes aegypti* (Diptera: Culicidae), have shown that *Aedes albopicus* is the better competitor under most environments. However, *Aedes aegypti* has been shown to have higher survivorship in elevated concentrations of salt water. In this study, we determined the outcome of competition between these two species under different salt concentrations by testing survivorship, development time, and adult mass. In the laboratory, we reared varying intra- and interspecific densities of the two species in six different concentrations of salt (0-2.5%). Our hypothesis was that salt will have an effect on competition between the two species. Based on prior studies, we predicted that high concentrations of salt would negate the competitive superiority of *Aedes albopictus* over *Aedes aegypti*, whereas *Aedes albopictus* will continue to dominate under low salt concentrations. The findings of this study will give further insight into understanding the competitive dynamics between these two invasive mosquito species.

O4.04
9:45 VARIATION IN STABLE ISOTOPIC RATIOS ACROSS DETRITUS TYPES FOR THREE CO-OCCURING CONTAINER MOSQUITOES

Donald Yee, Francis Ezeakacha
University of Southern Mississippi, Hattiesburg, MS, United States

Container systems (e.g., tree holes, discarded vehicle tires) are used by a host of medically important mosquito species as breeding sites. Allochthonous inputs of animal and plant detritus are the main energy source for these aquatic

container systems. In the southern United States, these containers are dominated by several species, including the Asian tiger mosquito (*Aedes albopictus*), the Yellow fever mosquito (*Aedes aegypti*), and the southern house mosquito (*Culex quinquefasciatus*). Larvae of these species vary in their competitive ability and performance both among container types and on different detritus types. We examined the performance of larvae (survival, mass and development time for males and females) of these three species grown in four ratios of animal and leaf detritus (0.20:0.00, 0.10:0.10, 0.20:1.00, 0.00:1.00 g animal:leaf detritus). We further examined the resultant isotopic signatures of adult mosquitoes to allow us to quantify differences among species in nutrient harvesting and assimilation. Results for survival suggest that all species performed well in ratios with some animal detritus, although C. *quinquefasciatus* did better in animal only containers compared to other species. In leaf only containers, survival of *C. quinquefasciatus* was lower than other species. Other findings will allow us to further examine how mosquito performance can be influenced by detritus type, and give detailed insights into the superior competitive ability of *A. albopictus* compared to other mosquito species.

O4.05
10:00 INFLUENCE OF DETRITUS LEVELS AND ORGANIC COMPOUNDS ON INTERSPECIFIC RESOURCE COMPETITION BETWEEN TWO TIRE-INHABITING MOSQUITO (DIPTERA: CULICIDAE) SPECIES

David Allgood, Donald Yee
University of Southern Mississippi, Hattiesburg, MS, United States

The Asian tiger mosquito (*Aedes albopictus*), a recent invader in North America, and the southern house mosquito (*Culex quinquefasciatus*) are the two most abundant larval mosquito species inhabiting water-filled tries in Hattiesburg, MS. Although *Ae. albopictus* is known to be a superior resource competitor to several established species, the nature of interactions between larval *Ae. albopictus* and *Cx. quinquefasciatus* have not been studied. Experiments are currently underway to 1) determine the nature of competitive interactions between *Ae. albopictus* and *Cx. quinquefasciatus*, and 2) determine the effects of chemicals associated with organic pollutants on competitive interactions between these two species. For the first experiment, microcosms were established containing three levels of organic detritus (*Quercus virginiana* leaves and *Drosophila melanogaster* carcasses) and eight ratios of *Ae. albopictus*:*Culex quinquefasciatus* larvae. For the second experiment, microcosms were established containing a constant amount of detritus, three levels of a ten-chemical blend representing organic pollution, and eight larval ratios. Microcosms were placed in an incubator at 27 °C for 45 days. For both experiments, multivariate analysis of variance (MANOVA) will be used to test for effects of treatment (i.e., detritus amount or pollution concentration), larval density ratio, and a treatment x density ratio interaction on survivorship, days to pupation, and adult dry mass for both mosquito species. These results will be used to determine the effects of resource competition and organic pollution on each species.

10:15 BREAK

O4.06
10:30 PHYLOGEOGRAPHY AND DIVERSIFICATION OF THE *VAEJOVIS VORHIESI* SPECIES COMPLEX (ARACHNIDA: SCORPIONES) FROM THE "SKY ISLANDS" OF SOUTHERN ARIZONA AND NEW MEXICO

Teal Brechtel, Brent Hendrixson
Millsaps College, Jackson, MS, United States

Climate change during the Pleistocene (10-20 ka) played a key role in shaping contemporary distributions of flora and fauna in North America. The Madrean pine-oak woodlands, presently fragmented and restricted to higher elevations in southern Arizona and New Mexico, are relics of similar habitat that was once more widespread and continuous throughout lower elevations during the Pleistocene. These "sky islands" (i.e., "islands" of forested habitat surrounded by "seas" of inhospitable desert and desert grassland habitat) harbor many populations of plants and animals that were physically separated as climate (and consequently vegetation) changed. In this study, we examine spatial patterns of genetic variation in the *Vaejovis vorhiesi* species complex, a closely-related assemblage of scorpions endemic to these "sky islands". We sampled scorpions from six mountain ranges (Chiricahuas, Huachucas, Peloncillos, Pinalenos, Santa Catalinas, Santa Ritas) with the intent that our phylogeographic approach will be used to (1) test for monophyly of individual mountain ranges (and as a result, provide an independent assessment of species boundaries within the group);

(2) determine the temporal sequence of splitting between "sky islands" (which will provide additional insight on the region's geological and ecological history); and (3) examine the relationship between genetic variation and recent habitat fragmentation (which may offer useful information for understanding the role of present-day climate change and its conservation impact on narrowly endemic species).

O4.07
10:45 EXPRESSION OF THE TRANSPORTER PROTEIN, CG4991, IN THE REPRODUCTIVE TRACT OF FEMALE ***DROSOPHILA MELANOGASTER***

George Stoner[1], Yael Heifetz[2], Paul Mack[1]
[1]Mississippi University for Women, Columbus, MS, United States, [2]Hebrew University of Jerusalem, Rehovot, Israel

Males compete for access to females for reproduction which drives the evolution of male-male competition before and after mating. In the latter case - sperm competition - overlapping ejaculates of separate males vie for the opportunity to fertilize a female's eggs. This complicated interaction can drive males to evolve ways to manipulate females via the inclusion of components in the ejaculate in addition to sperm. In the fruit fly, Drosophila melanogaster, sperm and sperm-related proteins have various affects on females including both increased ovulation and increased mortality rates. A growing number of researchers are addressing female responses to these proteins and one result of these efforts has been the identification of over 500 candidate mating responsive genes for female D. melanogaster. Recently, we have focused on the subset of these candidates which are transporter genes. More specifically, these are genes which may be involved in the transport of sperm-associated proteins or their metabolites into the epithelium of the female reproductive tract. In this study, we focus on a single gene from this highly specific subset, CG4991. We specifically examined CG4991 expression in both un-mated and mated females of varying ages at 6hrs and 7days post-mating in the seminal receptacle (SR), spermathecae (SP), uterus (UT), and rectal papillae (RP), using Our data suggest that CG4991 expression in the sperm-storing SP and sperm-handling SR is down-regulated at 6 hours post-mating. We observed the opposite overall pattern in CG4991 for the UT; expression was initially up-regulated there before returning to pre-mating levels.

O4.08
11:00 UNDERSTANDING THE DISTRIBUTION OF ***PLETHODON WEBSTERI*** **HIGHTON IN MISSISSIPPI**

Marie Thomas[1], Tom Mann[2], Debora Mann[1]
[1]Millsaps College, Jackson, MS, United States, [2]Mississippi Museum of Natural Science, Jackson, MS, United States

Plethodon websteri Highton is a rare salamander found in a highly disjunct distribution across five states (SC, GA, AL, MS and LA). It is found in forested habitats, generally in association with rock outcrops. Field surveys were performed in the attempt to obtain a more complete understanding of the geographic distribution of *P. websteri* in Mississippi and to provide an explanation for this distribution in terms of local geology and past human interference. Prior to 1990, *P. websteri* was reported from 6 sites in Mississippi. From 1990-1992 and from 2008 to the present we undertook presence/absence surveys by turning surface litter in the winter and early spring at approximately 100 sites where surface rock occurred in combination with hardwood cover. Populations were found at 9 additional sites in association with sandstone, limestone, siltstone, or gravel. Although surface rock appears to be necessary for this species, we failed to find this species at most sites with rock outcrops and favorable cover. Distribution seems to be predominantly a factor of where *P. websteri* has managed to survive in isolated pockets with favorable geologic conditions and where unfavorable land use and small population sizes have not yet caused localized extinctions.

THURSDAY AFTERNOON
Room 227

O4.09
1:00 ***MAGNOLIA GRANDIFLORA*****: DOCUMENTING MISSISSIPPI'S BOTANICAL DIVERSITY IN THE DIGITAL AGE**

Lisa Wallace[1], Mac Alford[4], Nina Baghai-Riding[3], Christopher Brooks[1], Charles Bryson[6], Gary Ervin[1], Elizabeth Hartfield[5], Lucile McCook[2], Angel Rohnke[5], Heather Sullivan[5], Sherry Surrette[5]
[1]Mississippi State University, Mississippi State, MS, United States, [2]University of Mississippi, University, MS, United States, [3]Delta State University, Cleveland, MS, United States, [4]University of Southern Mississippi, Hattiesburg, MS, United States, [5]Mississippi Museum of Natural Science, Jackson, MS, United States, [6]USDA-ARS, Southern Weed

Science Research Unit, Stoneville, MS, United States

Mississippi lies at the intersection of three floristic provinces and possesses a rich botanical history that is documented in more than 400,000 plant specimens that are housed in eight major herbaria across the state. Many of these collections have become more visible to researchers around the world through recent efforts to develop databases of label data, including the Deep South Plant Imaging Project and Collection and Computerization of the Pullen Herbarium. To extend these efforts to all herbaria we recently developed project *Magnolia grandiFLORA*, which reflects the state tree and flower of Mississippi as well as the collaborative spirit of this project. Through this project, we will develop a publicly accessible database of images, labels and georeferenced specimens, and develop individual herbarium webpages and educational materials. This integrated database will aid in completing a checklist, developing an atlas of Mississippi plants and identifying areas of poorly documented plant diversity, all critical first steps in completing a comprehensive flora. In this presentation we highlight our efforts to develop this collaboration and to integrate with regional portals (e.g., SERNEC) and national efforts (e.g., USVH and NBII). Potential applications of these data include research and educational endeavors in partnership with the Mississippi Museum of Natural Science. Users in Mississippi and elsewhere will have rapid access to plant images, information on species identification, locations and natural history, and collection data for specimens in the eight herbaria. *Magnolia grandiFLORA* will promote Mississippi's rich botanical history and contribute to a greater appreciation of its natural resources.

O4.10
2:15 PATTERNS OF OVIPOSITION FOR CULEX MOSQUITOES IN RESPONSE TO AEDES ALBOPICTUS LARVAE

Anne Winters, Donald Yee
University of Southern Mississippi

Aedes albopictus, an invasive species from Asia, is now the most dominant container species in the southeastern United States and has been found to be a strong competitor against many resident container mosquitoes. The ovipositional response of many Culex to the presence of Aedes albopictus larvae has not been determined, although such information could be useful for understanding the role of interspecies interaction in containers. The purpose of this study was to quantify Culex oviposition in containers across different densities of Aedes albopictus. Field collected Aedes albopictus and Culex eggs were hatched, and first instar larvae were placed in twenty-five containers in the field into which wild adult Culex were allowed to freely oviposit egg rafts. Five replicates of each of the five larval density treatments were established: high Aedes albopictus, low Aedes albopictus, high Culex, low Culex, and a control containing no larvae. Bowls were checked daily and Culex egg rafts were counted. Subsequently, larvae were identified to species in the lab to understand the response of specific Culex species to larval density treatments. Mean differences in egg rafts among treatments will be analyzed using analysis of variance. A preliminary study determined that there were significant differences in the number of Culex egg rafts laid in response to four treatments, with significantly more egg rafts laid in high Aedes albopictus densities and no larvae controls, and fewer in low Aedes albopictus or high Culex containers. These data will help determine if Aedes albopictus larvae affect Culex oviposition.

O4.11
1:15 LYCOPODS, HORSETAILS, AND FERNS OF MISSISSIPPI: FORTY YEARS OF PROGRESS AND CHALLENGES FOR THE FUTURE

Mac Alford[1], Alan Holditch[4], Lucile McCook[2], Heather Sullivan[3]
[1]*University of Southern Mississippi, Hattiesburg, MS, United States,* [2]*University of Mississippi, University, MS, United States,* [3]*Mississippi Museum of Natural Science, Jackson, MS, United States,* [4]*USDA, Natural Resources Conservation Service, Jackson, MS, United States*

The lycopods, horsetails, and ferns (spore-producing plants) are some of the best studied groups of plants in Mississippi. Surprisingly, our knowledge of these groups in Mississippi continues to grow. Since the first major publication on ferns of Mississippi in 1969, the number of species has grown from 43 to at least 79, depending on how various stable hybrids are counted. In fact, this new number is at least 22 more species than the number reported as recently as 1993 in *Flora of North America*. Four major reasons exist for this increase in understanding: (1) increased floristic studies in Mississippi and examination of museum collections from Mississippi,

(2) new introductions, that is, exotic species that have expanded their range to Mississippi, (3) new reports because of surveys for rare species or species near the edge of their distribution, and (4) continued taxonomic work in difficult groups. In the latter case, for example, no species of *Isoëtes* were reported for Mississippi in 1969, and today three are recognized, with the potential of several more. Our current research has resulted in the examination of the region's collections (over 1700 museum specimens), the presentation of an online checklist, and a website with interactive keys. Future challenges include digitizing all herbarium data, preparing an atlas of species distributions, and completing a flora of all plant species in the state.

O4.12
1:30 PHYTOPLANKTON ABUNDANCE AND PIGMENT TAXONOMY COMPOSITION IN COASTAL MISSISSIPPI WATERS

Luz Molina, Donald Redalje
The University of Southern Mississippi, Stennis Space Center, MS, United States

Phytoplankton pigments from Coastal Mississippi waters were measured to determine the spatial and temporal distributions of phytoplankton communities. Concentration of phytoplankton pigments were analyzed using High Performance Liquid Chromatography (HPLC) and the changes in phytoplankton communities were determined with CHEMTAX. Surface water was collected for 2 years (September 2007-November 2009) at three sampling sites on a monthly basis. The stations were located in the Bay of St. Louis, the Mississippi Sound and the Mississippi Bight, following a salinity gradient. A time series of the observations documents variability of the different taxonomic groups in Mississippi waters. Diatoms were the major group in all stations and in all seasons. Cyanobacteria, Euglenophytes, Chrysophytes and Cryptophytes were present at the three sampling sites. Chlorophytes were present in the Bay of Saint Louis and in the Mississippi Sound but absent in the MS Bight. Outside the Barrier Islands Eustigmatophytes and Prasinophytes decreased their concentration while Prymnesiophytes had a higher abundance. Chlorophyll *a* (Chl *a*) concentration had a bimodal distribution with peaks in July 2008 and August 2009 and the highest concentration of (Chl *a*), was found in the Bay of Saint Louis (24µg L^{-1}).

1:45 BREAK

O4.13
2:00 PATTERNS OF EVOLUTIONARY DIVERGENCE OF *LOTUS* (FABACEAE) ON THE CALIFORNIA CHANNEL ISLANDS BASED ON CHLOROPLAST MICROSATELLITES

Gregory Wheeler, Lisa Wallace
Mississippi State University, Starkville, MS, United States

Island systems are ideal for studying evolutionary mechanisms, particularly because they are isolated from mainland sources of gene flow. The California Channel Islands are similar to other island systems, like the Galapagos, because they are oceanic islands that have never been connected to the mainland and house many endemic species; however, the Channel Islands are uniquely close to mainland California, raising questions about the origins and heritage of organisms found on the Islands. In this study, we examine genetic variation in species of *Lotus* endemic to the Channel Islands in order to determine if patterns of diversification can be reconstructed using variation at seven chloroplast microsatellite loci. Several hypotheses are tested in this study: 1) the two endemic *Lotus* species are independently derived from mainland ancestors, 2) the species colonized by independent routes, and 3) gene flow is much more common within than among islands. Preliminary analyses based on a limited set of loci showed extensive variation within populations but little correspondence with taxonomy or geography. The inclusion of all loci provides clearer patterns of divergence with support for the independent evolution of the two species on the islands. Additionally, distance between islands does appear to affect gene flow, but there may be some instances of long-distance dispersal which have stimulated the evolution of new forms. In conjunction with other genetic and ecological data sets, these markers will be useful for understanding how isolation and gene flow have shaped evolution of the Channel Islands flora.

O4.14
2:15 PHYTOPLANKTON PRODUCTION IN THE LOWER MISSISSIPPI RIVER: TEMPORAL VARIATION AND REGULATING FACTORS

Clifford Ochs, Orathai Pongruktham
University of Mississippi, University, MS, United States

Temporal patterns in phytoplankton biomass, gross production (GPP), respiration (R_a) and net production (NPP = GPP-R_a) were documented at two locations in the main channel of the Lower Mississippi River (LMR) separated by approximately 420 river kilometers. Measurements (n = 66) were made for 43 months during all seasons near Tunica, MS, and 15 months near Vicksburg, MS. Phytoplankton biomass varied between 3-24 mg chlorophyll m^{-3} (60-480 mg C m^{-3}). Transport of phytoplankton biomass past our primary sample site ranged from 162,000 kg C day^{-1} during July-October to 252,000 kg C day^{-1} during March-June, and on an annual basis was 70 X 10^6 kg C. Phytoplankton biomass and NPP varied among seasons and years with variation in river discharge, depth and turbidity. NPP was almost always negative (GPP< R_a) in spring and early summer, when discharge, depth and turbidity were high, although this was the time of maximum transport of phytoplankton biomass. In contrast, during the low-water period of July-October, when the suspended sediment load was reduced, areal NPP was usually positive (GPP>R_a), averaging 168 mg C m^{-2} day^{-1}. We suggest that during high-water, LMR phytoplankton biomass was derived from sources outside the main channel, such as connected floodplain lakes, whereas during the low-water period, phytoplankton biomass was largely derived from production in the main channel. The pattern among years in river discharge, phytoplankton biomass and NPP suggest the influence of climatic variation in the Mississippi River Basin on the LMR phytoplankton community.

O4.15
2:30 EFFECT OF UV-A IRRADIANCES ON LIPID ACCUMULATION IN *NANNOCHLOROPSIS OCULATA*

Rathy Srinivas, Clifford Ochs
University of Mississippi, Oxford, Mississippi, United States

The marine microalga, *Nannochloropsis*, is of economic importance. Under favorable environmental conditions they accumulate structural lipids, mainly polyunsaturated fatty acids, which are used as a cure for several human diseases and as feed in aqua culture. Under stressful conditions they accumulate storage lipids, mainly triglycerides, which can be transesterified to biodiesel. The objectives of this project were (1) to study the effect of UV-A (320 - 400nm) on lipid accumulation in *Nannochloropsis oculata*, and simultaneously look whether reciprocity holds or fails; (2) to study the interactive effect of UV-A and nutrients on lipid accumulation in *N.oculata*. The first objective was accomplished by exposing *N.oculata* cells to three UV-A irradiances (I); 6, 12, and 24 Wm^{-2}. Each irradiance had three different durations of exposure (T) such that they resulted in three Doses (I x T); 24, 48 and 72Jm^{-2}. If the same doses have a similar effect, irrespective of UV-A irradiance and duration of exposure, reciprocity holds. Lipid analysis was done using the lipid soluble fluorescent dye Nile Red. After 7 days of incubation, results showed treatments were generally higher than control in lipid content, and reciprocity held. For the second objective *N.oculata* cells were exposed to irradiance of 6Wm^{-2} for 12hrs (dose 72 Jm^{-2}), and grown in low and high nutrient mediums. After 7 days, treatments with UV-A and low nutrients had the highest lipid content.

2:45 DIVISIONAL BUSINESS MEETING

Poster Presentation (Following Dodgen Lecture)

P4.01
TOXICITY CHANGES IN SOIL AND WATER SAMPLES FROM NEW ORLEANS' NINTH WARD: FIVE YEARS AFTER KATRINA

Louis Hall, LaTontenisha Meeky, Rodriquez Thormond, Mack Felton
Mississippi Valley State University, Itta Bena, MS, United States

After Hurricane Katrina, soil and water samples were taken from areas affected by Hurricane Katrina in New Orleans's ninth ward. Five years later, samples were taken from the same location to ascertain if the toxicity of the area had significantly changed. All sample sites had been submerged by waters of Hurricane Katrina. Samples were analyzed using a Delta Tox System which is used to screen and monitor environmental samples using *Vibrio fisheri* to determine toxicity. Percent light gained indicate less toxicity and percent light loss indicate more toxicity. Forty five percent (45%) B-Tox test procedures were used with samples. This procedure was used based on the study done five years prior. The toxicity of the water sampled ranged from -53% to + 7% bioluminescence with a pH range of 7.95 to 8.77. The toxicity of the soil samples taken ranged from - 33% bioluminescence to + 70% bioluminescence. Five years prior, the toxicity of the water sampled inshore -30% to + 68%

bioluminescence with a pH range of 6.62 to 7.98 The toxicity of the soil sampled ranged from -37% to +6%. The pH had a range from 6.06 to 8.10. These data indicate that both the soil and water are decreasing in toxicity. Samples should be taken in five more years to ascertain if this trend continues.

GEOLOGY AND GEOGRAPHY
Chair: John Banks, MS Dept. of Environmental Quality
Vice-chair: Asim Yousafzai USM

THURSDAY MORNING
Room 229

O5.01
9:00 ANALYSIS OF THREE-DIMENSIONALLY RECONSTRUCTED MARINE CLAY FABRIC AT THE NANOMETER SCALE

Jessica R. Douglas[1], Kenneth J. Curry[1], Richard H. Bennett[2]
[1]University of Southern Mississippi, Hattiesburg, MS, United States, [2]SEAPROBE, Inc., Picayune, MS, United States

Clay fabric develops from three well recognized types of fabric signatures formed as edge-to-edge, edge-to-face, and stepped face-to-face contacts of clay platelets (domains). Fabric signatures form nano- and micro-scale structures called aggregates, the building blocks of fine-grained sediment. Our study employs transmission electron microscopy to study nano- and micro-scale fabric from which we create three-dimensional representations of laboratory consolidated surficial marine sediment consisting of 90% illite and 10% smectite. We have refined a technique to obtain ultra-thin serial sections which are photographically mapped, assembled as mosaics, serially stacked, and reconstructed electronically using image analysis software to render three-dimensional representations of clay fabric. These three-dimensional representations provide both qualitative and quantitative characterizations of the fabric that go beyond the descriptions and measurements typically derived from standard two-dimensional photographs of clay fabric. Here we demonstrate three-dimensional representations and discuss our current analysis strategies, for example, measurements of tortuosity and estimates of porosity (accessible and inaccessible), contrasting these with their two-dimensional counterparts. Organic matter can have a significant effect on clay fabric. However, organic matter is typically electron transparent and can only be visualized with transmission electron microscopy using specialized stains. Ultimately, we shall use our three-dimensional techniques to apply qualitative and quantitative analyses to the three-dimensional pattern of organic matter sequestered in marine clay fabric.

O5.02
9:20 SPHAEROCYPRAEA, A "LIVING FOSSIL"

David T. Dockery III
Mississippi Office of Geology, Jackson, Mississippi, United States

Sphaerocypraea is a large shell in the Family Ovulidae (egg cowry shells), known largely from the Eocene of Europe and the Late Eocene of Mississippi. French cypraeid expert Luc Dolin first recognized this genus in Mississippi when he (Dolin and Dolin, 1981) placed *Austrocypraea towncreekensis* Dockery, 1977, as a synonym of *Sphaerocypraea jacksonensis* (Johnson, 1899). In an article entitled "A shell from Mars" (*American Conchologist*, December 2007), Peter Dance told of a Recent shell collected by a Russian trawler from a depth of about 100 meters near the coast of Somalia that was so different it was named *Chimaeria* (a fabled monster made up of parts of other creatures) *incomparabilis* by shell dealer Bruno Briano in 1993. Donald Dan, who sold four of the six known specimens of this new species, recounted (*American Conchologist*, September 2008) the time he showed the new species to Luc Dolin. Luc instantly connected the shell with the "extinct" genus *Sphaerocypraea* and said, "It is truly a living fossil." Dan sold two *Sphaerocypraea* specimens to a collector who donated them to the American Museum of Natural History (AMNH) in New York, one of which was later stolen by the museum's appraiser and sold over the Internet to a collector in Brussels for $12,000. The shell was resold to an Indonesian collector for $20,000. The appraiser, a Florida dealer, was arrested for a federal offence, and the shell was eventually returned to the AMNH.

O5.03
9:40 PRELIMINARY REPORT OF BED-MATERIAL ANALYSIS OF THE BOWIE RIVER ALONG THE IN-STREAM SAND AND GRAVEL MINES AT HATTIESBURG, MS

Joseph Grimball, Franklin Heitmuller
University of Southern Mississippi, Hattiesburg MS, United States

Substantial in-stream sand and gravel mining of the Bowie River near Hattiesburg, Mississippi, occurred from 1946 to 1995. Effects are imprinted on the river system although mining is no longer practiced. The goal of this project is to characterize the bed material upstream, downstream, and at the location of the extraction pits to assess short-term (yearly to decadal) effects of the former mining activities. A preliminary model of sediment inputs and outputs to the affected reach has been developed using bed-material samples and depth measurements. Individual in-stream gravel pits are characterized by an increase in depth and concomitant decrease in bed material size from up- to downstream. River reaches connecting gravel pits are stable if incised into bedrock of the Hattiesburg Formation, but are unstable if flowing through sand and gravel alluvium. Relatively coarse grained sand and gravel inputs to individual pits are supplied by: 1) the natural channel for the upstream pit or 2) unstable connecting reaches to subsequent pits. Based on depth measurements considerable volume still exists for sediment storage. The close proximity of the confluence with the Leaf River warrants further investigation of the downstream impacts of in-stream sand and gravel extraction in the Bowie River.

10:00 BREAK

O5.04
10:20 MAASTRICHTIAN (UPPER CRETACEOUS) MARINE BRYOZOA FROM MISSISSIPPI

George E. Phillips[1], Paul D. Taylor[2], Frank K. McKinney[3]
[1]Mississippi Museum of Natural Science, Jackson, Mississippi, United States, [2]Natural History Museum, London, United Kingdom, [3]Appalachian State University, Boone, North Carolina, United States

The only published report of a bryozoan from the Maastrichtian of Mississippi is the cheilostome *Dysnoetopora celleporoides* Canu & Bassler, which is seemingly ubiquitous in the latest Cretaceous of eastern North America. Between 2006 and 2010, many bryozoan specimens were collected (on hands and knees) from various marine Upper Cretaceous localities in northeast Mississippi. The sampled Maastrichtian units were, from oldest to youngest, the "Troy beds" (lower Ripley Formation, Pontotoc County), Coon Creek beds (lower Ripley Formation, Union County), undifferentiated Ripley (Oktibbeha County), Chiwapa Sandstone (upper Ripley Formation, Pontotoc County), typical Prairie Bluff marl (Oktibbeha, Clay, and Pontotoc Counties), "Nixon sand" (sandy facies of the Prairie Bluff Formation, Pontotoc County), and Owl Creek Formation (Union County). The Mississippi samples consisted of two growth forms of calcareous epifaunal bryozoans--erect and encrusting. The detectable Maastrichtian diversity was high at nearly two dozen species belonging to nine families of Cheilostomata and two families of Cyclostomata. Cheilostomes were distributed among all units sampled but cyclostomes were found only in the Prairie Bluff Formation. Several cheilostome families were also found only in the Prairie Bluff. Scanning electron microscopy has revealed several new species. These include a new species of *Dysnoetopora* differing from *D. celleporoides* in the morphology of the avicularia (defensive zooids), and a new genus resembling *Dysnoetopora* in constructing branched, ‘celleporiform' colonies but having feeding zooids with an orificial sinus.

O5.05
10:40 THE MISSISSIPPI GEOLOGICAL SURVEY 150, 100, AND 50 YEARS AGO

Michael B. E. Bograd
Mississippi Office of Geology, Jackson, MS, United States

The Mississippi Geological Survey, now named the Mississippi Office of Geology, has a long history of mapping the state's geology, mineral resources, soils, agricultural resources, forest resources, and topography. The agency has evolved with changing societal needs to provide information vital to the economy of the state. In 1860 Dr. Eugene W. Hilgard published the "Report on the Geology and Agriculture of the State of Mississippi," which served as the key reference on those topics for over half a century. The appropriations for the Survey were maintained by the state in 1861 and throughout the Civil War, and Dr. Hilgard remained on duty. In 1910 the Survey was working on county soil surveys in cooperation with the US Bureau of Soils (while mapping topography with plane table and alidade),

published a bulletin on the forest resources of Mississippi, and was completing bulletins on soils and on structural materials. A new state geologic map had been published in 1907; in 1910 geologic mapping was being done at a statewide reconnaissance scale. By 1960 the Survey was publishing annually one or more county geologic bulletins with county geologic maps at one inch equals two miles. In 1960 and 1961, the Survey published three county bulletins, a report on water supplies in northern Mississippi, and two bulletins on geomorphology, stratigraphy, and structure along highways 16 and 80. Today the Office of Geology is active in applied and environmental geology, digital mapping, mine reclamation, and detailed geologic mapping at a scale of 1:24,000

O5.06
11:00 FLUVIAL GEOMORPHOLOGY OF TURKEY CREEK: AN ANALYSIS OF IMAGERY FROM 1940 TO PRESENT OF LAND USE CHANGES IN THE TURKEY CREEK WATERSHED IN HARRISON COUNTY, MISSISSIPPI

David Holt
The University of Southern Mississippi, Long Beach, MS, United States

Low altitude, aerial imagery has been acquired for the catchment basin for Turkey Creek from 1940. This imagery is before any larger developments occurred in the now developed basin. A map shows the early land use, location of the river channel, forested and wetland areas. Subsequent imagery reveals changes in these attributes over time. The fluvial geomorphology can be inferred as wetlands are developed and the river is channelized in areas. Various development in the area (establishment of an airport, interstate, retail areas) has changed the flow regime of the stream that has manifested itself as a morphological agent recorded in aerial imagery. With the planned interstate-port connector bisecting the watershed, estimations of fluvial geomorphology can be inferred.

11:20 BREAK

Thursday Afternoon
Room 229

O5.07
1:00 GROUNDWATER FLOW IN NORTHWEST MISSISSIPPI'S ALLUVIAL AQUIFER

Pat Mason
Mississippi Office of Land & Water Resources, Jackson, MS, United States

Mississippi's Office of Land & Water Resources built a large and complex groundwater flow model in order to understand and quantify flow mechanisms in the shallow alluvial aquifer which underlies Mississippi's "Delta" plain, and to help assess the future of groundwater supply in the Delta counties.

Most recharge was quantified by estimating rainfall infiltration rates through non-hydric soils distributed in zones confined to the alluvial fan belt, the margins of the Mississippi River, and the Deer Creek natural levee deposits. Most discharge was quantified by a rainfall-response method of estimating irrigation water use based on detailed crop data and rainfall data calculated for 7420 one-mile square grid cells. The extent to which other minor recharge and discharge pathways affect water levels was revealed during the calibration process. These include the beds of major and bluffline streams, the variable head boundaries of the bluffline and the Mississippi River, and movement to and from the underlying Tertiary aquifers such as the Sparta and Cockfield. Forward scenarios run using the model predict declining groundwater levels in the central Delta counties sufficient to create locally severe problems for agriculture at current withdrawal rates. Various conditional 'what-ifs' were tested using this model framework. For example, significant drawdown of an underlying Tertiary aquifer could have dramatic negative results on water supplies in the alluvial aquifer.

O5.08
1:20 RARE EARTH ELEMENT (REE) PLACER DEPOSITS OF THE MISSISSIPPI EMBAYMENT

David Thompson
Mississippi Office of Gelology, Mississippi, United States

Demand and prices for REE continue to rise, while supply is limited. Currently, 97% of the supply

is produced in China, and Chinese export shipments are increasingly unstable and problematic. These crucial materials have extensive military and commercial utilization. While REEs are relatively abundant in the Earth's crust, known economic concentrations are not plentiful. The most abundant rare earth elements are cerium, yttrium, lanthanum and neodymium. The largest percentage of worldwide rare earth economic resources correspond to Bastnäsite deposits in China and the U.S., while the second largest portion is comprised of monazite deposits in Australia, Brazil, China, India, Malaysia, South Africa, Sri Lanka, Thailand, and the U.S. The Mississippi Embayment holds heavy mineral (HM) placer deposits, which contain REE. Assessment of surface geochemical anomalies indicates that certain sandy facies of Cretaceous and Tertiary deposits are relatively higher for REE, compared to the Embayment at large. Preliminary elemental/mineralogic analyses of certain formations indicate a monazite grade range of 0.8 to 2.1%, and a xenotime grade range of 0 to 0.5%. Gupta and Krishnamurthy (2004) documented worldwide monazite grades from selected placers at 0.007 to 3.2%. Exploitation of Embayment placers would likely require a deposit with overall HM percentage in excess of 2%, with accompanying valuable heavy minerals such as ilmenite, rutile, and zircon. Embayment monazite sand deposits are categorically of the monazite-(Ce) composition, averaging 31% Ce2O3. Further, commercial monazite sands typically contain between 6 and 12% thorium oxide, accentuating recent interest in "green" liquid fluoride thorium reactors for power generation.

O5.09
2:00 SEISMIC TOMOGRAPHY FOR INTEGRITY ASSESSMENT OF EARTHEN EMBANKMENT DAMS

Leti T. Wodajo[1], Craig J. Hickey[1], Daniel Wren[2]
[1]National Center for Physical Acoustics(NCPA), University of Mississippi, Oxford, MS 38677, United States, [2]USDA-ARS, National Sedimentation Laboratory, Oxford, MS 38655, United States

Dams are a vital part of a nation's infrastructure. considering the fact that many of the dams in the United States have approached or are approaching their projected life expectancy of 50 years, this critical infrastructure represent a risk to public safety. Minimizing this risk requires an ongoing safety inspection, monitoring, maintenance and rehabilitation program. This study examines the use of a non-invasive geophysical seismic method to provide additional information where the usual visual inspection is not sufficient and the common boring investigation is not an option. Even though seismic techniques provide valuable information of the subsurface strata, the interpretation is not always uniform and consistent. In this research, we consider three seismic survey techniques known as seismic refraction, multi-channel analysis of surface waves (MASW) and shear wave surveys for the purpose of dam integrity assessment. Multiple surveys were carried out on two earthen dams near Oxford, Mississippi. The results provide insights on the natural seismic variability of earthen dams. Some inferences will be on how seismic tomography images can be used to detect compromised zones(i.e. seepage, piping, etc) within earthen embankment dams. [This work is funded under USDA-ARS Specific Cooperative Agreement: 58-6408-7-234].

2:20 BREAK

O5.10
2:40 ELECTRICAL RESISTIVITY TOMOGRAPHY FOR INSPECTING EARTHEN EMBANKMENT DAMS

Jared Case[1], Craig Hickey[1], Gregory Hanson[2]
[1]National Center for Physical Acoustics (NCPA), University of Mississippi, University, MS 38677, United States, [2]USDA-ARS, Hydraulic Engineering Research Unit (HERU), Stillwater, Ok, 74075, United States

According to the National Inventory of Dams (NID), the number of dams across the United States exceeds 84,000. Many of these dams are more than half a century in age and need careful attention to ensure the safety of these structures. It comes with great difficulty to obtain a full and confident dam assessment just by performing a visual inspection. Many dam problems occur inside, which makes it difficult to be observed by the inspectors. Examples include piping and seepage (flow of water through or around dam walls). It is in this area where geophysical methods can aid in obtaining a better evaluation of a dam's integrity. Electrical resistivity is one geophysical method that would be useful in detecting internal flaws associated with seepage and piping because it is sensitive to changes in moisture. A study is being conducted to examine the feasibility of electrical resistivity tomography (ERT) to map and monitor internal compromised zones within the earthen embankment. Two quarter-

scaled earthen embankment dams were built, at the USDA Hydraulics and Engineering Lab in Stillwater, Oklahoma, with known internal compromised zones that would be susceptible to internal seepage and piping. Electrical resistivity surveys were carried out to map the 2D axial cross section of the dam interior and evaluate the feasibility of the technique. [This research was funded by the Department of Homeland Security-sponsored Southeast Region Research Initiative (SERRI) at the Department of Energy's Oak Ridge National Laboratory.]

O5.11
3:00 EXCAVATION OF AN ISOLATAED BASILOSAURID SKULL FROM THE BASAL YAZOO FORMATION OF YAZOO COUNTY, MISSISSIPPI.

James Starnes[1], George Phillips[2], Krista Clark[3], John Banks[4]
[1]Mississippi Office of Geology, Jackson, Mississippi, United States, [2]Mississippi Museum of Natural Science, Jackson, Mississippi, United States, [3]Millsaps College, Jackson, Mississippi, United States, [4]Mississippi Office of Land and Water Resources, Jackson, Mississippi, United States

In early April, 2010, Jeff McCraw of Bay Springs, Mississippi, reported a fossil bone exposed in a tributary of Tesheva Creek, Yazoo County, Mississippi. Excavation exposed an archaeocete skull encrusted with the oyster *Pynodonta trigonalis.* The specimen was in embedded the Yazoo Clay less than a meter above the Yazoo-Moody's Branch Formation contact, as exposed a few meters downstream. An excavation crew was assembled and consisted of the authors and the following volunteers: Joy Rushing, Sean McGregor, Scott Peyton, Peter Kuchirka, Jeremy Copley, John David McKeigney, Megan Ellis, Jim Leonard, Andy Sanderson, and Aaron Francois of the Mississippi Museum of Natural Science (MMNS); and Robert Berry and Dakota Guillory of Millsaps College. The excavation involved building an in-stream diversion dam around the specimen with available materials: sand, clay, and gravel. The specimen was isolated in a block of matrix by trenching and pedestaling. Water was manually bailed from the excavation, and the specimen was jacketed in plaster and removed. The specimen (MMNS RN-8679) was extracted from the block at the MMNS by Joy Rushing and Peter Kuchirka. The skull lay ventral side down and measured 107 cm in length. Elements include a portion of the paired premaxillae containing alveoli for the second and third incisors; maxillae with most of the premolars (PM) intact (right PM4, PM3, PM2; left PM4, PM3, the last loose in matrix); the jugals, zygomatic processes, squamosals, and exoccipital are largely intact. The dorsal cranial elements were missing from the horizon of the nasal through the parietal.

O5.12
3:20 A COMPARATIVE ANALYSIS OF DISASTER RISK REDUCTION APPROACHES TO THE 2010 FLOODING OF SOUTH ASIA

Asim Yousafzai, Bandana Kar
University of Southern Mississippi, Hattiesburg, MS, United States

The Pakistani and Chinese flooding of 2010 are examples of the devastating social, economic and environmental impacts of riverine flooding. The recent flooding of Pakistan's Indus River and its tributaries caused the death of about 4,500 people and an estimated damage of 4.3 billion dollars. Acording to the United Nations, these floods have affected more people than the 2004 Indian Ocean tsunami, the 2005 Kashmir earthquake, and the 2010 Haiti earthquake combined. Likewise, landslides due to 2010 flooding of Hwang Ho or "Yellow River" in China killed more than 1,200 people.

Preparing for such events through mitigation is fairly common, at least in the United States where building codes, land-use regulations and flood insurance are often adopted to minimize potential losses. However, this is not always the case in developing countries due to governance problems. It is, therefore, pertinent to develop preparedness plans that will aid in mitigation, response and recovery efforts to protect people from future events. Preparing such a plan, however, will require answering some of the following questions: (1) what would be the potential flood impact zone in future due to climate change and changes in hydrologic conditions, and (2) how many people would be impacted by such an event due to their socio-economic conditions and adaptation of mitigation policies? In this study, an attempt is being made to answer these questions in the context of Pakistan and China, two broadly differing communities. Lessons learned in one country can probably be extended to the other country.

O5.13
3:40 MEASURING IN-SITU STRESS OF EARTHEN EMBANKMENTS

Binyam Tadese, Jared Case, Leti Wodajo, Craig Hickey, Zhiqu Lu
The University of Mississippi, Oxford, Mississippi, United States

The redistribution of stress in the vicinity of subsurface excavations has been studied for many years in the field of tunnel engineering. The distribution of stress might play an important role in the interpretation of seismic images of the subsurface. The shear stiffness of a soil is the shear stiffness of the skeleton and is much lower than the shear stiffness of the particles. In soils that are 100% water saturated the bulk stiffness is a function of the porosity, bulk stiffness of fluid, and the bulk stiffness of the particles (Santamarina, 2001). However, a small amount of air makes the bulk stiffness of the soil a function of the stiffness of the skeleton. The stiffness of the soil skeleton is controlled by the stiffness of the interparticle contacts which depends upon the degree of cementation, and the confining stress. Capillary forces can contribute to the contact stiffness of partially saturated soils by increasing the effective stress. The importance of capillary forces decreases with increasing confining stress, increasing particle size, and increasing water content. In this presentation we will describe a sensor to measure in-situ stress. The in-situ stress is calculated from the measured deformation (strain) of a rubber cube embedded in the granular material. Laboratory measurements for a simple loading of sand material are compared to model predictions using the Comsol™ software. [This research was funded by the Department of Homeland Security-sponsored Southeast Region Research Initiative (SERRI) at the Department of Energy's Oak Ridge National Laboratory.]

Friday, February 18, 2011

Friday Morning
Room 229

O5.14
9:00 A DRAINAGE-BASIN ASYMMETRY INVESTIGATION OF POSSIBLE NEOTECTONIC DEFORMATION WITHIN THE BIG BLACK RIVER NEAR EDWARDS MISSISSIPPI

Alex Aguilar, Zachary Musselman
Millsaps College, Jackson, MS, United States

Using 7.5 minute USGS topographic quadrangles and a rapid quantitative technique, we investigated possible neotectonic activity within the Big Back River (BBR) system. The specific area of investigation is located WNW of Edwards, MS where the BBR appears to be shifted laterally within its alluvial valley. Little work has been done in the area to attempt to identify a cause of the lateral shift of the BBR channel. This study determined the Asymmetry Factor of tributaries entering the BBR over an approximately 130 km reach. The entire study reach was divided into three sub-reaches defined by alluvial valley and active floodplain width, sinuosity and slope. The upper and lower reaches within the study area have similar sinuosity as the entire BBR, while the middle reach's sinuosity drops below the 1.5 meandering threshold and is a straight channel. Channel and valley slopes and sinuosity were also measured in the tributaries flowing into the three sub-reaches. The average tributary channel and valley slopes within the middle reach are nearly double the slopes within the upper and lower reaches. Morphometric measurements of asymmetry factor within tributaries of the three sub-reaches suggest minimal lateral shifting of stream channels in the study area. The small tributaries measured in this study may reflect a more localized control on morphometry and might not reveal deformation caused by tectonic activity.

O5.15
9:20 SEDIMENTATION AT THE WOOLSEY GAS-VENT COMPLEX IN THE NORTHERN GULF OF MEXICO

Charlotte Brunner[1], Wes Ingram[2], Stephen Meyers[2], Carol Lutken[3]
[1]University of Southern Mississippi, Hattiesburg, MS, United States, [2]University of North Carolina, Chapell Hill, NC, United States, [3]Mississippi Mineral Resource Institute, University of Mississippi, Oxford, MS, United States

Sedimentary evidence at the Woolsey gas vent complex at Mississippi Canyon Federal Lease Block 118 (MC118) in the northern Gulf of Mexico suggests that active processes have reduce sediment accumulation at the site during the last 12.7 Ka. The complex, located at the Methane Hydrate Seafloor Observatory, which is overseen by the Gulf of Mexico Hydrates Research Consortium, consists of

three active gas vents in different stages of evolution, with associated hardgrounds, chemosynthetic vent faunas, and four faults above a salt body 200 m below the sea floor. Isochronous horizons were mapped through 40 gravity cores collected within the complex and 13 cores collected from the surrounding region to represent background sedimentation. The ages of key bio- and lithostratigraphic levels were interpolated from radiocarbon-dated intervals, and isopach maps were constructed between the dated horizons. Results clearly show that sedimentation in the vent complex is significantly slower than in the surrounding region, despite the accommodation space available in the complex crater. We infer that processes active in the complex reduce sediment accumulation in several ways: 1) by expulsion of gas/fluids, growth and decay of methane hydrate deposits, and fault motion, all of which can re-suspend sediment that could drift from the area in suspension or as dilute turbidity flows on the seafloor; and 2) sediment thinning due to chemical transformation of solids into solutes and gases or into more dense solids (hardgrounds) through diagenesis. The processes have been active at the site for at least the past 12.7 Ka.

O5.16
9:40 ESTIMATION OF MASS BALANCE OF GANGOTRI GLACIER USING ALOS PRISM SATELLITE IMAGE

Kabindra Joshi, Shrinidhi Ambinakudige
Mississippi State University, Starkville, MS, United States

Glaciers are key indicators of climate change. The Himalayan Mountains are home to some of the longest glaciers in the world. Retreats of glaciers are more rapid and expected to continue in the future in the Himalayas. To understand the complex link between the retreats of Himalayan glaciers and climate change, measuring and monitoring Himalayan is crucial. However, high altitudes, and the presence of debris on the glaciers make In-situ method of studying glaciers challenging, expensive, and often impractical. In these circumstances, remote sensing technology is a highly valuable to monitor and measure the mass balance of glaciers. Records of mass balance of the Himalayan glaciers are sparse. Therefore, in this study we developed a technique to calculate mass balance of glacier using ALOS PRISM satellite image. The study was conducted in the Gangotri glacier in the Indian Himalayas. The result indicated significant change in the mass balance of Gangotri glacier over the study period.

Key words: Mass Balance, Himalayas, Glacier, ALOS.

10:00 BREAK

O5.17
10:20 SURVEY OF ECONOMIC RESILIENCY OF SIX MISSISSIPPI COUNTIES AND FOUR LOUISIANA PARISHES AFFECTED BY HURRICANE KATRINA.

Benedict Posadas
Mississippi State University, Mississippi State, MS, United States

Six counties in Mississippi and four parishes in Louisiana were examined for their economic resiliency five years after Hurricane Katrina. Through eight socioeconomic variables, their status in the years before the hurricane was compared with the years following the hurricane. The total population, the gross sales, the sales tax collection, the number of business establishments, the annual payroll, and the number of paid employees changed significantly for most of the counties and parishes. The number of new private building permits did not change significantly, though it is clear there was a short housing boom after Hurricane Katrina. The median household income did not change significantly, though it fluctuated from year to year. From the variables that showed significant changes, it is clear that people moved away from the three coastal counties of Mississippi greatly affected by Hurricane Katrina and that businesses have not fully resumed operations in that area. Most of the other counties and parishes benefited from the influx of people and businesses.

O5.18
10:40 THE MYTH OF LOCATION PRIVACY IN THE U.S.: SURVEYED ATTITUDE VS. CURRENT PRACTICES

Bandana Kar, Rick Crowsey, Joslyn Zale
University of Southern Mississippi, Hattiesburg, MS, United States

In the U.S., personal privacy is generally viewed as an individual's fundamental right. The U.S. Constitution, legislation and case law support this view with regards to government violation of privacy. Protection of personal location information, also known as location privacy, has not received

equal attention in the legal systems, although with the explosion of location-based services (e.g., Cell Phones, Electronic Tolling Devices, Parking Meters, Electronic Swipe Cards, etc.) it is possible to obtain an individual's location information easily and precisely. Given the recent popularity of such services and their potential uses and misuses, steps such as obfuscating location data, obtaining consent from individuals for use of their data, and anonymizing data through cryptography have been taken. This effort investigates public perception of privacy and location privacy specifically as a possible explanation for the lack of location privacy protections in the U.S. A snowball collection approach was employed to gather data for the study. Analysis of the 247 responses indicates that this sample is ignorant of the current legal protections and liabilities with regards to location privacy. One interesting outcome is the majority view that there should be location privacy protection similar to HIPPA and FERPA.

O5.19
11:00 TEXTURAL AND MINERALOGICAL ANALYSIS OF THE KONE HILL SAND, RANKIN CO., MISSISSIPPI

Ginny Nippes[1], Stan Galicki[1], James Starnes[2]
[1]Millsaps College, Jackson, MS, United States,
[2]Mississippi Department of Environmental Quality, Jackson, MS, United States

Forty-four outcrop samples obtained from a 4.3 m exposure of sand in Rankin Co., Mississippi (T5N-R4E, NE/4, Sect. 33) were analyzed for particle size and mineralogy. The sand informally known as the Kone Hill Sand lies beneath the Citronelle Formation. A preliminary particle size separation was done to divide the samples at 63 microns. Qualitative analysis of the texture and morphology of the coarse fraction was done using a scanning electron microscope (SEM). The mineralogy of the fine fraction was determined using X-ray diffraction (XRD). The percent fine fraction (< 63 microns) ranged from 2.13 to 20.57% with an average value of 7.45%. SEM images indicate a high degree of conchoidal fracturing, possible triple point morphology typical of tripoli, and particle sizes ranging from 10-30 microns. XRD analysis of the fines indicates the predominance of quartz with trace amounts of kaolinite clay. The coarse grained, cross-bedded, sand is believed to be a tripolitic facies of the Catahoula Formation.

O5.20
11:20 STORMWATER ASSESSMENT OF NUTRIENT LOADING AND E. COLI CONTAMINATION OF TOWN CREEK, JACKSON, MISSISSIPPI

Hunter Berch, Stan Galicki
Millsaps College, Jackson, MS, United States

There has been renewed interest in Town Creek since a plan to create a river walk in the downtown Jackson area by damning Town Creek was proposed. An assessment of aqueous nutrient loading at one site, and the determination of E. Coli contamination from two sites on Town Creek was conducted from April through August 2010. Jackson, Mississippi has a population of over 184,000 residents in the 174 km^2 city limit. Land use within the 34 km^2 Town Creek watershed ranges from residential to light industrial. An automated stormwater sampler took instantaneous and composite samples during storm events. Nitrate-N concentrations ranged from 0.04 to 1461 ppm and total reactive phosphorus ranged from 0.08 to 1.13 ppm. The total dissolved solids ranged from 34 to 6926 mg/l; total suspended solids ranged from 31 to 1143 mg/l. E. Coli concentrations taken from two sites during baseline flow and storm water events display no consistent pattern. The number of E. Coli colonies per 100 ml of water ranged from 0 to 80,000.

11:40 DIVISIONAL MEETING

HEALTH SCIENCES

Co-Chair: Kenneth Butler, University of Mississippi Medical Center
Co- Chair: Stanley Smith, University of Mississippi Medical Center

February 17, 2011

THURSDAY MORNING
BALLROOM I

9:00 Drug Delivery Symposium—Systems and Applications 2011 Introduction
Hamed A. Benghuzzi, University of Mississippi Medical Center

O6.01
9:15 THE MACROPHAGE RESPONSE TO AMINO ACID COATED UHMW-PE IMPLANTS IN SOFT TISSUE

Kenneth Butler, Hamed Benghuzzi, Michelle Tucci, Aaron Puckett
University of Mississippi Medical Center

Polyethylene materials used in orthopedic applications are biocompatible and non-immunogenic with host tissues. Recent studies in our laboratory have demonstrated the need for further study of these devices in vivo to further elucidate methods to modulate the tissue-implant response. The purpose of this investigation was to determine macrophage behavior resulting from the implantation of ultra high molecular weight polyethylene (UHMW-PE) coated with saline, poly-L-lysine (PLL), argentine-glycine-aspartic acid (RGD), and argentine-glycine-glutamic acid (RGE) at 90 days post-implantation. In this investigation, implants of UHMW-PE coated with saline, PLL, RGD, and RGE were implanted into 16 adult male rats intraperitoneally (I/P). At 90 days post-implantation, the animals were euthanized; and the UHMW-PE implants and the fibrous tissue capsules surrounding them were harvested. Evaluation of routinely stained sections (5 microns, Hematoxylin & Eosin) of the fibrous tissue capsules revealed macrophage counts were highest in the saline coated group (10±3 cells/high power field). Amino acid coated implants resulted in decreased mean macrophage counts per high power field for RGD (4±2), RGE (3±2), and PLL (4±3) compared to saline. Differences in macrophage counts between saline and the three amino acid treated groups were statistically significant (ANOVA, $p < 0.05$). These findings indicate macrophage behavior at the tissue-implant interface and in surrounding fibrous tissue can be reduced using various amino acid combination coatings. In addition, these findings provide evidence that the intensity of the chronic inflammatory reaction to implantable biomaterials can be reduced and more controlled.

O6.02
9:30 A NEW MODEL FOR ACHILLES TENDON REPAIR IN THE RAT

David Black, Tracye Lawyer, Michelle Tucci, Hamed Benghuzzi, Sheila Lindley
University of Mississippi Medical Center

The Sprague-Dawley rat is an excellent model for studies of Achilles tendon repair. Most researchers use a modification of the Kessler technique for suture repair of the Achilles tendon in rats. While this technique provides adequate strength, early mobilization is not recommended. Prior to healing, the load will be borne completely by the suture repair, subjecting it to rupture. To prevent this complication, investigators employing the Kessler repair often immobilize the operative extremity with a cast or splint. This has also been shown to be detrimental to the peak load borne by the tendons prior to rupture.

A double-loop locking technique of suture repair for rat Achilles tendons is favored over the modified Kessler technique. As force is applied across the repair, the suture pulls on the tendon, sharing the load. This allows for early mobilization of repaired tendons, with minimal risk of rupture. Additionally, no immobilization is required for the operative extremity.

One hundred repairs have been performed using this double-loop locking technique. All animals have been able to mobilize with minimal limp immediately after recovering from anesthesia, and there have been no ruptures. No other complications have occurred (hematoma, seroma, infection, dehiscence). This technique of tendon repair is ideal for use in studies of tendon repair in the rat, since it is easy to perform and eliminates the need for immobilization of the operative leg.

O6.03
9:45 THE EFFECT OF ANDROGEN ADMINISTRATION ON THE MACROPHAGE IN THE TISSUE IMPLANT RESPONSE

Kenneth Butler, Hamed Benghuzzi, Michelle Tucci, Aaron Puckett
University of Mississippi Medical Center

Macrophages are a critical component in the biocompatibility of implantable ceramic materials. As part of the chronic inflammatory response, these cells surround the implant, establishing the tissue-implant interface, and produce cytokines critical for recruitment of other complementary cells involved in the response. The purpose of this study was to evaluate the effect of androgens on behavior of the macrophage by further quantifying their presence in the fibrous tissue capsule and at the tissue implant interface of calcium phosphate ceramic drug delivery systems and assessing their cytokine activity. Sixteen animals in four experimental groups were implanted with one TCP bioceramic each. Group I animals were implanted with a sham TCP ceramic not containing a steroid hormone (control group). Group II animals received the testosterone loaded TCP ceramic. Group III animals were implanted with the dihydrotestosterone loaded ceramic. Group IV animals received the androstenedione ceramic. At 90 days post-implantation, the animals were euthanized. The implants and fibrous tissue capsules were then extracted. Determination of macrophage populations and their behavior was conducted microscopically following H&E and IHC staining of antibodies to IL-1β, IL-2, IL-6, and TNF-α positive cells. All three of the hormones administered in this study, particularly androstenedione, significantly affect macrophage migration to the implant interface and surrounding fibrous tissue capsule when compared to the control group. In addition, these hormones limit the expression of cytokines severely limiting recruitment of other cells involved in the tissue-implant response.

O6.04
10:00 DRUG DELIVERY SYSTEMS AND APPLICATIONS—2011 UPDATE
Ateegh al-Arabi, Johnson County Community College, Overland Park, KS

Nanotechnology Based Drug Delivery Systems

THURSDAY AFTERNOON
Poster Session I – 1:15-4:00 PM

P6.01
THE EFFECT OF ORALLY ADMINISTERED *MORINGA OLEIFERA* ON *TRYPANOSOMA* INFECTED RATS

Grace Martin, Jessica Wiseman
Belhaven University

Trypanosoma lewisi is a nonpathogenic blood parasite that is related to the causative agents of Human African Trypanosomiasis. In this study *Moringa oleifera*, a plant used throughout the world for nutritional and medicinal purposes, was used to determine its effect on the level of parasitemia. Rats were divided into four groups, consisting of three experimental groups and a control group. Four rats were assigned to each group. Two experimental groups received a five-day pretreatment where *M.oleifera* was administered in the drinking water. The dosage used for all groups receiving treatment was 200mg/kg. For one of the pretreated groups, treatment continued after inoculation. For the second pretreated group, treatment was discontinued following inoculation. The third expierimental group recieved treatment starting after inoculation. The control group recieved no treatment prior to or after incolulation. Except for the pretreatment, *M oleifera* extract was administered orally using gavage techniques. All the experimental groups showed reduced parasitemia levels and decreased durations of infection compared to the control group. ANOVA statistical analysis revealed that there was a significant difference between both of the pretreated groups and the control group. The pretreated experimental groups did not experience the typical two-peak infection period that is characteristic of *T. lewisi* infections.

P6.02
ANALYSIS OF TOBRAMYCIN RELEASE FROM BETA TRICALCIUM PHOSPHATE PASTE

Simeyon Butler, Leena El-Sadek, Michelle Tucci, Hamed Benghuzzi
University Mississippi Medical Center

The purpose of this pilot study was to determine the in-vitro release properties of tobramycin by tricalcium phosphate (TCP) paste. Two different forms of TCP capsules, matrix and reservoir, were characterized. Two types of TCP paste were constructed: three sham TCP paste (Group A) and three tobramycin loaded TCP paste (Group B). The TCP paste samples were placed in a 24 well plate and allowed to solidify and dry overnight. The material submerged in 1 mL of PBS and 1 mL and elutant were collected and replaced every 10 min for the first hour and then hourly for the next 8 hours. Sampling continued every 24 hours for the next 3 days. The elutant (10

uL) from selected capsules was placed onto bacterial discs and placed on confluent *Staphylococcus aureus* agar plates to evaluate zones of inhibition. There was a statistically significant difference in the concentration of tobramycin released between Group A versus Group B a over a 3 day period. Bacterial discs containing Group A elutant did not have a visible zone of inhibition, while Groups B elutant discs had an appreciable zone of inhibition for the duration of the study. Group A sham paste eluted no antibiotics implying that TCP by itself lacks antibacterial properties. Group B paste eluted sustained tobramycin concentrations that were bactericidal for the duration of the study. The data from this study demonstrates that the sustained release property of tobramycin loaded TCP matrix allows for a suitable mode for local antibiotic delivery (Supported in part by an award from the Howard Hughes Medical Institute (Base Pair Program).

P6.03
THE EFFECTS OF GREEN TEA, WHITE TEA, EGCG, AND CAFFEINE ON *TYPANOSOMA LEWISI* INFECTED RATS

Jonathan Kalehoff, Jarrett Morgan, James Presgraves, Christopher Richmond, Isaiah Tolo
Belhaven University

Trypanosoma lewisi, a non-pathogenic protozoan blood parasite, is a close relative of the protozoan that causes African sleeping sickness. Trypanosoma lewisi is a valuable asset in the search for effective treatments on African sleeping sickness because of its low pathogenicity. This experiment used two teas brewed from the leaves of Camellia sinesis, green tea and white tea and two active ingredients found in each, epiepigallocatechin-3-gallate (EGCG) and caffeine to study their effects on parasitemia. Green tea has been known to have positive health benefits but has only recently been studied scientifically; white tea is known to have more antioxidants and less caffeine; EGCG is a well studied antioxidant that has antiproliferative effects; caffeine is hypothesized to suppress rapidly dividing cells. Twenty-two rats were divided into five groups of four rats each: green tea, white tea, EGCG, caffeine, control, and a group of two rats designated reservoir. Among the treatment groups no significant decrease in parasitemia was found when compared to the controls; however there was a significant decrease in parasitemia when the tea groups were compared with the active ingredient groups.

P6.04
A THERMALLY RESPONSIVE S100B INHIBITORY PEPTIDE TO TREAT SCA1

Scoty Hearst, Henry A. Murphy II, Leslie Robinson, Mariper Lopez, Qingmei Shao, Gene Bidwell, Drazen Raucher, Parminder Vig
University of Mississippi Medical Center

Spinocerebellar ataxia type 1 (SCA1) is a dominantly inherited neurodegenerative disease caused by a mutation in the ataxin-1 protein. SCA1 is associated with progressive ataxia resulting from the loss of cerebellar Purkinje cells (PCs) and neurons in the brainstem. In SCA1 transgenic mice, the most prevalent features of disease are the presence of nuclear inclusions and the development of cytoplasmic vacuoles in PCs. Recently, we reported that Bergmann glia protein S100B localize to SCA1 PC vacuoles, where S100B vacuolar formation leads to alterations in PC dendritic spines. Currently, it is not clear if S100B plays a role in the SCA1 pathology. However, we hypothesize that high levels of S100B may exacerbate the SCA1 disease by causing oxidative stress to SCA1 PCs. S100B is a known RAGE ligand, where S100B-RAGE signaling has been shown to increase the formation of reactive oxygen species (ROS). To combat the S100B induced oxidative stress, we have designed a selective thermally responsive S100B inhibitory peptide, Synb1-ELP-TRTK. Our therapeutic polypeptide was developed using three key elements: (1) an elastin-like polypeptide (ELP), a thermally responsive peptide, (2) TRTK12 peptide, a known S100B inhibitory peptide (3) a cell penetrating peptide, Synb1, to enhance the intracellular delivery. Overall, our preliminary data suggests that thermal targeting of Synb1-ELP-TRTK to the SCA1 cerebellum may reduce S100B induced oxidative damage and improve the SCA1 pathology warranting further in vivo studies. Supported in part by an award from the Howard Hughes Medical Institute (Base Pair Program)

P6.05
THE PROGRESSION OF RENAL INJURY IN DIABETIC DAHL SALT-SENSITIVE RATS

Denisha Spires[2], Jan Williams[1], Adrienne Wells[1]
[1]Department of Pharmacology and Toxicology, University of Mississippi Medical Center, [2]Murrah High School

Diabetic nephropathy is the most common cause of chronic kidney failure and end-stage renal disease (ESRD) in the United States. However, little is known about the pathogenesis of diabetic nephropathy because the lack of an appropriate rodent model. The Dahl salt-sensitive (S) rat is a genetic model of salt-sensitive hypertension that develops proteinuria and focal glomerulosclerosis that progresses to ESRD. The present study examined whether the Dahl S rat could be used as a model of diabetic nephropathy. Telemetry transmitters were implanted in 9 week-old rats to measure mean arterial pressure (MAP). Rats were then separated into two groups: (1) vehicle and (2) streptozotocin (STZ, 50 mg/kg, i.p.) to induce diabetes. At 18 weeks of age, we observed no differences in MAP: vehicle (116±3 mmHg) vs. STZ (110±4 mmHg). Protein excretion increased to 54±6 mg/day in vehicle treated rats vs. 338±37 mg/day in STZ treated rats. Dahl S rats treated with STZ exhibited renal histological abnormalities including mesangial expansion, focal glomeruloslcerosis, and interstitial fibrosis which are all typical of diabetic nephropathy. In conclusion, these findings indicate that Dahl S rats treated with STZ develop progressive renal injury and could be used as a model of diabetic nephropathy.
Acknowledgements**:** Jan Michael Williams, Ph.D.; Adrienne Wells; Richard Roman, Ph.D.; Mallikarjuna R. Pabbidi, Ph.D.; Sydney Murphy, Ph.D.; Fan Fan, M.D.; Marilyn Burke; Jin Zhang; and Robin Dycee Y; Supported in part by an award from the Howard Hughes Medical Institute (Base Pair Program)

P6.06
POTENTIAL ROLE OF CYTOCHROME P450S AS BRAIN TUMOR MOLECULAR TARGETS

Britany Cavett, Eddie Perkins, Rodney Baker, and Stanley Smith,
University of Mississippi Medical Center

The cytochrome P450s are a superfamily of hemeproteins involved in many cellular processes. They play an important role in our ability to metabolize drugs and other xenobiotics. The levels and activity of specific P450 isoforms in different tissues can determine the success or failure of drug therapy regimens. They primarily inactivate drugs and/or make them more water soluble thus terminating the drug's effect. The goal of our investigation was to determine whether cytochrome P450s involved in drug metabolism are differentially present in brain tumor samples as compared to control brain samples. We used glioblastoma multiforme and meningioma tumors as sample sources. Gliablastoma multiforme tumors are highly invasive and fast-growing which makes them difficult to remove and treat effectively with chemotherapeutic agents. Meningioma tumors, however, are slower growing, benign tumors that originate in the meninges of the brain and are mainly treated through surgical intervention. SDS-PAGE and western blotting using isoform specific monoclonal antibodies were used to identify cytochrome P450s present in the tissues. Our blotting results indicated that of the major P450s involved in drug metabolism, only P450 3A4 was present in detectable amounts. Other major P450s (P450 1A1 and P450 2D6) were not detectable. Future studies to clarify these results will involve proteomics experiments using liquid chromatography/mass spectrometry of trypsinized brain control and brain tumor samples. This will allow us to more precisely identify and quantify unique peptides corresponding to P450 3A4. (Supported in part by an award from the Howard Hughes Medical Institute (Base Pair Program)

P6.07
DIFFERENTIAL EXPOSURE TO PRE- AND POST-NATAL NUTRITION PROGRAMS ALTERED GLUCOSE METABOLISM IN GROWTH RESTRICTED OFFSPRING

Jessica Wiseman[2], Jeremy M Johnson[1], F Lee Tull[1], John Henry Dasinger[1], Norma B Ojeda[1], Christine Maric[1], Barbara T Alexander[1]
[1]University of Mississippi Medical Center, [2]Belhaven University, Jackson

Slow growth before birth followed by accelerated growth in early postnatal life is associated with an increased risk for insulin resistance, visceral obesity, and glucose intolerance. The aim of this study was to determine whether a mismatch of pre- and post-natal nutrition programs sex and age dependent differences in factors related to the metabolic syndrome. Intrauterine growth restriction (IUGR) was induced via gestational under-nutrition due to placental insufficiency (PI). PI was initiated at

day 14 of gestation in the rat, and Control and PI dams were maintained on regular rodent chow (RC) or switched to a commercial high fat/ high sucrose diet (HF/HS) at delivery. Pups were maintained on their respective diets after weaning. A mis-match of pre- and postnatal diet led to accelerated growth in IUGR pups resulting in catch-up growth in male and female IUGR on HF/HS. Postnatal exposure to HF/HS led to variability in glucose homeostasis regardless of pre-natal nutrition, control or PI. Moreover, glucose tolerance was impaired in female IUGR offspring on HF/HS at 13 weeks of age; yet by 16 weeks of age only male control offspring on HF/HS demonstrated a significant impairment in glucose tolerance. Thus, age- and sex-specific differences in growth and glucose metabolism result in response to a mismatch of pre-and post-natal growth. Supported by NIH/NHLB074927

P6.08

IN VITRO STUDY OF THE IMPACT OF TRAUMA PATIENT PLASMA ON THE GROWTH OF KIDNEY CELLS.

Benita Williams[1], John DePaula[2], Michael Michel[2], Paul Redmond[2], Xinchun Zhou[2], Olga McDaniel[2]
[1]Murrah High School, [2]University of Mississippi Medical Center

Many traumatically injured patients have demonstrated varying degrees of systemic inflammatory response syndrome (SIRS), leading to clinical complications including sepsis and organ failure. Thus, plasma from such patients must constitute inflammatory cytokines that might affect on functional activities of the organs. Thus, we hypothesized that plasma from patients with trauma/injury differently affects cell proliferation at different time intervals after the insult. Blood was drawn at <24, <48 and 72 hours after admission, from trauma patients and plasma was immediately separated and stored at -20^{o}C. Primary cell cultures from the cortex and medulla of human kidney was generated in a 6 well culture plate using RPMI 1640 medium with supplements. Monolayer cultures were transferred into 24 well culture plates to be tested with patient's plasma samples. Morphologic examination of the cells before and after plasma treatment demonstrated variation in cell shape and growth rates. Patients who developed sepsis had demonstrated increases in plasma levels of all cytokines (IL-6, IL-10 and IL-18 $p<0.005$). TNF-α was increased only between first 24-48 hours after trauma ($p<0.05$). There was a 50% and 70% reduction in cell numbers comparing treatment with 24 hr plasma vs. 48 hr vs. 72 hr. No significant change in cell numbers was observed with plasma from patients with no sepsis. The results indicated that plasma from trauma patients significantly affected and reduced the growth of primary cell cultures from the kidney. (This study was supported in part by an award from Howard Hughes Institute, *Base Pair Program*).

P6.10

ASSESSING SCHOOL LUNCHES AS A MEDIATING FACTOR IN CHILDHOOD OBESITY

Lauren Vucovich, Orla Kirk, A. Kurt Thaw
Millsaps College

Childhood obesity is increasing at an alarming rate, with many factors contributing to significant weight gain. Some of these factors may be counter-intuitive. For example, many school allot very small time slots for the lunch period. A shorter lunch period may actually increase caloric intake and unhealthy eating habits by reducing the time for postingestive physiological signals (satiety factors) to curtail eating, and by encouraging the selection of high calorie, non-nutritious foods to efficiently sate hunger. Furthermore, if students required to eat in shorter periods in school form habits that carry over outside of school, then these lunch schedules may in fact have a long-term, negative impact. Thus we propose that a relationship may exist between the time allotted for school lunches and obesity rates / poor eating behaviors. We studied these relationships in a high-obesity (Mississippi) and medium-obesity (Florida) state to determine if this effect is independent of cultural eating norms. Weight, height, waist circumference, and percentage of body fat were measured on elementary school students as well as high school juniors and seniors. Results confirm the hypothesized relationship between the length of school lunches and obesity rates of high school students. Further work in this area is warranted as a simple way to possibly reduce the incidence of childhood obesity.

P6.11
EFFECTS OF SUSTAINED DELIVERY OF EPIGALLOCATECHIN-3-GALLATE (EGCG), SELENIUM (SEL), AND THYMOQUINONE (TQ) ON ES-2 CELLS

Felisa Wilson-Simpson, LaToya Richards, Hamed Benghuzzi
University of Mississippi

According to statistics from the Centers for Disease Control and Prevention, ovarian cancer is responsible for more deaths than any other gynecological cancer in the United States (2009). Antioxidants play a vital role in protecting cells from damage caused by unstable free radicals implicated in cancer development. Although, many subsequent studies have been done on antioxidants and cancer, studies are limited assessing the relationship with ovarian cancer. Ceramic drug delivery systems offer alternate routes of drug delivery which allows sustained levels of drugs to be administered for extended time periods without side effects. Studies have suggested that tea and soybeans have bioactive components with anticarcinogenic properties (BINN et al., 2004 and Spinella et al. 2006). The aim of this study was to utilize the tricalcium phosphate (TCP) drug delivery system to evaluate the response of the ES-2 ovarian cells to treatment with epigallocatechin-3-gallate (EGCG), selenium (SEL), and thymoquinone (TQ) following 24, 48, and 72 hour incubations. All groups were evaluated and biochemical analysis, total protein, malinodialdehyde (MDA), and glutathione assays were performed. Results revealed that administration of the micronutrients to the ES-2 cells affected the biochemical machinery and assays via specific signaling pathways, which remain unclear. This data demonstrated disruption to ES-2 cells and sustained delivery induced suppression for a longer duration. Overall, results of this study indicated that antioxidant treatment with ceramic drug delivery devices may cause physiological responses in ES-2 cancer cells. These findings may offer tremendous benefits and provide effective treatment for ovarian cancer patients.

P6.12
THE EFFECTS OF THYMOQUINONE AND GREEN TEA EXTRACT ON WI-38 FIBROBLASTS EXPOSED TO LOW-DENSITY LIPOPROTEIN

Felicia M Tardy, Hamed Benghuzzi, Michelle Tucci
University of Mississippi Medical Center

Previous research in cardiovascular disease (CVD) has indicated that differences exist among men and women. These differences are partially attributed to sex hormones, especially testosterone and estrogen. As CVD remains the leading cause of death for both men and women in the US and as healthcare costs continue to rise, researchers are seeking alternative methods of treating the disease. Consequently, the use of antioxidants for treatment of CVD has gained much attention in recent years. The specific aim of this study is to investigate the effects of the potential antioxidants thymoquinone and green tea extract on WI-38 (female) fibroblasts exposed to low-density lipoprotein (LDL). WI-38 fibroblasts were incubated with LDL in the presence of thymoquinone and/or green tea extract and were evaluated for signs of cellular damage. Results of this study suggest that thymoquinone and green tea extract may delay the progression of cellular damage caused by LDL challenge.

P6.13
EFFECTS OF CITALOPRAM ON 5-HT1A AUTORECEPTOR EXPRESSION IN NEUROBLASTOMA CELLS: CAN EPIGENETICS EXPLAIN THE CHANGES OBSERVED?

Naila Mamoon[2], Dominique Benson[1]
[1]University of Mississippi Medical Center, Jackson, MS, United States, [2]Millsaps College, Jackson, Ms, United States

5-HT1A receptors mediate inhibitory effects in serotonergic pathways. Binding of serotonin to 5-HT1A autoreceptors located on serotonergic neurons, produces an inhibitory effect decreasing neuronal firing rate and serotonin release. Citalopram, a selective serotonin reuptake inhibitor (SSRI), is used to treat depression. Acutely, citalopram blocks serotonin reuptake causing an increase in serotonin level at the synapse resulting in an enhancement of serotonergic neurotransmission. However, after three weeks of treatment, amelioration of symptoms of depression is observed which correlates with a reduction in serotonin 5-HT1A autoreceptors, disinhibition of the serotonergic neurons and enhancement of neuronal firing rate and serotonin release. The two to three week latency for efficacy of antidepressant therapy suggests that long-term changes are required in the serotonin pathway before beneficial effects can be seen. Herein, we hypothesize that the reduction in expression of 5-

HT1A autoreceptors during citalopram treatment occurs due to an increase in the extent of methylation of the promoter sequences of the *5HT-1A* autoreceptor gene. Using citalopram treated neuroblastoma cells as an experimental system, we will utilize real time polymerase chain reaction based DNA methylation assays to study the extent of methylation of the *5-HT1A* autoreceptor gene. The data obtained will be correlated with mRNA and protein expression levels of 5-HT1A autoreceptors. The data is expected to shed light on whether epigenetic changes in serotonergic genes may partially explain SSRI efficacy observed in individuals who are being treated for major depressive illness.

Supported in part by an award from the Howard Hughes Medical Institute (Base Pair Program).

P6.14

CORRELEATION OF OBESITY AND PROSTATE CANCER

Kristi Hardwick, Andrea Tener**,** Michelle Tucci, Zelma Cason, and Hamed Benghuzzi
University of Mississippi Medical Center, Jackson, MS 39216

In the United States, prostate cancer is the second leading cause of cancer-related deaths among males. Prostate cancer has an incidence of approximately 1 in every 10 men. Early detection of prostate cancer has been hindered by the lack of symptoms in men with localized tumors. Nearly half of men under 70 years old have microscopic prostate tumors. Although prostate cancer mortality is decreasing in industrialized countries, it has been argued that obesity is linked an to increased risk prostate, colorectal, esophageal, and renal cancer in men. The goal of this study was to compare the incidence and mortality of prostate cancer in Colorado and Oregon (Lean states) and Alabama, Mississippi, Arkansas (Obese states). Data collected and analyzed showed greater than a 3.5% decline in mortality from prostate cancer. The incidence of prostate cancer was had the largest increase in Alabama (>3.0%) compared with Colorado (0.5%). Further analysis of data collected from Alabama showed a lower incidence of prostate in Black males (1.9%) compared with White males (3.0%); however, the mortality rates were similar. Incidence of prostate cancer also decline in Blacks by 8.4% in Oregon compared to a 1.4% decline in Whites. In Oregon, the mortality rate among Blacks showed the largest decline by 31.4% compared with a 3.4% decline in Whites. Overall, the data does not suggest a trend in the obese states as having a higher incidence or mortality rate than lean states.

P6.15

THE EFFECTS OF CYCLOSPORINE A AND ESTROGEN ON GINGIVAL FIBROBLAST

Jacqueline Keys, Nicholas Funchess, Michelle Tucci, Zelma Cason, and Hamed Benghuzzi
University of Mississippi Medical Center, Jackson, MS 39216

Hormones are specific regulatory molecules that can induce physiologic and pathologic changes in almost all tissues of the body with the gingival being no exception. Physiologic changes like puberty, the menstrual cycle, and pregnancy cause hormonal variations may cause changes within the gingiva. Oral contraceptives that contain estrogen and/or progesterone are associated with gingival enlargement. In addition to estrogen, drugs such as Cyclosporine A (CsA), a widely used immunosuppressant, are associated with the development of gingival overgrowth. The mechanism of action that leads to gingival overgrowth is unclear. The objective of this study was to determine the overall cytology of the gingival cells after treatment with estrogen, cyclosporine and combination of estrogen and cyclosporine. Cell morphology and cellular apoptosis were evaluated after 24 and 48 hours of culture. Cellular response to supra-physiological levels of estrogen (1 ng/mL) after 24 and 48 hours were similar to control untreated cells. Similar percentages of cellular apoptosis were seen in control and estrogen treated cells after 24 and 48 hours of treatment. Gingival fibroblast treated with cyclosporine A showed increase vaculolization and frothy cytoplasm compared to control. Estrogen treatment caused an increase in cell clumping resulting in an increase in the number of cells per view. Combination of cyclosporine and estrogen showed the most dramatic changes in the cell morphology with the vast majority of cells being anucleated and higher incidence of apoptotic cells. More research is needed to determine the mechanism of action leading to gingival overgrowth and caution should be taken when prescribing drugs with similar side effects.

P6.16
THE EFFECTS OF SUSTAINED DELIVERY OF HERCEPTIN ON KIDNEY AND SALIVARY GLANDS

James Booth[1], Porsha Newell[1], Soaad Ibrahim[1], Michelle Tucci[2], Joseph A. Cameron[1], and Hamed Benghuzzi[2].
[1]REAP Program, Jackson State University, Jackson, MS and [2]University of Mississippi Medical Center, Jackson, MS 39216

HERCEPTIN® (Trastuzumab) as a single agent is indicated for the treatment of patients with metastatic breast cancer whose tumors overexpress the HER2 protein and who have received one or more chemotherapy regimens for their metastatic disease. The recommended initial loading dose is 4 mg/kg Trastuzumab administered as a 90-minute infusion, and the recommended weekly maintenance dose is 2 mg/kg by infusion. The problem with this conventional delivery of herceptin in the serious side effects which include increased blood pressure, dry mouth, cardiac dysfunction and cardiomyopathy. The objective of our research was to continuously deliver 2 ug/day anti-her2 neu via a tricalcium delivery device in Sprague Dawley rats for 8 weeks and evaluate the heart tissue, salivary gland and kidney at necropsy. To date we found trace amounts of her2 –neu antibody within the kidney and salivary gland; however, the structure of the glands was not disrupted by the treatment. We currently are evaluating the heart tissue. The use of sustained delivery of 2 ug/day her2 neu antibody to Sprague Dawley rats appears to be effective in reaching the tissue, and may potentially be an effective route of administration to avoid associated side effects.

P6.17
CORRELATING BLOOD TYPE WITH INFECTION

Paul Vickery, Charles McIntire, Stacy Vance and Hamed Benghuzzi
University of Mississippi Medical Center, Jackson, MS 39216

There are several debates and studies in the scientific community on whether ABO blood types affect certain aspects of our health. According to the Journal of Medical Virology, (September, 2007), studies have shown that certain blood groups are more susceptible to Norovirus (NoV) infection. Since 1970, group B strep infection has become the leading bacterial infection causing illness and death in newborns in the United States. Currently the number of adult infections nearly doubled during the 1980s and continues to rise. Enterococci are part of the normal intestinal flora of humans and animals but are also important pathogens responsible for serious infections. With increasing antibiotic resistance, enterococci are recognized as feared nosocomial pathogens that can be challenging to treat. The objective of our study was to determine if certain ABO blood groups are more susceptible/resistant to bacterial infection. Results from our study indicate Our data indicate (1) Group O blood type contained fewer colonies of Enterococcus after 1 day and 7 days of incubation. (2) The A blood group contained a higher colony count than the other blood groups when treated with Streptococcus after 1 day and 7 days of incubation. (3) Blood type susceptibility did not show significant differences in the rate of growth or colony count in the AB, A, or B groups treated with Enterococcus. The results from our data indicated that there are apparent differences in susceptibility levels to infections caused by gram positive bacteria among different blood types.

P6.19
THE EFFECTS OF CYCLOSPORINE AND ESTROGEN ON GINGIVAL FIBROBLAST VIABILITY AND FUNCTION

Tammy Stockton, Christen Babb, Stacy Vance, and Ham Benghuzzi
University of Mississippi Medical Center, Jackson, MS 39216

P6.19
THE EFFECTS OF GENISTEIN ON PROSTATE CANCER CELLS

Ricardo Carson, Shameka Berry, Stacy Vance, and Ham Benghuzzi
University of Mississippi Medical Center, Jackson, MS 39216

P6.20
CHEMOPREVENTIVE EFFECTS OF GREEN TEA ON ANDROGEN POSITIVE PROSTATE SPECIFIC ANTIGEN

Jessica Gray, Kimberly Baker, Stacy Vance, and Ham Benghuzzi
University of Mississippi Medical Center, Jackson, MS 39216

P6.21
EFFECTS OF ESTROGEN ON CLOTTING

FACTORS

Lameka Berry, Katherine Beck, Stacy Vance, and Ham Benghuzzi
University of Mississippi Medical Center, Jackson, MS 39216

P6.22
THE EFFECTS OF EGCG ON THROMBIN MEDIATED PLATELET ACTIVATION

Theresa Buck, Stephanie Swint, Stacy Vance, and Ham Benghuzzi
University of Mississippi Medical Center, Jackson, MS 39216

P6.23
THE EFFECTS OF THYMOQUINONE ON THROMBIN MEDIATED PLATELET ACTIVATION

Dorris Jeffery, Natalie Small, Stacy Vance, and Ham Benghuzzi
University of Mississippi Medical Center, Jackson, MS 39216

P6.24
EVALUATION OF KIDNEY FUNCTION TESTS FOLLOWING ACHILLES TENDON REPAIR

JoAnna Collins, Shawn Smith, Stacy Vance, and Ham Benghuzzi
University of Mississippi Medical Center, Jackson, MS 39216

Poster Session II—6:00-7:00 PM (Following Dodgen Lecure)

P6.25
TRACKING FOODBORNE PATHOGENS FROM THE GROUND TO THE DINNER PLATE

Erwin W. Morales[1], Barakat S. M. Mahmoud[2]
[1]Cooperative Intern Program between the Mississippi Gulf Coast Community College – Jackson County Campus Honors Biology Students, [2]the Mississippi Department of Marine Resources, [3]the National Aeronautics and Space Administration, Stennis Space Center, [4]the Institute for Marine Mammal Studies

P6.26
PATIENT SATISFACTION

Katie Day[1], Nia Nix[1], Maggie Clarkson[2]
[1]Cooperative Intern Program between the Mississippi Gulf Coast Community College – Jackson County Campus Honors Biology Students, [2]the Singing River Hospital System, [3]the National Aeronautic and Space Administration, Stennis Space Center, [4]the Institute for Marine Mammal Studies

P6.27
EVALUATION OF SERVICES USED COMPARING MULTIPLE FACTORS

Deanna Fasbender[1], Nia Nix[1], Margarite Clarkson[2]
[1]Cooperative Intern Program between the Mississippi Gulf Coast Community College – Jackson County Campus Honors Biology Students, [2]the Regional Cancer Center of the Singing River Hospital System, [3]the National Aeronautics and Space Administration, Stennis Space Center, [4]the Institute for Marine Mammal Studies

P6.28
GLUCOMETER WOES AND TRAINING CODES

Ryan Lake[1], Dillon Seymour[1], Deidre Peyton[2]
[1]Cooperative Intern Program between the Mississippi Gulf Coast Community College-Jackson County Campus Honors Biology Students, [2]the Singing River Hospital System, [3]the National Aeronautic and Space Administration, Stennis Space Center, [4]the Institute for Marine Mammal Studies

P6.29
CELLULAR EFFECTS OF CATABOLIC INFLAMMATORY CYTOKINES ON CHONDROCYTES

Tracye Lawyer, Michelle Tucci, Hamed Benghuzzi
University of Mississippi Medical Center

The inhibitory effects of the pro-inflammatory cytokines interleukin 1β, tumor necrosis factor-α, and interleukin-6 on articular chondrocyte growth dynamics are well recognized. Previous studies have shown that IL-1β and TNFα inhibit chondrocyte differentiation and induce cell death. IL-1β and TNFα appear to play important roles in affecting chondrocyte function. Numerous studies have shown that IL-1β stimulates chondrocytes to increase production of matrix metalloproteinases (MMP's) and other degradative products. IL-1β is

extremely important to cartilage destruction, while TNFα appears to drive the inflammatory process. IL-6 has also been proposed as a contributor to the osteoarthritis pathological process by increasing the number of inflammatory cells in synovial tissue, stimulating the proliferation of chondrocytes, and inducing an amplification of the IL-1 effects on the increased synthesis of metalloproteinases and inhibiting proteoglycan production. Our objective was to evaluate matrix degradation markers, apoptosis, cellular damage markers, and cellular morphology of chondrocytes following a challenge with inflammatory cytokines. Chondrocytes were plated at a density of 8 x 10^4 cells/mL onto three 24 well plates to serve as 24, 48, and 72 hour groups. Chondrocytes were treated with IL-1β, TNFα, and IL-6. After 24, 48, and 72 hours of culture, cells were harvested for viability, cellular function, cellular damage, and cellular morphology. Our preliminary findings demonstrated a decrease in chondrocyte viability, altered cellular morphology due to cellular damage, and an increase in both MMP-13 and cellular apoptosis with treatment of IL-1β and TNFα, but more substantial differences with IL-1β.

P6.30

PHOSPHOLIPID PROFILE OF THE MACROPHAGE CELLULAR MEMBRANE IN RESPONSE TO CHALLENGES WITH ETHANOL AND TOXIN

LaKeysha Rose[1], Hamed Benghuzzi[1], Michelle Tucci[1]
[1]Mississippi College, [2]University of Mississippi Medical Center

Macrophage cells mount a protective inflammatory cascade in response to cell injury. Agents such as LPS and cytokines bind to different receptors on the macrophage cell membrane, triggering activation of phospholipase and subsequent cellular signaling. There have been numerous studies that suggest that an effect by ethanol use on cytokine production is consistent with a broad range of immune defects contributed to ethanol use. It's unclear if the ethanol regulates cytokine production via activation or stimulation of single or multiple receptors. Ethanol is thought to inhibit phopholipase D and inhibit the production of phosphatidic acid (PA) which has been shown to be a signaling component for inflammatory cytokines. The purpose of this experiment was to evaluate the cellular phospholipid membrane profile of RAW macrophage cells in the presences of LPS and ethanol at various times (60min, 2hrs, 4hrs) either alone or in combination. Macrophage like cells (RAW) were treated in triplicate with media, LPS, 40 mM ethanol, or LPS for 30 minutes followed by ethanol, or ethanol for 30 minutes followed by LPS and each experimental phase was repeated 3 times. Following the incubation periods, the cellular phospholipids were extracted and characterized by thin layer chromatography. LPS increased PA in RAW cells; whereas, ethanol inhibited PA. In addition, the LPS + ETOH lipid profile differs from ETOH + LPS profile indicating the timing of ethanol addition is important for disruption of PA. More experiments are necessary to address the effects of PA on inflammatory cytokine production by macrophage cell types.

P6.31

ROLE OF PLANT-DERIVED ANTIOXIDANTS ON NF-κB EXPRESSION IN LPS-STIMULATED MACROPHAGES

Renee Wilkins, Michelle Tucci, Hamed Benghuzzi
University of Mississippi Medical Center

The use of antioxidants has been shown to be beneficial in stimulating immune cells to increase phagocytosis and up-regulating the cellular processes to limit inflammation. Investigations into the specific mechanisms involved in the regulation of the inflammatory response in macrophages are broad; however, many researchers have found that regulating NF-κB may be a key component. The goal of this study was to assess the antioxidant potential of epigallocatechin-3-gallate (10μM) and thymoquinone (10μM) on RAW 264.7 macrophages before and after being stimulated with LPS (0.01 μg/mL). Our results showed that both EGCG and TQ, given individually, decreased NF-κB translocation in the nucleus when given before and after LPS stimulation. EGCG appeared to have the most impact on NF-κB in cells stimulated with LPS, but TQ was not as effective in inhibiting NF-κB in comparison to EGCG. The combination of EGCG and TQ showed a much higher level of NF-κB translocation compared to individual treatment, suggesting individual treatment may be more effective. In conclusion, we believe that EGCG and TQ may possibly block the upstream activation of MAPK or inhibit the activity of the MAPK pathway, but further investigations are needed to understand the exact mechanisms of these observations.

P6.32
COMPARISON OF pH VALUES FOR EXTRACTION OF Δ-9 TETRAHYDROCANNABINOL FROM URINE

Ashlym Harmon, Thomas Pittman
University of Southern Mississippi

Efficient methods to extract and detect Δ-9-THC in urine samples and relate the concentrations found to time are a necessity so impairment may be determined from urine samples. In past research, either a strong alkaline solution or b-glucuronidase has been used to cleave the bond between the Δ-9-THC and glucuronic acid before an alkaline extraction. Δ-9-THC has a pKa of 10.6 and has always been extracted at an alkaline pH. In this study, both a strong solution of NaOH and the enzyme were used to break the glucuronide bond in urine samples and concentrations obtained from each sample compared. This research project looked at the best means to cleave the glucuronide bond and determined if an extraction could be performed at an acidic pH and still yield expected results. NaOH proved unacceptable for cleaving the bond, thus all samples were treated with b-glucuronidase at a pH of 6.5 and then 50 of the samples made alkaline prior to extraction. For the two extractions using b-glucuronidase, $t_{(.05)\ (100)} = 0.283$ for the height and $t_{(.05)\ (100)} = 0.277$ for the area. The two extractions proved not to be significantly different. The t ratio for the concentrations was calculated and again determined to not be significantly different; $t_{(05)\ (100)} = 0.241$ which fell well below the acceptable value of significance.

P6.33
GESTATIONAL HYPERTENSIVE DISORDERS AND ADVERSE BIRTH OUTCOMES: FINDINGS FROM THE 2008 MISSISSIPPI PREGNANCY RISK ASSESSMENT MONITORING SYSTEM (PRAMS)

Mary Wesley, MPH[1], Kristin Black, MPH candidate[2], Connie Bish, PhD, MPH[1], Lei Zhang, PhD, MS, MBA[1], Juanita Graham, RN, MSN[1]
[1]Mississippi State Department of Health, Office of Health Data and Research, [2]University of North Carolina at Chapel Hill, Gillings School of Global Public Health, Department of Maternal and Child Health

Five to eight percent of U.S. birth complications are due to gestational hypertensive disorders. The objective of this study was to examine self-reported gestational hypertensive disorder among Mississippi women and associations with low birthweight (LBW; <2500g) or preterm births (PTB; < 37 weeks gestation) after controlling for maternal factors. This has not been investigated utilizing Mississippi PRAMS data. The survey included 1,447 respondents. Inclusion criteria included all responses to the question of "high blood pressure, hypertension (including pregnancy-induced hypertension), pre-eclampsia, or toxemia" during pregnancy. The exposure of interest was self-reported gestational hypertensive disorder. Other maternal exposure variables included: race, age, education, marital status, smoking during pregnancy, and body mass index. Outcomes investigated were LBW and PTB. Chi-square analyses and logistic regression were run using SUDAAN 10.0. The 2008 survey response rate was 68%. Mothers with gestational hypertensive disorder had significantly higher LBW deliveries compared to normotensive mothers (26.1% vs. 9.6%; $p < 0.0001$). Mothers with gestational hypertensive disorder had significantly higher PTB compared to normotensive mothers (27.3% vs. 11.9%; $p = 0.0003$). After controlling for maternal confounders, gestational hypertensive disorder was significantly associated with PTB ($p=0.0167$), but not with LBW ($p= 0.2105$). Mississippi women self-reporting gestational hypertensive disorder were nearly four times as likely to have a PTB compared to those who did not report the condition (OR=3.97, 95% CI 1.28-12.27). Our study suggests hypertensive women should be considered high risk given the association with PTB, and should receive high risk prenatal care.

P6.34
AUTOIMMUNE HEPATITIS: A CASE STUDY AND REVIEW

Gloria Flamenco, A. Swann, Margot Hall
University of Southern Mississippi

Autoimmune hepatitis is a chronic form of liver inflammation. It is a very rare autoimmune disorder in which the body attacks the liver. Autoimmune hepatitis (AIH), which is sometimes called lupoid hepatitis, is not well understood because of the fact that it affects each patient differently. The liver becomes inflamed due to a cell-mediated attack in which T-Lymphocytes produce autoantibodies directed against liver antigens. This paper introduces a patient who has lived with AIH for almost a decade and whose therapeutic regiment may serve as a model for the disorder. An interview was conducted with a twenty eight year old, female patient who has autoimmune

hepatitis, Type I. A timeline of her diagnosis is discussed, and her laboratory results are analyzed. Currently, this patient is living a fairly normal life despite her circumstances. Her last liver function tests were completely normal which is unusual with such a disorder. The patient is taking an immunosuppressive drug to treat her autoimmune disorder. She is also following a Vegan diet with unrefined sugar, and she gets regular sleep and exercise. With good results on her liver function tests, over the next few months, she may be able to withdraw the immunosuppressive drug totally due to her incredible health improvement.

P6.35
A SYSTEMATIC REVIEW OF TIME FRAMES FOR RECOVERY: AMBULATION WITH COMPRESSION VERSUS BED REST IN THE EVEN T OF A DEEP VEIN THROMBOSIS

Paula Stubbs, PT, PhD, Rachel Iupe, Chris Britt, Nicholas Cagle, Ben Edwards, Samantha Green, and Matthew Woodruff. Department of Physical Therapy, University of Mississippi Medical Center, Jackson, MS

Deep vein thrombosis (DVT) is a common life-threatening complication because they can dislodge and become pulmonary embolisms; therefore it is important to know when it is safe to begin ambulation as a physical therapy intervention. The purpose of this review was to define a safe time period to initiate ambulation of patients once diagnosed with an acute DVT. A search was conducted using OvidMedline. The dates were limited to 2000-2010. Search terms for DVT and terms related to ambulation were utilized. Electronic limitations included randomized control trial, humans, and English language. Acute DVT and antithrombolytic treatment were used as inclusion criteria. Studies were assessed using PEDro and CEBM scales. Four studies out of 43 studies met the inclusion criteria. The average PEDro score for the 4 studies was 5.5/10. The range of PEDro scores was 4/10-8/10. The CEBM levels were assigned and included a level I and 3 level II studies. In conclusion, after antithrombolytics are administered it is safe to begin ambulation after a DVT. In all four of our research articles, ambulation was preferred over bed rest for safety reasons to prevent a pulmonary embolism (PE). In 2 of the 4 articles, compression was also used with ambulation as a safe outcome. However, compression with ambulation was not compared to compression without ambulation. Clinically this treatment needs to be based on the individual patient. When trying to prevent a possible pulmonary embolism, it is better for the patient to be mobile rather than immobile.

P6.36
REVIEW OF THE EFFECTS OF LOW-LEVEL INFRARED LASER THERAPY ON ACUTE ISCHEMIC STROKES

Min Huang*, Neva F. Greenwald, Bethany Barker, Courtney Britt, Noland Bullen, Edwin Montgomery, Rob Simpson, Sarah Spengler Compton, Department of Physical Therapy, School of Health Related Professions, University of Mississippi Medical Center, Jackson, MS 39216

Purpose: Animal models have demonstrated the effectiveness of low level laser therapy on induced ischemic models in both rats and rabbits, resulting in positive benefits without significant risks. The purpose of this review is to determine a non-invasive alternative method to the treatment of acute ischemic stroke using low level infrared laser therapy in humans.
Methods: The database used for the systematic review was PubMed, with publication dates of 2000-2010. General search terms used were low level laser therapy and acute ischemic stroke. Specific search strategy will be specified later. Electronic limits included humans, randomized controlled trial and English language. Specifice inclusion criteria were ischemic stroke, non-invasive low level laser therapy with wavelength of 808 nm. Exclusion criteria included previous history of stroke. To determine internal validity of the studies, the PEDro scale was used, which measures internal validity and interpretability in a 10 point scoring system. The CEBM scale was used to assign the levels of evidence as determined by the Oxford Centre for Evidence-Based Medicine, which determines the level of study design.
Results: All research studies included in the review met the screening criteria. Both studies presented with a Pedro Score of 10 and a CEBM Level I.
Conclusion: Similar to previous animal models, these studies demonstrated significant improvements in neurological functioning scores following the treatment of laser therapy towards acute ischemic stroke. The overall literature was given a grade of A secondary to its efforts to reduce bias regarding internal validity. With continued positive results in future studies, laser therapy may become a recommended intervention for acute ischemic strokes.

P6.37
A SYSTEMATIC REVIEW OF THE EFFECTIVENESS OF LOW LEVEL LASER THERAPY IN REDUCING PAIN IN CHRONIC LATERAL EPICONDYLITIS

Adah F., Brook M., Crowson M., Harmon K., Herrington H., Price J., and Ryals A. Department of Physical Therapy University of Mississippi Medical Center Jackson, MS 39216

Background and Significance: Chronic epicondylitis is a common musculoskeletal inflammatory condition with a current variety of treatment options. Research studies have shown that low level laser therapy can reduce pain and inflammation, as well as promote healing. The purpose of this review is to examine the efficacy of low level laser therapy in the management of chronic lateral epicondylitis.
Methods: Ovid (Medline) 1996 – March 1, 2010 was searched for studies meeting our specified criteria. Search terms included various forms of lateral epicondylitis combined with various forms of low level laser therapy. Inclusion criteria included diagnosis of lateral epicondylitis, randomized controlled trial, and laser wavelength between 600-1064, presence of symptoms for over 6 months, and minimum age of 16 years at the start of study. Internal validity of the studies used in this review was measured using the PEDro scale, which is scored on a 10 point scale. The level of evidence was rated using the Oxford Centre of Evidence-Based Medicine (CEBM), which is a scale that measures control of bias based on study design.
Results: Four of the ten studies identified by the search strategy met all specified criteria. The average PEDro score was 6/10. These four studies had ranges of PEDro scores from 7/10 to 4/10. Based on CEBM, three of the studies were level I, and one was level II.
Conclusions: The majority of these studies reported reduction of symptoms relating to lateral epicondylitis but not statistically different when laser therapy to other modalities or treatments are compared. Laser can be applied during acute, subacute and chronic conditions; it is therefore recommended that laser modality be added to the therapeutic arsenals for the treatment of lateral epicondylitis. We recommend further studies especially to elucidate the mechanism of action of laser.

P6.38
NOTCH ACTIVITY AND DIETARY PHYTOESTROGENS

Zohreh Sirous, Xiaomei Zhu, Larry Walker, Antonio Pannuti, Lucio Miele

Introduction: the majority of breast cancers are estrogen dependent. For this reason the effect of dietary components with estrogenic activity on incidence, progression and therapy outcome constitute an interesting area of research in breast cancer. Phytoestrogens are a subcategory of compounds called flavonoids, a group composed of hundreds or more types of molecules and have estrogenic effects in animals. Epidemiological studies in Asia have shown a low prevalence of hormone-dependent cancers of the breast, endometrium, and prostate in populations with high dietary content of soy products. In our lab we study the notch signaling pathway, which affects cell proliferation, differentiation, motility and survival and it has been shown to be activated in breast cancer.
Objective: In our study, we investigated whether there is any cross talk between Notch and different phytoestrogens in breast cancer cells.
Methods: MCF-7 cells from ATCC were grown in RPMI with 10% fetal bovine serum and 6 ng/ml insulin and treated with three different phytoestrogens (Kaempferol, Genistein and Resveratrol) for 24 hours. To Measure the Estrogen receptor activity, cells were transfected at 80% confluency in complete medium with ERE-Luciferase and pTK-renilla plasmids using the Lipofectamine LTX reagent (Invitrogen). Notch activity, were measured with a trasnfection with the Hes1-Luciferase and pTK-renilla plasmids.
Results: the results of our study showed that all compounds had estrogenic activity at concentration equal or higher than that of 1 nM estradiol. Among these compounds, Kaempferol inhibited Notch to the same extent as estradiol. Conversely, Genistein was less potent as a Notch inhibitor, even though at the concentration tested it was a far more potent estrogen than either Kaempferol or 1 nM estradiol. Resveratrol, which also was a more potent estrogen than Kaempferol, had no significant effect on Notch activity at this concentration.
Conclusion: Different phytoestrogens affect Notch activity differently, and that there is no simple correlation between their estrogenic potency in a reporter assay and their Notch-inhibitory activity.

P6.39
The Use of ^{90}Yttrium Microspheres in the Treatment of Hepatocellular Carcinoma and Metastatic Liver Cancer

Walter David Smith*MS,, M2 Theron Scott Williams MS, M2 Bhavika Dave M.D.
University of Mississippi Medical Center Jackson, MS 39216

Background SIR-Spheres microspheres are extremely small beads that are preloaded with yttrium-90, a beta particle emitting radioactive substance. Yttrium-90 has a half life of roughly 64.1 hours. This means every 2.5 days the amount of radiation is decreased by half. ^{90}Yttrium Microspheres has been FDA approved for metastatic colorectal cancer. Therapy goals are local disease control, downstaging to resection, bridging to transplantation, and extended survival. SIR-spheres are injected into the arteries leading to the cancer, becoming lodged in the capillary bed. After 14 days, the spheres have completed the majority of the radiation's effect. SIR-Spheres are considered a regional treatment, only having effects near the injection site of the liver and avoiding other tissues.
Results SIR-spheres are showing to be more precise in targeting of the tumor volume than external beam radiation or chemotherapy. Fewer side effects and decreased morbidity are associated with their use. SIR-sphere use leads to decreased dosage of chemotherapy or external beam radiation to regular tissues. Injection of SIR-Spheres is done in the Interventional Radiology Department at U.M.C. while the patient is conscious. Preliminary results indicate that doses above 120 Gy are doing better. Side effects include gastric ulceration due to backflow and pulmonary pneumonitis. Spheres injected tend to only distribute to the periphery of the large liver tumors and fractionated dosing may be necessary to get to the center cells of the larger tumors. SIR-Spheres are well tolerated and require fewer visits to the hospital than chemotherapy techniques alone.
Conclusions The extent to which the SIR-spheres improve the prognosis of metastatic liver cancer is relative to a few variables: Dosing of above 140 Gy, the number and size of the metastatic tumors, and the extent to which the tumors have metastasized to other organs. Preliminary results indicate an increase in survivability of metastatic liver cancer from 5-9 months without treatment to 14-18 months with SIR-Sphere treatment. This prognosis may be slightly increased with adjuvant chemotherapy treatments.

February 18, 2011
Ballroom I

FRIDAY MORNING

8:30 Opening Remarks

O6.06
8:45
MATH FOR NURSES: A SURVEY OF MATHEMATICS IN THE NURSING FIELD

Lauren Willis[1], Joan Hendrix[1]
[1]Cooperative Intern Program between the Mississippi Gulf Coast Community College-Jackson County Honors Biology Students, [2]the National Aeronautics and Space Administration, Stennis Space Center, [3]the Institute for Marine Mammal Studies

O6.07
9:00 THE ROLE OF PHOSPHOLIPASE D PATHWAY IN MACROPHAGE RESPONSE TO ENDOTOXIN

Gerri Wilson, Michelle Tucci, Hamed Benghuzzi
University of Mississippi Medical Center

The phospholipase D pathway has been implicated cellular signaling responses, and can be disrupted by ethanol. We have found that challenging macrophages with ethanol ranging from 10-100 mM altered cellular morphology, decreased cell number, and impaired chemotactic and respiratory functions after 24, 48, and 72 hours. The goal of the present experiment was to determine the effects of ethanol and LPS after shorter time periods, and to determine the response on cellular function and morphology. We also examined whether the timing of alcohol challenge plays a role in the macrophage response to LPS. RAW-264.7 cells were challenged with either 1 μg LPS or with 40 mM ethanol for 30 minutes prior to the addition of 1 μg LPS before cell numbers, morphology, glutathione levels, nitric oxide levels, and MDA concentration were determined after incubation periods of 1, 2, and 4 hours. Our results show no significant differences in cell numbers, cellular damage, or cellular nitric oxide levels for the duration of the study. Significant changes in morphology were visible within 1 hour and became more pronounced with time. Macrophages treated with ethanol showed increased foot processes, and those treated with LPS showed cytoplasmic vacuolization. Intracellular interleukin-

1β concentration was increased over control values in all cells with LPS after 1 hour and continued to rise over 4 hours. Overall, the early macrophage response to ethanol appears to be associated with morphological changes, and it is imperative to investigate the role of the phospholipase D pathway in membrane alterations.

O6.08
9:15 USE OF MONOCLONAL ANTIBODIES CHEMICALLY BOUND TO A POLYSTYRENE SURFACE TO EXTRACT Δ-9-THC and Δ-9-THCd_3 FROM BIOLOGICAL SAMPLES

Thomas Pittman
University of Southern Mississippi

The experiment was to determine if antibodies specific for Δ-9-THC could be chemically bound to a solid surface of polystyrene and extract the specific drug along with an appropriate internal standard (IS) from a biological matrix for analysis by a secondary method. Secondly, could the antibody covered polystyrene be washed to remove any possible interfering substances and continue to bind the analytes of interest within the cell culture flasks. Glutaraldehyde was used to bind monoclonal Δ-9-THC antibodies to the bottom polystyrene surface of a 25 ml Falcon® cell culture flask at pH 5.2. Drug free urine samples (2 ml) were spiked with Δ-9-THC at levels ranging from 0 - 1000 ng/ml in separate flasks over a seven day period and run in the same fashion as an ELISA assay to determine if the antibodies did bind and continued to bind the analytes following washing procedures. The experiment resulted in an inverse curve as expected with no overlap between the different concentration levels. Drug free urine samples (2 ml) were also spiked with 25 ng/ml Δ-9THCand Δ-9-THCd_3 in separate experiments and subjected to the same procedures in ten different experiments with absorbance readings at 430 nm showing a consistent recovery within ±10% for both analytes: Δ-9-THC - 2.0332 and Δ-9-THCd_3 - 1.8977. No interfering substances were found during the experiments.

O6.09
9:30 THE BIOCHEMICAL AND MORPHOLOGICAL CHANGES ASSOCIATED WITH MACROPHAGES AND OSTEOCLASTS WHEN CHALLENGED WITH INFECTION

Erin Wiggers, Michelle Tucci, Colin Jackson
University of Mississippi Medical Center

Osteomyelitis is a bacterial infection of the bone that occurs frequently as a complication of open fractures and various kinds of orthopedic surgery. This infection can often lead to more extensive surgeries and even death of the patient. In animal models of osteomyelitis, the site of infection by *Staphylococcus aureus* was observed to have high numbers of both macrophages and osteoclasts, both of which may contribute to large amounts of osteolysis and tissue damage. In order to test immune response in both types of cells, two cells lines, a macrophage cell line and a macrophage cell line stimulated to become osteoclasts by the addition of receptor activator of nuclear-factor κB (RANKL), were exposed to lipopolysaccharides, opsonized *S. aureus*, and unopsonized *S. aureus*. The results showed that both cell types activated a biochemical cascade that included the release of cytokines and nitric oxide associated with cell damage and death in response to infection. However, macrophages and osteoclasts differed in response magnitude, most likely due to differences in cell-membrane receptors. This data supports the growing body of research that links the immune and skeletal systems. Further understanding of biochemical pathways shared by the two systems could lead to significant advances in the success of prostheses and the treatment of osteomyelitis.

9:45 Break

O6.11
10:00 EFFECTS OF 5% NEUTRAL NaF VARNISH ON DENTAL RESTORATIVE MATERIALS

Hilary Sartain[1], Steven Magee[2], D. Mitch Hutto[2], and Aaron D. Puckett[2]
[1]Mississippi College, [2]University of Mississippi School of Dentistry

Sodium fluoride varnish is commonly used in dental clinics for the prevention of cavities. The varnish is applied as an alternative to the more cumbersome sodium fluoride gel trays that were once used. The objective of this study was to determine the effects of a 5% neutral sodium fluoride varnish on the color and surface roughness of dental restorative materials. The restorative materials used included a glass ionomer, compomer, and three composites including a flowable, nanohybrid, and hybrid. The samples were molded into 2x11mm discs using a silicon mold and cured using the Ultra Lume 5 light source. Three specimens were in the treatment group and two specimens were used as controls. Baseline

color measurements using a color spectrophotometer and roughness values were measured using a Confocal Microscope. A 5% sodium fluoride varnish was applied to the materials. The varnish was removed using a custom made reciprocating wear tester that has been modified to hold soft bristle toothbrush heads. The materials received three treatments with color and roughness values measured following each treatment. Comparison of the roughness values and color change showed no significant changes in surface roughness after any of the treatments. Therefore it may be concluded that new NaF varnish does not have a significant impact on the surface roughness or color of common restorative materials.

O6.12
10:15 DELTA REGION HEALTH EDUCATION LEADERSHIP PROGRAM (DR-HELP): A TRI-STATE COLLABORATION TO ACCELERATE RURAL HEALTH DELIVERY

Rob Rockhold[1], Diane Beebe[1], Bonnie Carew[2], Susan Clark[1], Gaarmel Funches[1], Janie Guice[3], Richard Streiffer[5], John Wheat[4]
[1]University of Mississippi Medical Center, [2]Mississippi State University Extension Service, [3]Mississippi Rural Physicians Scholarship Program, [4]University of Alabama College of Community Health Sciences, [5]Tulane University School of Medicine

DR-HELP, a component of the Delta Regional Initiative (DRI) sponsored by the Institute for Improvement of Minority Health and Health Disparities in the Delta Region, seeks to improve communication among rural health professional pipeline training programs in Mississippi, Alabama and Louisiana. A preferred outcome will be recognition of "best practices" in recruiting, training and supporting trainees, followed by demonstration that trainees return to establish practices in underserved rural locations. The pipeline programs subsumed under DR-HELP will compare the efficacy of funding sources and directives from state legislatures, federal programs, and private resources to establish preferred pathways to improved training. Currently, pipeline programs focus on students underrepresented in health care training and attract diversity in race, geographic location (rural vs. urban) and age, beginning at the high school level and continuing through post-graduate residency. A basis for enhanced collaboration is partnership with the Mississippi Academy of Sciences for continuation of concurrent conferences with DR-HELP. The second rural health mini-symposium jointly organized with the Academy will occur during this meeting. A website hosted by the Rowland Medical Library at the University of Mississippi Medical Center will form an additional collaborative tool. DR-HELP is a novel initiative with significant promise to improve health care delivery in the Delta region. Funded by DHHS' OMH (Prime Award Number 1 CPIMP091054-01-00) and written by R. Rockhold at the UMMC by a grant with UMMC's DRI. The findings, opinions and recommendations expressed therein are those of the author and not necessarily those of UMMC or DHHS.

O6.13
10:30 STUDENTS COMMUNICATING THE IMPACT OF THE DEEP WATER HORIZON OIL SPILL ON THE GULF COAST

Pequetta Andrews, Porsha Newell, Joshua Pridgen, Tajai Dismuke, Monica Moore, Susan Bender
Jim Hill High School, Jackson, MS, United States

A group of five high school students has developed a novel approach for communicating technical and scientific data to the general public with respect to the explosion of the deep water horizon and the long term impacts the oil spilled into the Gulf of Mexico.

Divisional Business Meeting and Student Awards Presentation

11:00 -11:45 AM

Friday Afternoon (February 18th)
Ballroom I

Title: DR-HELP: Rural Physician Pipelines and the Delta Regional Initiative

Date and Time: 1:00 – 4:00 p.m.; Friday afternoon, February 18

Division: Health Sciences

Program Contact: Rob Rockhold, Ph.D. (rrockhold@umc.edu); Jessica Green (Jgreen3@umc.edu; 601-984-2810)

Program Objectives:
Upon completion of this mini-symposium,

participants will have:

1. Become familiar with the structure of and outcomes expected from the Delta Region: Health Education Leadership Program (DR-HELP);
2. Recognized the imperatives for increased coordination among programs supporting rural health care training pipelines in the Delta region; and
3. Interacted with faculty and students from major pipeline programs participating in DR-HELP.

Suggested Audience:

- University faculty involved in pre-professional health care training
- Pre-baccalaureate students considering professional health care training
- High school teachers and students with interest in health care education programs
- Individuals concerned with access to health care delivery in medically underserved Delta areas of Mississippi/Alabama/Louisiana

Speakers:

- Diane Beebe, M.D., Professor and Chair, UMMC Department of Family Medicine
- Bonnie Carew, Ph.D., Rural Health Program Leader, Mississippi State University Extension Service
- Gaarmel Funches, Ph.D., Director, Community Education/Outreach, Division of Multicultural Affairs, UMMC
- Janie Guice, Executive Director, Mississippi Rural Physicians Scholarship Program
- Rob Rockhold, Ph.D. Deputy Chief Academic Officer, UMMC
- Richard H. Streiffer, M.D., Professor, Dept of Family & Community Medicine. Tulane University School of Medicine
- John Wheat, M.D., **MPH**, Professor of Community and Rural Medicine, University of Alabama School of Medicine

1:00-Welcome: Introduction to the Delta Regional Health Education Leadership Program (DR-HELP) **Dr. Rockhold**

1:15

Title: The University of Alabama Rural Health Leaders Pipeline: Adaptation to meet the Goals of the Delta Regional Institute

Presenter: John Wheat, M.D., MPH, Professor of Community and Rural Medicine, University of Alabama School of Medicine

Introduction: The goal of the University of Alabama Rural Health Leaders Pipeline is to produce health professionals, especially physicians, for rural Alabama who are leaders in developing healthy communities. Built on the foundation of the medical school clinical branch campus and associated Family Medicine residency in Tuscaloosa, the Pipeline's plan was begun in 1990 to include programs from high school through practice. Fifteen programs, both internal and external to the campus have been coordinated to address this goal. To date, over 600 rural Alabama students have been selected to participate. Aside from participants who have become nurses, pharmacists, veterinarians, dentists, public health workers, and teachers, at least 52 have become practicing physicians—40 practicing in rural Alabama (29 FP, 5 FP-Ob, 3 Ped, 1 Internist, 1 Surg, and I Radiol), 8 in non-rural Alabama, and 4 in other states. Forty have graduated from medical school, but remain in training; 79 are currently in medical school. However, the map showing geographic distributions of participants in the medical program and of practicing physicians demonstrates underrepresentation in the Black Belt/Delta region of Alabama.

Rural Program Plan/Design: The Delta Minority Rural Health Pipeline Program is an adaptation of the Minority Rural Health Scholars Program component of the Pipeline to assure that 10 minority students per year, oversampling the Black Belt/Delta Region of Alabama, gain access to the Pipeline. The plan includes selection of 10 students per year to attend the University of Alabama for four consecutive summers after graduation from high school in courses and activities to prepare for medical school. Individualized counseling and course planning produce plans of study, which are supplemented by field trips and seminars featuring professional development and health disparities in the region.

Summary Outcomes: After one year, the Delta Minority Rural Health Pipeline Program admitted five students from the Black Belt /Delta region, and five from other rural counties. Seven are from counties that rate as Persistent Primary Care Health Professional Shortage Areas. There were nine African Americans and one Hispanic. Seven hometowns were less than 5000. All 10 enrolled in Biology with lab (2 A's, 3 B's, 3 C's, 1 D, 1 W), seminars, fieldtrips, and shadowing with a preceptor near home. The students emphasized the *challenge* of college level work with emphasis on the work of studying, the *eye-opening* experience of the rural

hospital visit, the *motivation* of seeing minority physicians, and the *importance* of networking.

Strengths and Limitations: Students, counselors, and faculty agree that the program is strong and highly worthwhile for attracting and orienting Black Belt/Delta area student to the Pipeline. Weaknesses include the uncertainty of funding to assure follow-up with these students and with others to secure a place for them in the continuing Pipeline and to integrate better with K-12 recruitment programs. We cannot yet match opportunities elsewhere to assure admittance to medical education through progressive admission policies.

Recommendations: Secure stabilizing funding and engage in planning to create progressive programs of admissions to medical schools in the Lower Delta Region.

1:30
Title: Growing our Own: Starting High School Students on the Track to a Medical Career

Presenter: Bonnie Carew, Ph.D., Rural Health Program Leader, Mississippi State University Extension Service

Introduction: The bottom line for health and health care in Mississippi is clear – more people per capita develop potentially fatal diseases than elsewhere in the country and, when they do, it is more difficult for them to access the care they need. In response to this concern, Mississippi State University Extension Service developed and directed the Rural Medical Scholars (RMISSISSIPPI) program. 2007 marked the tenth summer of this successful program. The program was not offered in 2008 or 2009; but was reinstated during the summer of 2010. The program seeks to encourage high school students to pursue a career as rural family medicine physicians within Mississippi.

Rural Program Plan/Design: Interested high school students, between their junior and senior years, are exposed to academics and experiences relevant to the life of a family medicine physician. During the five-week summer program, the Scholars enroll in two pre-medicine courses, "shadow" local physicians, and participate in a variety of activities related to rural physicians. Successful completion of the program results in gaining seven college credit hours and real life exposure to a potential future career path in medicine.

Summary Outcomes: To date, 236 students have participated in the program. The students come from 59 of Mississippi's 82 counties and 21% have been minority students. Approximately seventy-five percent of RMISSISSIPPI graduates go on to pursue a health-related career, be that as a physician, nurse, dentist, physical therapist, counselor, or medical researcher. Fourteen percent of those that have graduated from college have gone on to medical school; of the first 14 to have graduated from medical school, 10 are participating in primary care residency programs, 5 within Mississippi.

Strengths and Limitations: Whether a strength or a limitation is debatable, but this is a program for academically talented students; it is not a skills building program. Due to the academic rigor of taking 7 college credits in a summer term, students must have a minimum 25 ACT score to be eligible. The program has garnered a strong reputation within the state, but is subject to funding uncertainties.

Recommendation: Further collaboration with related programs such as the Mississippi Rural Physicians Scholarship Program to insure continuity of support throughout the full chain of professional development and secure a stable source of funding.

1:45
Title: Growing Our Own Primary Care Physicians

Presenter: Janie Guice, Executive Director, Mississippi Rural Physicians Scholarship Program

Introduction: Faced with the fewest physicians per capita and an aging rural physician workforce, the Mississippi Legislature created the Mississippi Rural Physicians Scholarship Program (MRPSP) in 2007. Unlike previous scholarship programs with similar names, this pipeline program identifies rural college sophomores who aspire to return to their rural roots to practice primary care medicine.

Rural Program/Design: A true longitudinal pipeline program was developed: Initial—prior to matriculation to medical school; Medical school training; and Generalist residency training. An initial practice phase was also suggested. MRPSP provides a means for a rural Mississippi student to: earn admission to medical school afforded by the newly developed Direct Entry process; earn MCAT preparation valued at $2,000 through program participation; earn $120,000 medical school

scholarship in return for 4 years of service and learn the art of healing from practicing rural physicians.

Summary Outcomes: The first three years of growth and development will be discussed. On the medical school level, MRPSP has grown to thirty scholars receiving $30,000 per year and two second year Family Medicine residents of which there are 15 females and 17 males. Their primary care fields are: Family Medicine (13), Internal Medicine (8), Med-Peds (5), OB/GYN (3), and Pediatrics (3). Twenty eight college students are in the pre-matriculation stage.

Strengths and Limitations: Strengths include the early identification and nurturing, Direct Admissions consideration, Medical Encounter experiences and academic enrichment of those most likely to practice primary care in a small town. The scholarship amount frees the future rural physician from burdensome debt that may otherwise drive them away from primary care fields.
Limitations to be discussed include the lack of steady funding for the undergraduate phase and unknown future State scholarship funding. More troubling is the weak math and science preparation rural sophomores received in their small high schools coupled with poor standardized test taking skills.

Recommendations: Expand collaborative efforts with rural high schools that promote rigorous high school coursework such as the Mississippi Scholars program sponsored by the Mississippi Economic Council, the high school Rural Scholars Program and other summer science based programs. Grass roots funding of medical scholarships for a local recipient is an investment in the future health of that community.

2:00 BREAK

2:10
Title: Health Careers Recruitment and Enrichment Pipeline Programs

Presenter: Gaarmel Funches, D.H.Ed, Director, Community Education and Outreach, University of Mississippi Medical Center, Division of Multicultural Affairs

Introduction: Established over 30 years ago, in an effort to increase the number of underserved, underrepresented students in pursuing health careers, pipeline programs were established to expose area middle school, high school and college students to health careers through multi-dimensional outreach efforts such as health career exploration, health science readiness and simulated rigor using a science-based college preparatory curriculum.

Rural Program Plan/Design: Our academic enrichment and outreach programs begin at the elementary school level extending to pre-professional levels. Annually, approximately 170 students are exposed to appropriate age and grade level academics in science, mathematics, critical thinking, and computer application and technology. Students are nurtured through practical experiences on practice examinations such as ACT, MCAT, and DAT exams. Coordinated outreach efforts have created sustainable and long-term partnerships with public school districts, colleges and universities, associations, and other educational organizations. As a result of our long-term commitment in increasing the number of underrepresented students in medicine or URM (as defined by the American Association of Medical Colleges), we have recently extended our programming efforts by launching our STEP program as a satellite program in two off-campus locations. In 2011, our goal is to have served nearly 300 students from across the state.

Summary Outcomes: The successes of our programs are demonstrated by our admission processes, retention and graduation rates. The Division of Multicultural Affairs works closely with campus administrators, faculty and staff to ensure that our academic programs are inclusive, promote diversity and maintain quality academic standards. Having tripled the number of admits and graduates from nearly 30 years ago reveal our long-term impact in building a diverse health care workforce.

Strengths and Limitations: Our strengths are most noted through support from the medical center community, including our long-term partnerships with Jackson Public Schools, Tougaloo College and Alcorn University. Over 50% of our students participate in our programs in subsequent years. Also, the exposure a student receives as a participant is unique, as there is no access to health care facilities without being a part of the program. Unfortunately, there are programs focused on scientific and health career exploration, in which there is a competition for students because stipends are offered in similar programs. This poses a threat, as there is always competition for students.

Recommendations: Leveraging resources among academic enrichment programs for students is always

an option. School districts should consider using our programs as models for increasing interest in the physical sciences, as well as, implementing health education and health career exploration within the curriculum.

2:25
Title: Professional Portal Program: Post-baccalaureate Training to Advance Rural Health Care

Presenter: Rob Rockhold, Deputy Chief Academic Officer, University of Mississippi Medical Center

Introduction: Recognizing unmet needs, the University of Mississippi Medical Center School of Graduate Studies in the Health Sciences implemented a two-year Masters program in 2004 to provide underrepresented students interested in rural health care a unique path into medical or dental training. Operating on a premise that students raised in rural areas underserved by heath care are more likely to return to such areas to practice than those raised in an urban environment, the Professional Portal Track was initiated. In 2010, the program changed the title to the Professional Portal Program (PPP) to reflect administrative changes.

Rural Program Plan/Design: Students who meet federal guidelines for rural residence are referred to the PPP by admissions committees in schools of medicine and dentistry. If students meet academic benchmarks in the Masters curriculum and standardized tests, direct admission into their professional school of interest is granted. Training in rural health practice is embedded in the curriculum.

Summary Outcomes: Sixty-four students have entered the PPP since 2004, with 48 graduates as of May, 2010. The overall graduation rate is 90% (43/48) with an overall rate of entry of graduates into professional training at UMMC is 63% (27/43). However, the rate of entry of PPP matriculants into any professional degree training program is 79% (38/48). Women comprise 66% of graduates and 44% are African-American. Five graduates from the inaugural class of 2006 received M.D. degrees from UMMC in May, 2010 and one received the D.M.D. degree. All have entered residency programs and are in good standing. A survey of the most advanced students was conducted in 2007 to which 16/18 graduates (89%) responded. Of these, 80% responded "Likely" or "Very Likely" to the question "How likely are you to practice in a medically-underserved community?", while 53% indicated a desire to practice in a community of >10,000 persons.

Strengths and Limitations: The PPP serves only a small group of students, and no student has yet progressed to an independent practice. No guarantee of service in an underserved/rural location is required, so the desired outcome of improving health care delivery in such locations has yet to be verified. The PPP does identify, and provide a pathway into professional health care training that would not otherwise be available to the demographic of student served.

Recommendations: Program outcomes cannot be adequately evaluated until at least 2013. Development of additional means to maintain association of PPP graduates with rural practitioners during post-graduate training is highly desirable.

2:40
Title: From Promise to Practice

Presenter: Diane K. Beebe, MD; Professor and Chair, Department of Family Medicine, University of Mississippi Medical Center

Introduction: The University of Mississippi Medical Center (UMMC) and the Department of Family Medicine recognize the need to expand primary care in our state to improve access and positively impact health disparities and disease outcomes. The presenter will discuss initiatives fostered by UMMC and the Department of Family Medicine throughout medical school and residency to promote primary care and facilitate placement of providers into rural areas.

Rural Program Plan/Design: The Department works with all levels of medical student at UMMC as they matriculate, sponsors student outreach programs related to primary care and supports both student and resident curricular initiatives related to rural experiences. Required student and resident rotations exist. The Department sponsors a nationally-recognized Family Medicine Interest Group. The Department partners with Mississippi AHEC state-wide programs, works with our Mississippi Academy of Family Physicians, Mississippi State Medical Association and other entities to promote family medicine. There are strong affiliations with a state-wide network of hospitals and health entities.
Summary Outcomes: USMLE Family Medicine/Primary Care Match results over the past

several years will be reviewed. In addition, UMMC Department of Family Medicine physician placement data will be presented as well as resident and student feedback from their rural experiences.

Strengths and Limitations: Strengths include the commitment of the Department and UMMC to increasing awareness among students for primary care needs in our state. Being the only allopathic medical school in Mississippi affords opportunities for influence. Limitations to be discussed include a track of low student interest in primary care, payment and re-imbursement issues, the uncertainties of the impact of the new health care reform on primary care. However, overall, health care reform is seen as a positive for future support of primary care and rural practice.

Recommendations: Further promotion of primary care and rural practice by a variety of entities. Increased legislative funding for primary care initiatives. Continued support for scholarship and pipeline programs to support students interested in a rural practice. Collaboration with the newly established Osteopathic school in Hattiesburg. Further state wide collaboration for training of students and residents in rural areas.

2:55

Title: The Tulane Rural Immersion Program – An Innovative Community-based Rural Program for 3rd Year Medical Students.

Presenter: Rick Streiffer, MD, Professor of Family & Community Medicine, Tulane University School of Medicine

Introduction: The rural physician workforce shortage is among the most pressing primary care needs in our country. The Josiah Macy Jr. Foundation has called for "stronger ties between academic health centers and other primary care sites and the communities they serve," and for "medical schools….to increase the size and strength of the primary care workforce…[via] actions known to increase the number of students and trainees choosing careers in primary care…[including]…creating longitudinal immersion clinical experiences in community primary care settings." The Tulane Rural Immersion Program (TRIP) was developed to address this issue. Initiated as a pilot in academic year 2010-11 with grant support from the Macy Foundation, TRIP's mission is to increase the number of graduates who choose to enter rural primary care practice in medically underserved communities across the region, as a result of exposure to and immersion in longitudinal clinical training in a rural community.

Rural Program Plan/Design: In the immersion model, TRIP students live and train for nine months in rural communities under the supervision of an experienced family physician preceptor who mentors the student in professional and personal aspects of being a physician, guides the student's clinical work with other health professionals in the community, and provides a home base for continuity care and a community health application project. Since each student is the only student in a community, each has a greater opportunity to get hands-on experience in a variety of procedures and specialties. School of Medicine faculty visit students several times to oversee and evaluate the students, while also providing clinical education to the local medical staff. School of Public Health faculty guide and mentor TRIP students in a community health application project. Prior research on the immersion model has shown that students benefit from the one-on-one and longitudinal training that is lacking in the traditional tertiary training centers, the mentorship of the preceptor, the socialization to rural life, and the independence and higher level of responsibility. Students' academic performance equals those in the traditional track, yet are more skilled and confident. Communities and preceptors benefit from the presence of the student by their connections to medical schools and with future physicians. Importantly, students in rural immersion programs enter primary care and rural careers in far larger numbers than those in traditional tracks.

Summary Outcomes: Following a seven month developmental phase, TRIP began the pilot year in July 2010 with three volunteer students matched to experienced Family Medicine preceptors in three rural south Louisiana communities. We have been pleased with the positive and supportive attitudes of the medical school faculty charged with responsibility for the traditional curriculum, who, despite some understandable skepticism about the logistics and the equivalency of the learning, have largely embraced the concepts and benefits underlying this model. Communities hosting students have been universally positive and appreciative, with enthusiastic feedback about the opportunities that they see for enhancement of their medical staff, the value added from the student community projects, and the potential for attracting more physicians to practice in their areas over time. Student performance to date, though very preliminary, appears academically equivalent while student feedback is

enthusiastic, summarized by what we have heard on site visits: "*TRIP has exceeded my expectations*." A review of the students' clinical logs confirms that their clinical experience is very strong and broad.

Strengths and Limitations: The program has proven to be logistically complex and intensive to develop and implement, but community receptivity, signs that constructive community-academic partnerships are developing, and a positive student response is consistent with that reported from other immersion programs in the US. Long term placement and retention into rural practice, the overall desired goal of this program, will by necessity be evaluated over future years.

3:10 BREAK

3:20
Student Panel: Experiences in and Impressions of ural Rural Health Training Pipeline Programs.

3:50
Investigator's Conference (Closed):

HISTORY AND PHILOSOPHY OF SCIENCE
Chair: Michael Dodge,
McGill Law School
Vice-chair: Paula Smithka,
Universityof Southern Mississippi

THURSDAY MORNING
Room 228

O7.01
9:00 THE UNCERTAINTY PRINCIPLE OF SCIENCE AND THE GOD QUESTION OF PHILOSOPHY

Dr. Kant Vajpayee, University of Southern Mississippi, MS 39406

Our material world is explainable by Newtonian physics. The spiritual world remains beyond the reach of science. Newton's laws, however, fail to explain the material world at the micro/nano and the giga/tera levels. For these levels quantum physics is the tool. Could physics at these levels hold some clue for the *God question* of the philosophers! The science at the atomic level is stuck with an observation that has been called the *uncertainty principle*. Is there any connection with the rationality underlying the uncertainty principle and the philosophers' question on whether there is a God? Is the scientist's *uncertainty* at the quantum level hinting towards the uncertainty of God?

O7.02
9:30 TELEOLOGICAL EXPLANATIONS IN BIOLOGY: ANCIENT GREECE THROUGH THE ROMANTIC ERA

Dr. Ken Curry, University of Southern Mississippi, MS 39406

Aristotle (384–322 BC) is not only one of the most famous Greek philosophers, but also the first "theoretical biologist" whose extensive writings in biology have survived. His understanding of the world included four causes of which the final cause provided the reason why something exists, its teleology. This was an internal principle in organisms; something for the sake of which an organism existed. Changes in Aristotle's views can be historically traced to the seventeenth century when René Descartes (1596–1650) presented a major challenge to Aristotelean teleology. Descartes described a mechanical universe and the heart as a mechnical pump, whereas William Harvey (1578–1657) was trained in the Aristotelean tradition and described the circulation of blood in terms of Aristotelean teleology. Acceptance of Harvey's work came in part from its re-interpretation by Descartes in mechanical terms, despite Harvey's descriptions being more accurate than Descartes'. Gottfried Wilhelm Leibniz (1646–1716) introduced the concept of force to replace Cartesian movement. The concept of force was formalized by Sir Isaac Newton (1643–1727), and permeated biological explanations. The Romantic Era (ca. 1790–1830) was characterized by an awe of the complexity of life forms in contrast to the elegance of Newtonian physics. Immanuel Kant (1724–1804) advocated an internal force, in an era of newly discovered forces, to explain change in life forms (Critique of Teleology 1790/ 2nd ed. 1793). Johann Friedrich Blumenbach (1752–1840) ascribed to organismal development a "formative" force he dubbed Bildungstrieb which roughly paralleled Kant's teleology.

O7.03
10:00 EVOLUTIONARY AND NATURALIZED EPISTEMOLOGICAL APPROACHES AS AN ADJUVANT TO SCIENTIFIC ENDEAVORS

Michael Dodge, McGill University, QC H2W 2A2

The fundamental locomotive force behind the generalized field of science is unquestionably the discovery and utilization of knowledge about our universe. Though the specific fields may vary from analyses of the interstices of atomic movement to the nature of black holes, the ostensible goal of such human endeavor is to increase and refine what we know. While traditional epistemology is commonly employed in knowledge analysis, at times it may lack a direct connection to the natural world. It is toward this end that the related but differentiable fields of evolutionary and naturalized epistemology lend their aid. While favored logical principles may enable epistemologists to begin their task, there always remains the possibility that one's belief is in fact false, despite one's principled assertions to the contrary, or that the way in which one comes to believe what one does is flawed. Putting questions to an empirical test may assuage some of these fears, and may even confirm, or at the very least fail to refute, what was a priori utilized in any given epistemological quandary. This presentation is therefore intended to evoke reminiscence, cogitation, and discussion on the place of the natural world as not only the object of our knowledge, but also as its progenitor or, at the very least, its place as a tool in the portmanteau of modern epistemologists, and it will hold that while arguably flawed in certain respects, evolutionary and naturalized epistemology are nevertheless useful tools in the ever present march towards greater scientific understanding.

10:30 BREAK

O7.04
10:45 TELEOLOGICAL EXPLANATIONS IN BIOLOGY: ARISTOTLE TO KANT

Dr. Paula Smithka, University of Southern Mississippi, MS 39406

Teleology, the concept of goal-directedness, has historically played a role in biological explanations, sometimes positively, but more often, at least since the 17th century, taken negatively as endorsing an external force imposing a *telos* on organisms. This interpretation led to criticisms and ultimately rejection of teleological explanations in biology. Aristotle (384-322 BC) is perhaps the first and best known philosopher to consider goal-directedness in his accounts of organisms. His theory of the four causes (*aitiai*), better considered as the four "explanations," includes a "final cause" or "what-it-is-for" as an internal principle that coincides with the "formal cause" for organisms. The physician Galen (129 - 199/217) is apparently responsible for corrupting Aristotle's notion of final cause to be an externally imposed *telos*. The idea is further promulgated by medieval philosophers like Avicenna (980- 1037), Averroes (1126-1198), and St. Thomas Aquinas (c. 1224-1274). By the modern period, René Descartes' (1596-1650) *bête-machines* and mechanistic view of the universe was the accepted scientific paradigm. Mechanism banished teleology from biological explanations as "unscientific," or "theology." Immanuel Kant (1724-1804), however, claimed that organisms must be reflected on as "natural purposes." Like Aristotle, the *telos* was considered to be internal to the organism; for Kant, it seemed to be a force, unknown to us, but "linked in one principle" to "the physical-mechanical connection." Hence, proper understanding of teleology along the lines of Aristotle's or even Kant's views provides a useful and scientifically respectable basis for some biological explanations

O7.05
11:15 BIOARCHAEOLOGICAL INVESTIGATION OF THE FORD SITE (22JA564)

Samuel Huey, University of Southern Mississippi, MS 39401

This presentation reports on the archaeological excavation and interpretation of a prehistoric burial recovered in Grand Bay, Mississippi during Summer 2010. Analysis of the mortuary practices seen and the skeletal material presented helps us better understand lifeways on the Gulf Coast. Ceramics found at the Ford site (22JA564) indicate that it was occupied between 500 and 2000 years ago. Analysis of this burial provides insight to the time of most intense occupation, which occurred between AD 800 and 1200. The human remains are representative of one individual; the preservation is good, but the bones are fragmentary. They consist of several teeth, portions of mandible and maxillae; fragments of hand, rib, and vertebra, and pieces of femur. Despite their condition, the fragments that are available for interpretation reveal information as to the age and sex as well as the diet and activities of the individual. Femur measurements indicate that the bones likely belong to a woman. One of the molars

show evidence of hypercementosis and the teeth were badly worn. The specific attrition pattern suggests a varied diet that included both agriculturalist and marine resources. Evidence of a muscle tear is seen on the proximal femur. The burial and associated cultural material produce critical evidence as to the identity of the people who created the shell middens and indicate the nature of activities conducted at the site. Results of analysis of burial are compared to skeletal remains recovered from Cedarland(22HA5xx), Greenwood Island(22JA516), and Richard (22HR635).

11:45 LUNCH BREAK

O7.06
1:30 AN INQUIRY INTO THE ALLEGED DEATH OF PHILOSOPHY

J. Sylvia IV, Itawamba Community College, MS 39401

Stephen Hawking's recently released "The Grand Design" claims on the first page that philosophy is dead because it hasn't kept up with the sciences. Several strategies for responding to this claim have been taken, ranging from ceding that the branch of philosophy known as metaphysics may be dead to claiming that doing any science at all requires a philosophic framework. After briefly discussing the historical relationship between philosophy and science, I will argue that the current relationship is somewhat more complex and subtle. First, in many fields scientists and philosophers are working together closely on contemporary issues such as understanding the concepts of 'species' in biology or 'consciousness' in neuroscience. I will argue that this sci-phi collaboration is beneficial for both science and philosophy, and has application to several branches of philosophy including ethics. Second, I argue that science can, in a meaningful way, be equated to philosophy. Many scientists claim that they have no need for philosophy in their day-to-day work. This is likely true for the many scientists who are doing the work that Thomas Kuhn would call "puzzle solving." However, scientific work that is pushing boundaries or asking questions that might lead to a shift in paradigm resembles the traditional work of metaphysics, in that what changes is not the evidence of experimental results, but rather the interpretation of the very same results. If Hawking concludes that philosophy is dead, it is only because he is firmly entrenched within a particular paradigm.

2:00 Divisional Business Meeting

O7.07
2:20 FREE LOGIC AND ONTOLOGICAL COMMITMENT

William Suttle, University of Southern Mississippi, MS 39402

W.V.O. Quine argues that quantified modal logic (QML) has the consequence of commitment to Aristotelian essentialism - the position that objects have some of their characteristics essentially and others accidentally. For Quine, the statement: (Ex) nec (x > 7) means that there exists something and this something has one of its characteristics essentially - the characteristic of being greater than 7. For this reason (and because Quine views Aristotelian essentialism as inherently problematic), he claims that QML should be avoided. Quine's position is only sound given his interpretation of the 'E' quantifier as implying existence. But there are logics that provide alternative interpretations of E. For example, free logic employs both an E (called a particular quantifier) that carries no existential import and an E! (the existential quantifier) which explicitly carries existential import. Thus, free logic allows one to quantify into modal contexts without commitment to essentialism (or any ontological position). I suggest that free logic is the best logic for quantifying into modal contexts. One may use free logic to formally capture modal discourse and valid inferences, but without ontological commitment. If a philosopher holds an ontological position, such as Aristotelian essentialism, then free logic provides the formal tools to make existential commitments explicit. Ultimately, what exists is not determined by formal language. A formal language is a tool - it should be strong enough to capture valid inferences (including modal inferences) without the interpretation of the formal language itself implying existence.

O7.08
2:45 SUPERSTRING THEORY: AN EXERCISE IN GENERATING PROGRESS

Thomas Walden
Millsaps College

Using Peter Woit's Not Even Wrong as a primary source, this paper seeks to establish superstring theory as one that is fundamentally unscientific. Woit's extensive historical analysis of the development of particle physics, as well his discussion of the problems inherent in superstring theory's development/application shall be used to create an argument regarding the scientific status of the theory itself. This argument shall focus primarily on superstring theory's inability to be tested and, likewise, its inability to make predictions. Superstring theory is, this paper concludes, at best an exceedingly complex, esoteric system of concepts with no readily available method of verification, and at worst a misguided attempt to re-create the period of rapid progress that characterized particle physics during the mid-to-late 20th century.

MARINE AND ATMOSPHERIC
Chair: LaToya Richards
Univ of Mississippi Med Center
Vice-Chair: Zelma Cason
Univ of Mississippi Med Center

Thursday Morning
Room 231

O8.01
8:45 ECOLOGICAL OBSERVATIONS ON TWO MYSID SPECIES, TAPHROMYSIS LOUISIANAE AND T. BOWMANI FROM THE UPPER REACHES OF DAVIS BAYOU, JACKSON COUNTY, MISSISSIPPI

Mohammed Mulkana*, Richard Heard
Gulf Coast Research Laboratory, University of Southern Mississippi.

During an 18 month ecological study of the mysids of the low salinity upper reaches of Davis Bayou, Jackson Co., MS, Taphromysis louisianae and T. bowmani were found to be dominant throughout the sampling period with the sporadic occurrence of two mostly mesohaline species Americamysis almyra and A. bahia. T. Louisianae were found in greater abundance in fresh and oligohaline conditions compared to the more euryhaline T. bowmani, which occurred throughout the study area. Samples collected with fine mesh dredge nets in shallow (1-2 m) sites and initially an epibenthic sled was employed for deeper water sites, however due to anoxic bottom conditions sampling was discontinued at these sites. Mysids were more abundant at sites where submerged aquatic vegetation (e.g., Ruppia maritime) was present. Reproduction occurs year round with ovigerous occurring in nearly all of the samples collected during the study. During the warmer months higher percentage of the brooding was higher. Due to its shorter developmental time stage I embryos were observed far less frequently than those of stages II and III. Both species showed similar Ecological characteristics. Both species of Taphromysis are year round residents of the upper Davis Bayou system.

O8.02
9:00 FULL WATER COLUMN CURRENT EVENTS NEAR THE SIGSBEE ESCARPMENT AND RELATIONSHIPS TO LOOP CURRENT FRONTAL EDDIES IN THE GULF OF MEXICO

Kevin McKone
Copiah-Lincoln Community College, Wesson, MS, United States

Four full water column moorings were deployed between 16 February 2000 and 11 April 2004 near 92± west longitude above and below the Sigsbee Escarpment in the Gulf of Mexico (GoM). These moorings were designed to characterize current velocity, temperature and salinity of the water column in a region along the continental slope. Both active and passive remote sensing were used in conjunction with the moorings to assess near surface circulation during the deployments. The GoM along the Escarpment can be modeled as a two layer system. The top layer with a depth of »800 m is influenced by surface flows, a middle 400-500 m transition layer which has limited kinetic energy, and a 1200-1500 m bottom layer exhibiting uniform current as a function of depth. Using wavelet analysis and Hovmoller graphs on current meter data, concurrent satellite measurements, three full water column events (FWCE) were observed in the 15-40 cpd range. These FWCE acted coherently, lasted from a couple days to a few weeks, and were only observed when the moorings were between or near the Loop Current (LC) and a Loop Current frontal eddy (LCFE). Conservation of potential vorticity in the water column due to the affects of LCFEs and LC meanders, is used to explain the FWCEs. The 15-40 cpd kinetic energy signal observed, along with the uniform currents in the bottom layer, suggest that LCFEs and LC meanders might be forcing TRWs along the Sigsbee Escarpment.

08.03
9:15 AIR-SEA CARBON DIOXIDE FLUX WITHIN THE NORTHWEST MISSISSIPPI BIGHT REGION MEASURED WITH A 3-METER DISCUS BUOY

Andrea Braatz, Stephan Howden
University of Southern Mississippi, Stennis Space Center, MS, United States

With the continued increase of carbon dioxide (CO_2) emissions, researchers are concerned with accumulation of excess CO_2 within the atmosphere. The ocean is an important sink for the drawdown of atmospheric CO_2 concentrations. Due to high spatial and temporal variability, CO_2 fluxes in the coastal ocean are not well characterized. More specifically, data for the northern Gulf of Mexico coastal region is lacking. A time series analysis of

air-sea CO_2 flux from May through December 2009 was conducted using data collected by the University of Southern Mississippi's Central Gulf Ocean Observing System 3-meter discus buoy, located within the northwest Mississippi Bight. Data collected by the buoy included wind speed and direction, sea surface temperature (SST), sea surface salinity, pressure, and CO_2 partial pressure. Air-sea CO_2 flux rates calculated from the buoy data indicated the northwest region of the Mississippi Bight was an overall net sink for CO_2 during the study period. Flux rates varied temporally, with changes in SST and wind speed having the greatest influence on flux. Although air-sea flux calculations should use the wind speed relative to surface water, the wind speed relative to fixed geographic coordinates (Eulerian reference frame) is customarily used because of lack of data on surface currents. An investigation of CO_2 flux rates computed from wind speeds relative to water, and Eulerian wind speeds, showed that the two methods give significantly different flux estimates.

08.04
9:30 PHYTOPLANKTON DYNAMICS ACROSS THE CONTINENTAL SHELF OF THE NORTHERN GULF OF MEXICO AS REVEALED BY HPLC-DERIVED PIGMENT SIGNATURES

Sumit Chakraborty, Steven Lohrenz
The University of Southern Mississippi, MS, United States

Taxonomic composition, size indices and biomass of the phytoplankton community were determined along several cross-shelf transects in the northern Gulf of Mexico (NGOM) as a part of the Gulf-Carbon program and other associated projects funded through NSF, NASA and NOAA. Knowledge of the planktonic community structure is critical in understanding the biogeochemical processes in the dynamic margins of the continental shelves, especially the NGOM which is particularly complex, due in part to the influence of a large river system, the Mississippi River. The Mississippi river, drains ~40% of the continental United States and is the largest source of freshwater, suspended sediments, particulate and dissolved organic matter and nutrients to coastal waters in North America. The input of these materials strongly influences the biological production in the NGOM. Preliminary pigment analyses revealed a cross-shelf gradient in chlorophyll-a associated with the low salinity water masses related to freshwater inputs from the Mississippi River and other rivers. Shifts in phytoplankton community spatially, were found to be associated with the salinity gradient along the shelf waters. Seasonal differences in were also observed and were closely related to the differences in the physico-chemical environment.

08.05
9:45 TEMPORAL AND SPATIAL DISTRIBUTIONS OF PHYTOPLANKTON PRODUCTION ALONG THE SHORELINE OF THE BAY OF SAINT LOUIS, MISSISSIPPI ESTUARY

Adam Boyette, Donald Redalje
The University of Southern Mississippi Department of Marine Science, Stennis Space Center, MS, United States

The relationship between photosynthesis and irradiance (P-E) was used to model potential primary production along the shoreline of the Bay of Saint Louis, MS (BSL) estuary. Monthly surface water samples were taken at six stations along the shoreline of the BSL estuary during incoming and outgoing tides to assess possible environmental influences on phytoplankton photosynthetic performance. Stations were located along the eastern and western shores of BSL to examine the influence of the Jourdan and Wolf rivers, respectively, on primary production. Field sampling began in July 2010 and will continue through December 2010. Over the course of the study, two short-term experiments examined the influence of atmospheric forcing (week), and tidal and irradiance effects (diurnal) on P-E parameters. Because the waters along the BSL shoreline are shallow and often turbid, preliminary results suggest that light availability may be the principle factor regulating phytoplankton production at selected stations along the BSL shoreline. The results from this study will provide the first estimates of primary production within the BSL system and will facilitate ecological research and monitoring efforts within regional estuaries.

10:00 BREAK

08.06
10:15 THE USE OF LASER DIFFRACTION TO ESTIMATE THE SIZE DISTRIBUTION OF PARTICLES SUSPENDED IN THE NORTHERN GULF OF MEXICO

Sarah Epps, Steven Lohrenz, Kevin Martin
University of Southern Mississippi, Stennis Space Center, MS, United States

Suspended particulate matter (SPM) plays an important role in the marine environment. Its presence affects light availability to marine organisms. Settling and resuspension of SPM is important in mediating the distribution of mineral and organic matter in the marine environment. SPM can also provide a vector for transporting pollutants. Depending on location and time of different types of particles, SPM may consist of lithogenic sediments, living organisms or detrital organic materials. The role of SPM in influencing optical conditions and as a component in different biogeochemical processes is strongly dependent on the size distribution of the particles. Particle sizes range from 0.4 um to hundreds of microns in diameter. This research evaluates the size distribution and total concentration of SPM in the Northern Gulf of Mexico using a Laser In-Situ Transmissometer (LISST) by Sequoia Scientific, during five research cruises in 2009 and 2010, prior to the Deepwater Horizon event. We hypothesize that size distributions populated by larger particles will be more prominent in areas of high concentrations of SPM in proximity to river

08.07
COMPARATIVE WIND REGIMES AT OPEN WATER AND AIRPORT SITES

Loren White[1], Daniel Canales[1], Heping Liu[2]
[1]*Jackson State University, Jackson, MS, United States,* [2]*Washington State University, Pullman, WA, United States*

Since 2007, the Jackson State University Meteorology Program has operated a meteorological flux measuring station in the middle of Ross Barnett Reservoir, approximately 2 km from the nearest shore. We will present a statistical description of the 10 m winds observed at this site in comparison to standard wind observations made at local airport sites. The comparison will be analyzed separately according to season. Since the sites are within about 20 km of each other, only the local exposure/fetch and roughness would be expected to contribute to variations in wind regime. The greatest exposure at the reservoir site is oriented northeast/southwest, while the airport at KJAN is oriented north/south and at KHKS is oriented northwest/southeast. Although surface-influence mesoscale circulations could also be occur at the site locations, the scale of forcing is unlikely to be observable except under very calm conditions.

08.08
10:45 SATELLITE OBSERVATION OF MESOSCALE EDDY-EDDY INTERACTIONS IN THE NORTHERN GULF OF MEXICO

Erin Denton, Jerry Wiggert
University of Southern Mississippi, Stennis Space Center, MS, United States

The Northern Gulf of Mexico is frequently impacted by mesoscale eddies. These features can alter nutrient supply to surface waters and thus affect phytoplankton biomass. This study focused on the response of phytoplankton to interactions between mesoscale eddies. Specifically, modifications to phytoplankton distributions due to two types of mesoscale interactions were targeted, cyclone-anticyclone pairing that resulted in jet formation and cyclone transgression of the Gulf of Mexico Loop Current (GLC) that resulted in anticyclone formation. The oceanic satellite imagery used in this study allowed for observing and detecting patterns of large spatial - short temporal biophysical phenomena. Obtained imagery included 8-day averaged MODIS-Aqua chlorophyll concentrations, 8-day averaged MODIS-Terra sea surface temperatures, and near-real time Envisat sea surface height anomaly fields. A unique visualization of the chlorophyll data was created using a split color palette such that both offshore and near shore qualities are simultaneously discernible. All data sets were animated so as to highlight their temporal evolution and reveal features of interest that were then examined in detail. Eddies were identified using sea surface height anomaly and temperature fields. Examination of the spring 2007 fields revealed a chlorophyll enhancement within typically oligotrophic waters directly following the transgression of a cyclonic eddy through the GLC. Further, the spring 2007 fields revealed a narrow band of chlorophyll enhancement extending across the shelf coincident with a cyclone-anticyclone pair.

11:00 DIVISIONAL BUSINESS MEETING

THURSDAY AFTERNOON

Division Poster Session
1:00p-3:30p

P8.01
USING ENVIRONMENTAL MODELING, TECHNOLOGY, AND COMMUNICATION FOR EARLY WARNING AND PREDICTION OF LAND FALLING TROPICAL CYCLONE/HURRICANES

Francis Tuluri, Suseela R Reddy, Duanjun Lu, Toneka Rogers, Bhaskar Rao V Dodla, Anjaneyulu Yerrammilli
Jackson State University, Jackson, MS, United States

Advanced environmental modeling and technology tools can be collectively put together for a study of tropical cyclone/hurricane intensity change and early warning prediction In the present study, we propose a scheme for early warning prediction of land falling tropical cyclone/hurricanes consisting of Weather Research Forecast (WRF) Environmental Mesoscale Model and radio soundings. WRF Model simulations are used for prediction of the structure, intensity change and track of the hurricane Alex. Hurricane Alex began to strengthen reaching Category 5 on 26th June, 2010 and its winds reached peak intensity of 100 mph and the pressure fell to 948 mb, making landfall in Belize, Mexico over Gulf of Mexico, on 30th June 2010. The model is run on a doubly nested domain centered over the central Gulf of Mexico, with grid spacing of 90 km and 30 km for 6 hr periods, from June 21th to August 30th. We used atmospheric soundings over the Gulf coast stations during hurricane land falling for prediction and communication. We computed the vertical velocities using Convective Available Kinetic Energy (CAPE) obtained from soundings at the equilibrium level (EL) for the period June 21- 30, 2010. The model results are in good agreement with the observations. Alex produced severe weather conditions seen by the observed CAPE values, as signs of developing tropical hurricane earlier to its manifestation. The environmental modeling and technology tools facilitate an advanced prediction and communication system (APCS) for tropical cyclone/hurricane prediction and awareness.

P8.02
ASSESSING GENETIC DIVERGENCE BETWEEN GULF OF MEXICO AND SOUTH ATLANTIC GRAY TRIGGERFISH POPULATIONS BY USE OF MICROSATELLITE MARKERS

Patrick Carter[1], Avery Sward[1], Luca Antoni[2], Eric Saillant[2]
[1]Cooperative Intern Program between the Mississippi Gulf Coast Community College-Jackson County Campus Honors Biology Students, Gautier, MS, United States, [2]Department of Coastal Sciences, and The University of Southern Mississippi Gulf Coast Research Laboratory, Ocean Springs, MS, United States, [3]the National Aeronautics and Space Administration, Stennis Space Center, MS, United States, [4]the Institute for Marine Mammal Studies, Gulfport, MS, United States

The gray triggerfish (*Balistes capriscus*) is a reef fish that frequents tropical and temperate coastal waters of the Eastern and Western Atlantic Ocean. In the United States, the species is abundant and exploited along the South-East Florida coast and throughout the Gulf of Mexico (hereafter Gulf). Little is known to date regarding the genetic structure of Gray Triggerfish populations. A recent study based on a mitochondrial DNA marker did not reveal significant genetic differences between Atlantic and Gulf Gray triggerfish. The mitochondrial DNA dataset had however limited power to detect subtle population structure and may not have revealed subtle genetic heterogeneity among populations. In the present study, we re-evaluate the possible occurrence of genetic divergence between Gulf and Atlantic Gray triggerfish using hypervariable nuclear-encoded microsatellite markers. Muscle and tail fin tissue samples were collected from Gray triggerfish sampled off localities along the Northwestern Gulf and the Southeast Atlantic coasts, respectively. DNA was extracted from tissue samples using a standard phenol chlorophorm protocol. Samples are being assayed at microsatellites markers recently developed for Gray triggerfish and the data will be used to test for genetic isolation between Gulf of Mexico and South Atlantic Gray triggerfish.

P8.03
LONG-TERM VARIATION OF POPULATION ATTRIBUTES AND *PERKINSUS MARINUS* INFECTION IN OYSTERS FROM MISSISSIPPI GULF COAST

Yungkul Kim[1], Joshalyn Hines[1], Terry Wilborn[1], Eric Powell[2]
[1]Jackson State University, Jackson, MS, United States, [2]Rutgers University, Port Norris, NJ, United States

NOAA's National Status and Trends Mussel Watch Program is the longest continuous, nationwide contaminant monitoring program in U.S. coastal waters. As part of the Program, oysters were sampled each winter at three sites along the Mississippi Gulf coast (i.e. Pascagoula Bay, Biloxi Bay and Pass Christian) from 1995 to 2008. To examine the interannual variation and to assess temporal trends, oysters were analyzed for population indicators (e.g. length, sex, reproductive stage), and also for prevalence and infection intensity of the oyster pathogen *Perkinsus marinus.* Initiation of infection and progression of oyster Dermo disease caused by this pathogen are favored by high temperature and high salinity. Long-term mean and median infection intensity, and long-term prevalence of *P. marinus* infection will be compared among the three sites and also among the sampled years with the expectation, based on previous Gulf-wide studies, that infection intensity will be higher in years being under La Niña event, which produces increased water temperature and salinity, and that lower infection intensity and prevalence will be obtained either during or right after the extended El Niño period, suggesting the close relationship between the *P. marinus* epizootics in the Gulf and the long-term climatic changes. Analysis on temporal variability of other biological and environmental variables will be conducted and results will be presented.

MATHEMATICS, COMPUTER SCIENCE AND STATISTICS

Chair: Elegenaid Hamadain,
University of Mississippi Medical Center

THURSDAY MORNING
Room 226

O9.01
8:30 A PRELIMINARY DESIGN OF A VIRTUAL SECURITY LABORATORY FOR INFORMATION SYSTEMS AND SOFTWARE ENGINEERING PROJECTS

Jeremy Bouldin, Sandeep Thumma, Roy Geoghegan, Mounika Challagundla, Natarajan Meghanathan
Jackson State University

We are currently working on a NSF funded CCLI/TUES project that involves setting up a virtual laboratory for students at Jackson State University (JSU) and throughout the nation to be able to use for their Systems and Software Engineering courses. The laboratory will consist of over 20 personal computers combined through distributed computing to create multiple test beds. We are using software provided by VMware, Microsoft, and Red Hat to provide services such as DHCP, FTP, Active Directory, and DNS. VMware software will allow us to generate multiple operating systems onto one machine and within in a small network, providing them with the said services. A series of network devices such as switches and routers will be used to create a small LAN. Each test bed will be an internal network where the host machine connects to the LAN through a switch with other host machines while non-host machines inside the network will provide a pool of computing resources. The LAN will be accessed through a virtual private network to insure security of JSU network. The students will have access to file transfer, application, print, and database servers which will contain exercises and their projects. We will provide students with lab exercises, hash modules, and other technologies/ methodologies that will prepare the students for the world of cyber security. Students will also have access to network analysis tools, design software, and intrusion detection systems. Students will also have the chance to create client-server systems, pipe and filter systems, and repositories.

O9.02
9:00 CLASSIFICATION OF EEG SIGNALS BASED ON EMPIRICAL MODE DECOMPOSITION AND BAYESIAN NETWORKS APPLICATION

Ram Bilas Pachori[1], Jyotirmay Gadewadikar[2], Ognjen Kuljaca[3]
[1]Indian Institute of Technology, [2]Sensors and Automation Laboratory, Alcorn State University, [3]Bodarski Institute

In this work, application of intelligent decision methods in the detection of epileptic seizures though the classification of EEG signals is presented. This works brings together the results on EEG signal classification, and bayesian networks for medical decision making.
The human brain is a highly complex and a non-linear system. The disorder in the human brain creates a lot of physiopathological diseases, especially the Epileptic Seizure. Epileptic seizures are the outcome of the transient and unexpected electrical disturbance of the brain. The electroencephalogram (EEG) signal has been the most utilized signal to clinically assess brain activities. The detection of epileptic seizures in the EEG signals is an important part in the diagnosis of epilepsy. Bayesian networks can explore how multiple cause-effect relationships can be inferred for a disease presence.

Parameters extracted from EEG signals are highly useful in diagnostics. Many nonlinear methods have been proposed to extract new parameters linked to the electrical activity of the brain. Recent work shows that the EEG signals exhibit significant nonlinearity. In this work a novel scheme based on the discrete wavelet transform (DWT) and approximation entropy (ApEn) for epilepsy recognition is proposed. Further, this work will present the results on how bayesian networks can be employed as one viable option for computer-aided detection of epileptic seizures by representing the relationships between diagnoses, physical findings, laboratory test results, and EEG signal classification findings. The results on classification of EEG signals and a Bayesian networks application will be proposed.

09.03
9:30 GEOGRAPHICAL STUDY OF GRADUATES FROM MVSU THROUGH GIS

Jonathan Henderson, Qiang He, Darrell James, Raymond Williams
Mississippi Valley State University

Mississippi Valley State University (MVSU) is a public Historical Black College and University (HBCU) founded in 1950. Here we use ArcView GIS software to analyze Graduate Survey for MVSU. We studied the states where most incoming freshmen are from as well as which of these states have produced graduates according to the 2009 commencement program. Being that the is in Mississippi, it was not a surprise to see that Mississippi has the most incoming freshmen and produced the most graduates. So we went deeper to study the counties of Mississippi that produced the most MVSU graduates in 2009. We are expecting that the majority will come from the delta region of the state surrounding the school.

10:00 BREAK

09.04
10:30 CREATING CLEAR ANIMATIONS: FONT CHOICES IN ADOBE FLASH ANIMATION

Kimberly Pegues, Pamela Lawhead
University of Mississippi

In this study, we examine the characteristics of fonts, especially true-type fonts in Adobe. The goal is to understand how fonts are rendered in FLASH. We will identify those fonts which are best suited to the process that Adobe FLASH uses to display fonts in an animation. We will also demonstrate multiple instances of animation where the best fonts are used as well as instances where the font do not work well in animation. In each instance, an analysis of the solution will be discussed. That is, we will demonstrate how an animation displays a font and how the weight of the font can impact the clarity of the font's display. We will show that the clarity of a font in an animation is a direct result of the number of pixels used to build that font.

O9.05
11:00 GENERATING MATROID RESULTS FROM PROJECTIVE GEOMETRY

Toyin Alli, Talmage Reid
University of Mississippi

This project investigates the connection between Projective Spaces and Matroid Theory. The aim of the project is to develop conjectures for matroids from existing results on Projective Spaces. Numbers associated with certain matroids that measure the size of a largest clone set in these matroids are defined in this project. These numbers are related to classical numbers on the sizes of k-arcs in Projective Geometry. New conjectures for matroids are given based on results in Projective Geometries.

O9.06
11:30 A NEW BERTRAND DUOPOLY GAME AND ITS DYNAMICAL BEHAVIORS

Kenric Wright, Cornelius Miles, Xiaoqin Wu
Mississippi Valley State University

Bertrand duopoly game is the competition of two companies. Since each company takes different action to adjust its price and its rival also does the same, Bertrand duopoly model may be very complicated. We propose a new nonlinear demand function and a linear cost function and then investigate the complexity of the corresponding dynamical behaviors of the game such as stability and bifurcations. Computer simulations will be used to confirm our theoretical results.

Thursday Afternoon

O9.07

1:30 OBJECT ORIENTED BAYESIAN NETWORK STRUCTURE IMPLEMENTATION PROCEDURE

Jyotirmay Gadewadikar[1], Ognjen Kuljaca[2]
[1]Sensors and Automation Laboratory, Alcorn State University, [2]Bodarski Institute

In this paper, we describe an object-oriented implementation of Bayesian network. We use a Bayesian network to exploit the explicit structure of the domain model to derive a graphical representation for learning. In this work it is explained how an object oriented approach is appropriate for the encoding of independencies in the network topology which admits the design of efficient procedures for performing computations over the network. A Bayesian Network is a graphical model that represents relationships of probabilistic nature among variables of interest. This paper also elaborated available Bayesian networks for implementing an automated breast cancer detection support tool. The Bayesian networks are employed as one viable option for computer-aided detection by representing the relationships between diagnoses, physical findings, laboratory test results, and imaging study findings. Today' Medical Decision Systems are growing in their complexity. A medical decision making process required multitudes of observations and data, which should be used in the decision making simultaneously. From an engineering point of view, the sheer amount of data and evidence ask for a high level of automation of this decision making process. Physiological knowledge has a typical causal representation, which can be used in diagnostic expert systems to provide suitable explanations of the cause-effect relationships connecting findings with diagnostic conclusions.
In this paper object oriented implementation approaches of Bayesian Networks will be explained, a brief background concerning causal networks, probability theory and Bayesian networks will also be given.

O9.08
2:00 USE OF BINARY CODES TO DETERMINE ANCESTOR-DESCENDANT RELATIONSHIPS IN K-ARY TREES

Pervis Fly, Natarajan Meghanathan, Raphael Isokpehi
Jackson State University

A *K*-ary tree is a tree in which any node can have from zero to *k* child nodes. It takes O(*n*) time to determine ancestor-descendant relationships, using traditional traversal algorithms (pre-order, post-order or in-order), between any two nodes in a *K*-ary tree. In this research, we illustrate the use of binary codes on *K*-ary trees to determine ancestor-descendant relationships in O(1) time. Each node in a *k*-ary tree is assigned a unique binary code. This starts with code 0 for the root. The code for a child node is based on the number of siblings and is appended to the code inherited from the parent. Thus, a node with a code 001 creates 4 children, each with codes 00100, 00101, 00110, and 00111 respectively. With this method, any pair of nodes can be checked to

determine if an ancestor-descendant relationship exists. This is done by identifying the number of bits in the potential ancestor and comparing those bits with the leftmost bits of the potential descendant. If there is a match, then an ancestor-descendant relationship exists. For this implementation, a 5-ary tree composed of up to 50,000 nodes has been formed in 192.6 milliseconds. The average depth of this tree is 10.4. So far, assigning binary codes to a 5-ary tree composed of 50,000 nodes takes 397.5 nodes per millisecond. Our next task is to compare the performance of the binary code-based approach with the traditional tree-traversal algorithms. This research has been funded through the NSF-Mississippi EPSCoR grant (EPS-0556308).

O9.09
2:30 CALCULUS INSTRUCTORS' ASSESSMENTS OF PRIOR KNOWLEDGE ERRORS

Jana Talley
Jackson State University

This presentation was developed from a study that investigated the views that Calculus instructors hold concerning prior knowledge. The term prior knowledge is operationalized in this study as any skill or understanding that a student needs to successfully navigate through a Calculus I course. A two part qualitative study consisting of student exams and instructor interviews was employed to examine how instructors approach prior knowledge mistakes when they are evaluating student work. During each interview, the instructors were presented with Student Error Examples (SEEs) and asked to assign a grade out of the given point value. Analysis of these interviews revealed that although calculus instructors agree that prior knowledge is essential to success within a calculus course, their assessments of the SEEs varied widely in several cases, particularly those containing prior knowledge mistakes. The SEEs whose scores ranged from below 70% to above 80% were labeled as having Wide Score Ranges (WSR). To better understand these perceived inconsistencies among the instructors' scores, an adaption of Leatham's (2006) Sensible Belief Systems was applied to the interview data. We use a sensible system to show that each WSR can be reconciled by considering full descriptions of the instructors' approaches to assessing students' prior knowledge errors.

Friday Morning

Poster Session (9:00-10:00)

P9.01
ROLE OF MISUSE CASE DIAGRAMS IN ANALYZING THE SECURITY REQUIREMENTS OF A SOFTWARE ENGINEERING PROJECT

Mounika Challagundla, Jeremy Bouldin, Roy Geoghegan, Natarajan Meghanathan, Hyunju Kim
Jackson State University

A "misuse case" is used as a business process modelling tool for software development. It can be described as a sequence of actions that can be performed by any person or entity to harm the software. A misuse case diagram can be simply represented as a use case diagram from the point of view of an attacker and will incorporate two relations, "mitigate" and "threaten," in addition to those typically found in the use case diagrams. As a pilot study, we have currently developed misuse case diagrams for three client-server applications that require on-line transactions, appointment management and dynamic scheduling. We observe that misuse cases can be extensively used in analyzing the security requirements of a software engineering project as well as to identify the critical assets for the system and define the security for each asset. Misuse case diagrams model the threats that could exist for a system and help to identify the requirements or features that need to be incorporated to the software at different stages of the lifecycle. With a proper misuse case diagram, several security risks that could pose a serious threat to the software in the deployment phase could instead be easily identified during the early stages of the lifecycle. The misuse case diagrams can also be used to develop the security-related test cases during the evaluation phase of the software. This work has been supported through NSF-CCLI/TUES grant. In future, we plan to develop standard misuse case diagrams for typical client-server applications and disseminate them online.

P9.02
A POLYNOMIAL SOLVER IMPLEMENTATION USING WEIERSTRASS-DURAND-KERNER ALGORITHM

Krishna Aditya, Ramya Sreepathi, Aamani Alahari, Murali Pingali, Venkata Polavarapu, Madhu Aditya
Alcorn State University

As part of the work for Scientific Computation course taught in spring 2010, we investigated root finding algorithms of univariate polynomials of high degrees. If the degree of the polynomial is less than five, we have closed form solutions. For higher degree polynomials there are no closed form solutions. But we have iterative algorithms like Weierstrass-Durand-Kerner (WDK) algorithm, which can give approximations to all the n roots of a n^{th} degree polynomial. The coefficients of the polynomial could be real or complex and the roots are in general complex. The algorithm needs initial approximations to the roots and it rapidly converges to all the roots of the polynomial, simultaneously. We have implemented the algorithm in C++ and we have tested the implementation in both Linux and Windows XP environment. The code is available on request. The current implementation has limitations due to the limits on double data type of C/C++ language. We are in the process of porting the implementation to PHP which has arbitrary precision arithmetic capabilities and also allows us to create a web interface to this polynomial solver. Also we are investigating the methods to generate the initial approximations for the roots. We have tested the implementation with randomly generated polynomials of degree up to 100. It finds all the roots of the polynomials to high accuracy without fail.

P9.03
A POLYNOMIAL SOLVER IMPLEMENTATION USING ABERTH ALGORITHM

Krishna Aditya, Madhu Aditya
Alcorn State University

Just like Weierstrass-Durand-Kerner (WDK) algorithm, Aberth Algorithm is an iterative algorithm to find all the roots of a polynomial, simultaneously. We have reported our team's work on WDK algorithm in another abstract for this conference. Rate of convergence of Aberth Algorithm to the roots of the polynomial is cubic whereas rate of convergence of Weierstrass-Durand-Kerner (WDK) algorithm is quadratic. Aberth algorithm requires the computation of the first derivative of the polynomial and is slightly more complex to implement as compared to WDK algorithm. Our C++ implementation of the Aberth algorithm which has been quite extensively tested is available on request. We are porting this implementation to PHP to make use of arbitrary precision capabilities of PHP and also to implement a web interface for the polynomial solver. Such an implementation will allow us to solve polynomials of very high degrees. In our tests, the implementation finds all the zeros of polynomials to high accuracy. We have tested with randomly generated polynomials up to degree hundred.

P9.04
MICRO-CALCIFICATION DETECTION IN DIGITIZED MAMMOGRAMS USING FILTER BASED METHODS

Krishna Aditya, Kwabena Agyepong
Alcorn State University

The interpretation of mammograms requires extensive experience, training and attention to detail on part of radiologists. This work is to develop an automated system to detect clusters of micro-calcifications, which are deposits of calcium salts. They are early indication of cancerous changes in the breast tissue. They are smaller than 5mm in feature size, and typically are in the range of 0.1-1mm. A cluster is defined to be more than three calcifications within 0.1 cm^2 area of mammogram. We have implemented our system in MATLAB. Our method consists of three stages. The first stage applies spatial filtering on the mammogram. The second stage consists of applying threshold on the results of the first stage to detect the micro-calcifications and the third stage consists of running a clustering algorithm on the result of the previous stage. In the first stage we have used two different spatial filtering techniques. The first method is to use a Differential of Gaussian (DOG) filter tuned to detect blobs which have typical size of the micro-calcifications. The other filtering technique is to apply a single filter optimized for texture feature extraction by discriminating between texture representing micro-calcification and texture representing the normal tissue. Our tests indicate 90% detection rate by the system. To enhance the performance of the system we are investigating use of adaptive thresholds and neural network classifiers.

P9.05
DATA POINT VISUALIZATION AND CLUSTERING ANALYSIS

Cornelius Myles[1], Joyce Bevins[2], Keenan Black[3]
[1]Mississippi Valley State University, [2]Elizabeth City State University, [3]North Carolina Agricultural and Technical State University

The primary purpose of this research project was to create a research tool for 3D data point visualization and clustering analysis, which is one of the most popular data analysis methods in bioinformatics and cheminformatics. For this purpose, we have implemented the Barnes-Hut Tree algorithm in C# to visualize cluster structures of 3-dimenisional data and added the function to a visualization tool, called PlotViz, which is written in C# and Microsoft XNA graphic libraries, developed by the CGL research lab in Indiana University. We have also performed clustering analysis of real research data used in IU bio- and chem-informatics research groups. Among many clustering algorithms available, in our analysis, we have applied two popular clustering algorithms, k-means and hierarchical clustering, by using R, which is a standard statistical analysis tool, and compared the qualities by measuring "withinness" which is the sum of Euclidean distances between cluster centers and points for each cluster group. The results are also compared by visualizing the data points in 3D by using PlotViz.

P9.06
STUDENT ACHEIVEMENT IN MISSISSIPPI MIDDLE SCHOOLS AS A FUNCTION OF STUDENT EXPENDITURE AND STUDENT/TEACHER RATIO

Shonquelsa Thomas
Mississippi Valley State University

The research's focus is to determine the correlation between the student/teacher ratio and money spent per student, with the overall MCT II (Mississippi Curriculum Testing) score and the Math sub score in 50 Mississippi Middle Schools. The variables included were: Student Expenditure, student/teacher ratio, MCT II Scores, and the Math Sub Scores. Five districts were chosen and 50 Middle Schools were randomly chosen from these districts. The results were based on test scores listed on the Mississippi Department of education website. The information found was analyzed using SPSS (Statistical Program for the Social Sciences). The study showed that money was not an issue in education and that smaller classes did not improve scores.

P9.07
IMPROVING MATHEMATICAL AND COMPUTER SCIENCE SKILLS THROUGH PARTICIPATORY SENSING AT CENS

Latonya Garner[1], Karen Kim[2]
[1]Mississippi Valley State University, [2]Center for Embedded Networked Sensing, UCLA, Los Angeles

Integrating Embedded Networked Sensing (ENS) technology into learning opportunities based on concepts of participatory sensing is central to the CENS High School Scholars Program. Given this emphasis, students participating in the program become knowledgeable of statistical analysis, computer programming, and scientific research. Participatory sensing builds upon students' intense fascination, engagement, and involvement with technology to foster an inventive spirit and develop students' abilities to become creators instead of simple users of technology. The hypothesis is that these engaging computer science projects based on mobile phone technology will increase students' achievement in STEM and influence them to pursue careers in STEM. This will increase the instructor's knowledge and pedagogy by fostering innovation and inventiveness, which improves STEM education. The demands for greater numbers and diversity of students prepared for and interested in pursuing careers in STEM is gaining momentum as a critical step in maintaining U.S. competitiveness in the global economy. The study comprised a formative evaluation of the participants in the program focused on improving STEM abilities. Results show that CENS summer program has influence the interest of high school students in STEM. By immersing students in the research environment, they indirectly learned about college and could potentially develop aspirations to pursue degrees in STEM. Strong research experiences that connect students to "real world" research and involve them directly in the research community are significant for all. CENS research model will be beneficial to Mississippi Valley State University by utilizing wireless technology to engage students in motivating learning experiences.

P9.08
COMPUTER BASED INSTRUCTION AND THE EFFECTS ON STUDENTS' ATTITUDES AND CONFIDENCE IN A COLLEGE ALGEBRA COURSE

David Bramlett, Alicia Jefferson, Tor Kwembe
Jackson State University

Research has shown that a person's attitude affects the way they view, pursue, and achieve within that subject area. Numerous studies have focused on attitudes and mathematics and have found that there is a positive correlation between mathematical achievement, future aspirations in majoring in mathematics, and attitudes towards mathematics. In our poster session, we will discuss how the integration of computer based instruction has had a positive effect on students' attitudes towards college algebra and increased confidence in their learning outcomes. Pre and Post tests along with entrance and exit surveys were administered to students in college algebra through MyMathLab. .Both qualitative and quantitative data indicate that MyMathLab has increased student levels of confidence. Students also indicated through qualitative statements that they had a positive learning experience in college algebra.

10:00-11:30 Invited Symposium
Room 226

Presenters: Dr. Elgenaid Hamadain and Dr. Jamil Ibrahim.

EXCEL FOR DATA MANAGEMENT, DATA MANIPULATION, AND STATISTICAL ANALYSIS

Elgenaid Hamadain[1], Jamil Ibrahim[1], Anwar Ahmed[2]
[1]University of Mississippi Medical Center, [2]Strayer University, Jackson, MS, United States

The availability of spreadsheets with facilities for data entry, management, manipulation, and statistical analysis is very important. Excel is widely used for these purposes. Excel has several advantages include power and ease of use, but also have some problems for users. This mini-symposium addresses strengths, and weaknesses, when using Excel for data management and manipulation, and statistical analysis. Excel has a large range of statistical functions that are very useful. Summary statistics can be obtained from these functions or from the Analysis Tool. Excel's pivot tables are very powerful and are better than in many statistics packages to summarize data. For ANOVA, Excel is capable only to analyze designs that are limited to one or two factors when the data is balanced. Excel has facilities for regression analysis, but limited compared to other statistics package. Excel is a powerful environment for data manipulations, summaries, tabulations, graphical techniques, basic statistical analysis and can be used without reservations. However, for more advance data analysis Excel must be used in combinations with other standard software. Using other packages does not mean abandoning Excel, because many users do their data preparation in Excel, and then transfer the data into a statistical package for more advance analysis. In fact, all standard statistical packages can read excel files readily. The results can be reported directly or transferred back to Excel for presentation graphs to be added. This mini-symposium will illustrate all the aspects mentioned above with real examples.

PHYSICS AND ENGINEERING
Chair: Dr. James Stephens, USM
Vice-Chair: Partha Biswas, USM

Room 214

O10.01
9:15 THE LARGE HADRON COLIDER - A SPECTACULAR SCIENTIFIC TOY

Amin Haque
Alcorn State University

Particle accelerators are very powerful microscopes that can look into very small detail. High Energy Physics (HEP) looks into infinitesimally small dimensions, investigating the fundamental constituents of our universe and the forces that hold them together. The largest scientific "toy" of this decade, the LHC, reproduces conditions of 1 ps after the Big Bang. Superconductivity is the key technology for LHC. It consists of 1750 main superconducting magnets and 8000 superconducting correctors, and four state of the art detectors based on a superconducting magnet of size and energy never before attained. LHC is designed to provide collision at 14 TeV with a beam current of 0.58 A. The main dipoles are designed for possible ultimate operation at 9 T. The magnets are cooled to 1.9 K. About 15 GJ of magnetic energy are stored in superconducting magnets. Billions of particles flying off from each

LHC collision are tracked at four detectors, and then collaborating laboratories, to establish when and how they come together and what shapes they take. This could give clear signs of dimensions beyond length, breadth, height and time. Parallel universes could also be hidden within these dimensions. LHC will help to understand new states of matters and is likely to reveal the existence of new particles, for example the Higgs particle and super symmetry particles, and solve some other mysteries of the Universe like the nature of dark matter and dark energy, and strengthen the Standard Model.

O10.02
9:30 THE LARGE HADRON COLLIDER MAY SOLVE MYSTERIES OF THE UNIVERSE

Amin Haque
Alcorn State University

At the earliest moment of the big bang, the very hot Universe consisted of an extremely hot soup of fundamental particles "quarks, leptons and the force carriers" moving independently with very high energy. The "Higgs particle" interacted with these particles to give them mass. As the universe cooled to 1000 billion degrees, the quarks and gluons (carriers of the strong force) combined to form heavier particles like protons and neutrons. Every elementary matter particle has an antimatter partner with equal but opposite properties. Antimatter was created, along with matter, in equal amounts in the Big Bang, but it then disappeared. Ninety six percent **of our Universe is Missing or has "**Dark Matter" or "Dark Energy". Astronomers detect the gravitational effects of large amounts of matter and energy that cannot be seen. One possible explanation of dark matter is that it consists of supersymmetric particles. Gravity is the fourth force, and much weaker, but physicists do not understand how it fits in with the Standard Model. One explanation may be that our Universe consists of multi-dimensions and that gravity can "leak out" across the dimensions, making it appear weaker. At the Tev energy scale the LHC will recreate conditions that existed 1 ps after the big bang, and should be able to confirm the validity (or invalidity) of the Standard Model which describes the fundamental constituents of our Universe and the forces that hold them together satisfactorily.

010.03
9:45 LYAPUNOV EXPONENTS AND THE INVARIANT DENSITY RECONSTRUCTION OF CHAOTICMAPS: A SWARM INTELLIGENCE APPROACH

Partha Biswas
University of Southern Mississippi

The maximum entropy principle (MEP) is employed to reconstruct Lyapunov exponents and the natural invariant density of some well-known one-dimensional chaotic maps. Using a novel function reconstruction technique that is based on the application of swarm intelligence to maximize the Shannon entropy, an estimate of Lyapunov exponents and the invariant density of the chaotic maps are obtained. The accuracy and the stability of the algorithm are discussed by
comparing our results to the exact analytical values whenever available.

O10.04
10:00 CONJECTURE ON THE ANALYTICITY OF PT-SYMMERIC POTENTIALS AND THE REALITY OF SPECTRA

Lawerence R. Mead
University of Southern Mississippi

10:15 BREAK

O10.05
10:30 RECONSTRUCTING HYDROGEN DISTRIBUTION IN AMORPHOUS SILICON: AN INVERSE APPROACH BASED ON NMR AND INFRARED DATA

Rajendra Timilsina, Partha Biswas
University of Southern Mississippi

A method to reconstruct the distribution of hydrogen in amorphous silicon is presented. We study three different model networks with hydrogen concentration in the range from 8% to 25%. Starting with an arbitrary distribution of hydrogen atoms in the network, we impose experimental information such as the moments of the NMR spectrum and the type of hydrogen bonding configuration obtained from infrared spectroscopy. The structural and the electronic properties of the models with reconstructed hydrogen distribution are compared to the available experimental results.

O10.06
10:45 FROM MARKOVIAN TO NON-MARKOVIAN TO MARKOVIAN

Katja Schaefer, M. A. Novotny
Mississippi State University

Non-equilibrium systems with a continuous state-space that are described by a Markovian dynamics generally lose their Markovian character by an arbitrary pointwise (with respect to time) projection onto a discrete set of states with nearest neighbor coupling. We will show in theory that with averaging the time-dependence of the transition rates of the projected process, the dynamics can be made Markovian again. As will further discuss, this only conserves quantities of the same time-scale as the averaging procedure, but the information on shorter time-scales is lost.

O10.07
11:00 A COMPUTATIONAL PHYSICS APPROACH TO MULTI-SCALE STRUCTURES AND DYNAMICS in BIO-FUNCTIONALIZED SOFT NANO-MATERIAL

Ras Pandey
University of Southern Mississippi

Particles, chains and sheets are some of the basic constitutive units to model a range of physical, chemical, and biological systems. Chains and sheets (and heterogeneous objects such as aggregates, microgels, etc) to describe polymer chains, peptides, membranes, etc can be assembled from particles, the smallest units in the coarse-grained descriptions. Covering all scales from atomistic details, for example, in protein folding or nano-bio hybrid composites, is one of the challenging issues in computational science. Therefore, some level of coarse-graining is almost unavoidable in studying such systems. Attempts will be made to show how to incorporate pertinent details in coarse-grained models to address such complex issues as structure and dynamics of proteins, their scaffolding, and self-assembly of bio-functionalized nano materials.

Thursday Afternoon
Room 214

O10.08
1:00 PROBING LIGHT PSEUDOSCALAR, AXIAL VECTOR STATES THROUGH $\eta_b \rightarrow \tau^+ \tau^-$

Ahmed Rashed[1], Murugeswaran Duraisamy[1], Alakabha Datta[1]
[1]University of Mississippi, [2]Ain Shams University

In this paper, we explore the decay $\eta_b \rightarrow \tau^+ \tau^-$ as a probe for a light pseudoscalar or a light axial vector state. We estimate the standard model branching ratio for this decay to be $\approx 4 \times 10^9$. We show that considerably larger branching ratios, up to the present experimental limit of ≈8%, are possible in models with a light pseudoscalar or a light axial vector state. As we do not include possible mixing effects between the light pseudoscalar and the η_b, our results should be reliable when the pseudoscalar mass is away from the η_b mass.

O10.09
1:15 RADIATION FROM PARTICLES WITH ARBITRARY ENERGY COLLIDING HEAD-ON WITH NONROTATING HIGHER-DIMENSIONAL BLACK HOLES

Emanuele Berti, Vitor Cardoso, Barnabas Kipapa
University of Mississippi

We consider point particles with arbitrary energy per unit mass E that fall radially into a higher-dimensional, nonrotating, asymptotically flat black hole. We compute the energy and linear momentum radiated in this process as functions of E and of the spactime dimensionality D=n+2 for n=2,...,9 (in some cases we go up to 11). We find that the total energy radiated increases with n for particles falling from rest (E=1). For fixed particle energies $1< E\leq 2$ we show explicitly that the radiation has a local minimum at some critical value of n, and then it increases with n. We conjecture that such a minimum exists also for higher particle energies. The present point-particle calculation breaks down when n=11, because then the radiated energy becomes larger than the particle mass. Quite interestingly, for n=11 the radiated energy predicted by our calculation would also violate Hawking's area bound. This hints at a qualitative change in gravitational radiation emission for $n\geq 11$. Our results are in very good agreement with numerical simulations of low energy, unequal-mass black hole collisions in D=5 (that will be reported elsewhere) and they are a useful benchmark for

future nonlinear evolutions of the higher-dimensional Einstein equations.

O10.10
1:30 ATOMIC LEVEL UNDERSTANDING OF ESTROGEN RECEPTOR INTERACTIONS WITH ESTROGENIC LIGANDS AND SMALL PEPTIDES

Marcus Johnson[1], Shawn Cole[1], Rajendram Rajnarayanan[2], Pradip Biswas[1]
[1]*Tougaloo College,* [2]*University of Buffalo*

Estrogen receptors (ER), upon binding with estrogenic ligands assume conformations suitable for dimerization and binding with signal transmitting coactivator proteins - the ER-dimer binds to DNA and leads to transcription of target genes. About 70% of breast cancers are found to depend on Estrogen Receptors for their growth. Ligands like tamoxifen and raloxifen are anti-estrogenic but tamoxifen resistant breast cancers lead to speculation about hormone-independent activation pathways of ER and possible ER mutants. Consequently, there is a growing need to understand the characteristic changes of ER as induced by estrogenic and anti-estrogenic ligands and to elucidate the effect of mutations. Atomistic simulation of ER-ligand complexes have been performed using GROMACS (GROningen Machine for Chemical Simulations) Molecular Mechanics code and OPLS (Optimized Potentials for Liquid Simulations) force-field to reveal the effect of mutations and estrogenic and anti-estrogenic ligands on the conformations and reactivity of ER. Results concerning the changes in H-bonding profile and the profile of electrostatic interaction energies between liganded-ER and external peptides will be presented.

O10.11
1:45 INVITED LECTURE: APPLICATION OF PHYSICS AND COMPUTATION IN MOLECULAR MODELING AND SIMULATIONS

Pradip Biswas
Tougaloo College

2:15 BREAK

O10.12
2:30 OCEAN-ACOUSTIC PROPAGATION MODELING RELEVANT TO PETROLEUM EXPLORATION AND RECOVERY

Michael Vera
University of Southern Mississippi

Improvements in understanding the propagation of acoustic energy in environments like the Gulf of Mexico can contribute to assessments of both the impact of petroleum exploration efforts and the contamination due to accidental releases. The nature of sound travel in the ocean under these circumstances is investigated by the use of computer simulations. Exploration efforts often involve arrays of airgun sources. These arrays are intended to primarily direct sound vertically downward so that the effect of the seabed on the acoustic energy reflected back toward the surface can be used to identify petroleum reservoirs. However, these sources can excite some horizontally propagating modes and acoustic energy can escape to the far field. Refinements to the modeling efforts associated with the sound that achieves long ranges can improve the assessment of the environmental impact of such sources. An additional investigation with relevance to petroleum efforts involves the possibility of acoustically tracking contaminants from an accidental release. An assumed distribution of a chemical contaminant such as oil is placed in the simulation environment and the travel of a sound pulse through a region of the ocean interior is computed. If there are clear impacts on the structure of the sound from having moved through the oil, then the method may be useful in monitoring actual events.

O10.13
2:45 MARINE ACOUSTIC SIGNALS AND NOISE

James Stephens
University of Southern Mississippi

In the analysis of the acoustic energy radiated by air guns we calculate a sound exposure as the integration of a squared pressure over time. We must choose an analysis window to include the signal: 5% and 95% levels of the integrated flux are commonly chosen to define the window. In the analysis of signals with less optimal signal to noise levels the result becomes very sensitive to the choice of the analysis window, and we are also faced with the need to compensate for the background power

level when computing exposure levels. This paper develops a simple rationale to determine the sound exposure due to a transient pulse train in the presence of stationary background noise.

O10.14
3:00 STRING THEORY AND AUM: INVESTIGATIONS INTO A TRUE THEORY OF EVERYTHING

Rich M. Mc Donald, S. Kant Vajpayee, Richard M. McDonald
University of Southern Mississippi

The common thread for humanity the world over has been an insatiable desire to understand the universe. Science and philosophy have struggled through history attempting to definitively explain the reasons for human existence. While the field of science has seen a remarkable revolution in the past century, the proponents of creationism have refused to yield. The scientific realm, long engaged in the search for an answer that would fill the void which lies between Quantum Physics and General Relativity, now believe that a theory of everything is within their grasp. This theory remained elusive until the development of string theory, which posits that everything in the universe is a manifestation of fundamental strings incredibly small in size. This basic belief system has been now refined into what is known as superstring theory, whose basis is the theory rests in the varied vibrations and interactions emanating from these fundamental strings. This presentation will explore the link between the string theory paradigm with the sound vibrations of the Sanskrit syllable Aum. Hinduism holds Aum as the most sacred syllable, considering it to be the origin of the universe itself. The presentation will attempt to show the inherent link between the auditory vibrations created in the recitation of Aum and the vibrations of string theory. If correct, the result would reconcile science and theological creation paradigms, and provide legitimacy to string theory's claim as the theory of everything.

O10.15
3:15 ALERT SYSTEM FOR HOMELAND SECURITY APPLICATION

Norvell Davis[1], Marsalis Charles[1], Kristopher Cooke[1], Jyotirmay Gadewadikar[2], Ognjen Kuljaca[1]
[1]Alcorn State University, [2]Sensors and Automation Laboratory, Alcorn State University, [3]Bodarski Institute

This work focuses on development of a demonstrative test bed to implement a security alert system for a possible Homeland Security Application. In this work we have presented an alert system with the integrated chip circuit. In this work we present a complete procedure including task definition, design of components, simulation, and finally implementation. The procedure described in this work allows one to achieve an alert system circuit which can be used for various applications including Homeland Security. In this work intermediate results and findings towards realizing an alert system are presented. The project is done at Alcorn State University's Department of Advanced Technologies, towards partial fulfillment of the B.S. degree in applied science with a specialization in Electromechanical Engineering Technology, the project is the part of the course Senior Design Project. This work presents an inexpensive way of realizing an alert system and recommends inexpensive of-the-shelf electrical and electronic elements.

O10.16
3:30 MOISTURE DETECTION FOR AGRICULTURAL APPLICATION

Ronderio Hunt[1], Tabari Jones[1], Jyotirmay Gadewadikar[2], Steve Adzanu[2]
[1]Alcorn State University, [2]Sensors and Automation Laboratory, Alcorn State University

In an agriculture application it is a well known practice to provide automatic watering devices, such as sprinklers, in order to supply plants with a proper amount of moisture so that the plants or natural growth will flourish. Time responsive watering devices have been generally found unsatisfactory since a plant's need for water is not solely a function of time, but varies with conditions of the planting medium, the atmospheric temperature, and humidity etc. This work focuses on development of a demonstrative test bed to implement moisture detection for a possible agriculture application. The moisture detector circuit is a water treatment system including a LED bulb, a moisture detector, and a control circuit responsive to the moisture detector to terminate power to the bulb when moisture is detected. In this work we have presented an advanced moisture detection unit with the integrated chip circuit. In this work we offer a complete procedure. The procedure described in this work allows one to achieve a moisture detection circuit which can be used for various applications including agriculture. In this work intermediate results and findings towards

realizing a moisture detection system are presented. The project is done at Alcorn State University's Department of Advanced Technologies, towards partial fulfillment of the B.S. degree in applied science with a specialization in Electromechanical Engineering Technology; the project is the part of the course Senior Design Project. This paper presents an inexpensive way of realizing a moisture detection system and recommends inexpensive of-the-shelf electrical and electronic elements.

3:45 Divisional Business Meeting

POSTER SESSION

P10.01
TWO PHOTON SPECTROSCOPY OF RUBIDIUM

Charles Young, Kileigh Peturis, Brad Crochet, Alina Gearba
University of Southern Mississippi

We have performed two-photon spectroscopy in a rubidium vapor cell at temperatures above 100°C. Two-photon transitions in rubidium are relevant as new optical frequency standards in telecommunications. In our experiment, the Rb atom is excited from the $5S_{1/2}$ ground state directly to the $5D_{5/2}$ excited state by simultaneous absorption of two identical photons. This two photon transition can occur since the $5P_{3/2}$ state is nearly in between the $5S_{1/2}$ and the $5D_{5/2}$ state. The two photons are provided by two counter-propagating laser beams originating from a single diode laser operating at 778.1 nm. From the $5D_{5/2}$ state the Rb atom will decay back to the $5S_{1/2}$ ground state via the $6P_{3/2}$ intermediate state. We have recorded 420.2 nm light corresponding to decay from the $6P_{3/2}$ state to the $5S_{1/2}$ state. We have identified four peaks in the fluorescence spectrum that belong to the ^{85}Rb and ^{87}Rb isotopes. We have measured the spacing between these peaks to be consistent with the ground state hyperfine splitting. Our results not only agree with the accepted values, but this experiment provides a baseline to begin a two-photon four-wave mixing experiment by allowing us to test our experiment and method.

PHYCHOLOGY AND SOCIAL SCIENCES

Chair: Shaila Khan,
Tougaloo Collge
Co- Chair: Sheree Watson,
University of Southern Mississippi

THURSDAY MORNING
Room 218A

O11.01
9:00 AGONISTIC BEHAVIOR IN MALE AND FEMALE GARNETT'S BUSHBABY (OTOLEMUR GARNETTII)

Kyle Edens, Shane Harrell, Claire Legg, David Hanbury, Sheree Watson
University of Southern Mississippi, United States

The behavior of nonhuman primates is often organized around a species-typical dominance hierarchy. Determination of dominance is most commonly reliant on the outcome of agonistic interactions. Bushbabies are generally considered a female dominant species but the extent to which their behavior conforms to the typical pattern of dominance behaviors has not been well characterized. We examined agonistic interactions in 12 Garnett's bushbabies (*Otolemur garnettii*) ranging in age from 3-17 years (mean= 10.83). Agonistic interactions, defined as biting, scratching, or rearing, were recorded in 6 male-female dyads while they were in the presence of small (41.5 g), medium (83 g), or large (124.5 g) food patches. Initiator and outcome of each agonistic encounter was recorded. The bushbaby that did not flee the agonistic encounter was characterized as dominant and the "winner", while the bushbaby that fled the agonistic encounter was characterized as submissive. Repeated Measures ANOVA indicated that females were more likely than males to initiate agonistic interactions ($p=0.03$), but there was no difference in the likelihood of females to win an agonistic encounter. Moreover, the availability of food did not influence either the initiation or outcome of agonistic interactions, nor were there any interaction effects between sex and the availability of food. These results suggest that *O. garnettii* may deviate from the normal pattern of nonhuman primate dominance behaviors. This outcome will be discussed in terms of the bushbaby social system.

O11.02
9:15 ASSESSING RELATIONSHIPS AMONG SOCIAL JUSTICE, VOLUNTEERISM, AND COMMUNALISM BELIEFS

LaShawn Thompson, Andrea Wesley
University of Southern Mississippi, United States

The literature suggests that volunteerism promotes serving others, challenging social injustices, and encourages peoples' connection to others. Studying volunteerism, social justice, and communal values may aid in understanding the importance of these concepts and how people may be motivated by each in their actions. This study investigated the relationships among social justice beliefs, volunteerism motivation and activity, and communalism values. The study also assessed the reliability of *The Communalism Scale*, a scale developed to assess communal values in persons who are descendents of African cultures. Contrary to predictions, the study found that there were no significant relationships between the variable social justice and the other variables in the study, volunteerism and communalism. The most interesting results of the study revealed unexpected findings in volunteer motivation and activity post Hurricane Katrina with participants from southern regions affected by this natural disaster. Also, surprising results about *The Communalism Scale* were revealed upon analysis. Findings revealed that *The Communalism Scale* was not only a reliable measure for the African-American population, but also proved to be reliable for the European-American population. The sample consisted of 214 university students who completed self-report questionnaires. Data were collected over a four week period. Questionnaires included a demographic form, *The Global Belief in a Just World Scale*, *The Volunteer Functions Inventory*, *The Communalism Scale*, and the *Marlowe-Crown Social Desirability Scale*. Findings in this study highlight the importance of accurately assessing variables that help in understanding belief systems and the importance of studying variables that influence prosocial behavior.

O11.03
9:30 ONLINE ROLE-PLAYING GAMES: HOW LEGITIMATE IS THE POTENTIAL FOR ADDICTION?

Brennan Ladner, Carmen Harper, Sheree Watson
University of Southern Mississippi, United States

Individuals who enjoy online gaming (Gamers) generally engage in these activities moderately and keep the entertainment value of the games in perspective. Occasionally, however, gaming behaviors become excessive and threaten to disrupt critical areas of the Gamer's life. When gaming behavior becomes excessive, Gamers frequently engage in maladaptive behaviors that are indistinguishable from those associated with other addictive disorders. Recently, a specific type of gaming, massively multiplayer online role-playing games, (MMORPGs) has generated particular interest among addiction experts. Unlike traditional computer games, in which the participant plays a game until some endpoint (e.g., puzzle solution) is reached, MMORPGs involve development of a social network of real people, all of whom are "citizens" in a computer-generated society. The degree to which social interaction is encouraged for advancement, and the fact that the virtual "world" does not stop while the player is away makes the MMORPG greatly different from any other genre of game. Some gamers have become so immersed in MMORPGs that they essentially forego the "real" world to maintain their positions in the virtual world. These gamers show symptoms of addiction similar to those of drug and alcohol addicts. This paper will review the information surrounding the status of MMORPG as a *bona fide* addiction. We will discuss the opinions of mental health professionals both for and against inclusion of MMORPG addition as a diagnostic category. Finally, we will present tentative treatment plans that are currently implemented to reduce and eliminate dependence on MMORPGs.

O11.04
9:45 TEENS AT RISK: SUICIDE, DEPRESSION AND SELF ESTEEM

Madhu Singh, Tiffany McGhee, Earnest Ducksworth
Tougaloo College, United States

This paper reports the findings of a Community Based Participatory Research Project. conducted at an HBCU together with PERICO Institute for Youth Development and Entrepreneurship, Inc. The community partner indicated the need for research on concerns expressed earlier by teens at the Jackson Public Schools (JPS). Relationship between suicide, depression and self-esteem was investigated in this study. Bullying was added as another variable, at PERICO's request as not only the students, but people nation-wide were concerned about rising reports d bullying in school. The choice of variables was also based on research

evidence: suicide is one of the leading causes of death among teens; it is the third leading cause with homicide and unintentional injury being the first two(Suite, 2007);and that poor teen self esteem can lead to emotional and mental issues (Stinson, Logel, Zanna, Holmes, et al., 2008). A 25 item survey questionnaire was developed and undergraduate students gathered data from 82 middle and high school students at the 2010 Teen Summit and in schools. Preliminary data analysis confirms that depression is positively correlated with bullying (r= .60) and with suicidal ideation (r=.49), bullying with suicidal ideation (r=.35), at the .05 level of confidence. Further students with high self-esteem report less depression and no suicidal tendencies and bullying is negatively correlated (r=.26), at the .01 level of confidence. These findings will result in a white paper making policy recommendation to the JPS system in order to recommend ways to assist at-risk-teens.

10:00 A.M. to 10:15 A.M. QUESTIONS AND ANSWER SESSION

10:15 BREAK

O11.05
10:30 SOCIOECONOMIC FACTORS INFLUENCING DISPARITIES IN IMMUNIZATION: A META-ANALYSIS OF NIS/NHIS STUDIES

Tiffany Trowles, Meherun Laiju
Tougaloo College, United States

Healthy People 2010 is a federal initiative started during the Clinton administration. Built on initiatives dating back to the 1970's, one of its longstanding goals is eliminating disparities in health. All of the initiatives aim to implement their objective of improving the health of American citizens into the daily routines of people, communities, and states. Healthy People 2010's goals are to improve the quality and years of healthy life of people in the U.S. as well as to eliminate disparities. One area in particular that Healthy People 2010 works to eliminate disparities is in the immunization rates of children. This research is a meta-analysis that examines socioeconomic factors that contribute to increasing or decreasing disparities in up-to-date immunization among children ages 19-35 months to find which factors are statistically significant. It focuses on studies that utilized data from the National Immunization Survey or the National Health Interview Survey and used a logistic regression to compare variables. This study finds that race, poverty level, mother's characteristics, and insurance status amongst other factors affected the disparities in immunization either positively or negatively. More research that includes various analyses such as in-depth interviews, as well as more attention to interaction effects should be done on the significant factors in the research examined in this meta-analysis in order to make changes that will one day eliminate the immunization disparity.

O11.06
10:45 RELATIONSHIP BETWEEN ATTITUDES TOWARD INTERCULTURAL SENSITIVITY, MULTICULTURALISM AND ETHNOCENTRISM AMONG COLLEGE STUDENTS

Telethia Rogers, Shaila Khan
Tougaloo College, United States

O.11.07
11:00 COLLEGE STUDENTS ATTITUDES ON THE MEDIA'S COVERAGE ON TERRORISM
Khorschuylar Williams, Shaila Khan
Tougaloo College, United States

O11.08
11:15 Risk Perception and Preparedness for Natural Disasters
Alyce Mack, Shaila Khan
Tougaloo College, United States

11:30 QUESTIONS AND ANSWER SESSION

11:45 BREAK

THURSDAY AFTERNOON

1:30 P.m. To 3:30 P.M. POSTER PRESENTATION Ballroom III (Third Floor)

P11.01
POSSIBLE INVOLVEMENT OF PRESYNAPTIC 5HT-1B AUTORECEPTOR IN THE LASTING NEUROBEHAVIORAL TERATOGENICITY OF EARLY SSRI EXPOSURE.
Rochelle Corbitt, Nidhi Khatri, Ian Paul
University of Mississippi Medical Center,

P11.02
INDIVIDUAL'S ROLE WITHIN A SPORT AND TEAM COHESION

Taylor Russolino, Melissa Lea, Jason O'Rear
Millsaps College, United States

Within the realm of athletics, there are several ways to gain a competitive advantage over your opponent. Sometimes it is not about who has the best athletes or coaches. As various studies have concluded, the aspect of team cohesiveness is an extremely vital part to a team's success. Team cohesion is a process by which the members of a team unify, and therefore work together in pursuit of their goals and objectives. In this research we tested the individual difference in cohesion based on role within the sport. The research was conducted in a NCAA Division III setting. All of the participants were current athletes at Millsaps College. Each participant completed a demographic questionnaire and then an 18-question Group Environment Questionnaire (GEQ). The GEQ directly measures team cohesion in terms of attraction and group integration. An independent t-test indicated that there were differences in perception of athletes team cohesion based on their role within the sport. Implications for coaches and players are discussed.

P11.03
WORKING MEMORY AND FOOD CRAVINGS FOR HEALTHY AND UNHEALTHY FOODS

Katie A Dennis, Melissa A Lea
Millsaps College, United States

Working memory is made up of one executive system and three slave systems: the phonological loop, episodic buffer, and visuospatial sketchpad. The executive system has limited resources to distribute to the three slave systems. Hence, working memory is limited in its capacity, the amount of resources it can allocate to different tasks. Previous studies have shown that food cravings for chocolate can limit working memory capacity. This study works to discover how healthy food cravings (i.e. oranges) differ from unhealthy food cravings (i.e. chocolate) in their limitation on working memory. Working memory was measured using the AOSPAN, a standard way to measure working memory capacity and use of the slave systems. It was found that the healthy cravings significantly limited working memory, where the unhealthy food cravings did not differ significantly from the control group. Specifically, it was shown that the phonological loop and visuospatial sketchpad are being limited by the healthy cravings. The implications of this study are that working memory is in fact limited by food cravings; however, the difference between healthy and unhealthy is still not understood. Future research will focus on what aspects of food (e.g. perception, memory) are the factors are work in the limiting of working memory.

P11.04
NEO FACET SCALE CORRELATES OF THE SNAP NARCISSISTIC PERSONALITY DISORDER SCALE

Emily Ladner, Nicole Blazek, Haley Cuevas, Randolph Arnau
University of Southern Mississippi, United States

Narcissistic Personality Disorder (NPD) is typified by a grandiose state of mind, excessive admiration-seeking, aloofness, and avoidance of intimate relationships. Previous research associated NPD with egotistical behavior, self-aggrandizment, and impulsivity, as well as lower levels of agreeableness, self-esteem, and empathy. The current study further investigates the relation of NPD, as measured by the Schedule for Nonadaptive and Adaptive Functioning (SNAP), and facets of the Five Factor Model personality traits, as measured by the NEO-Personality Inventory-R (NEO-PI-R). Participants were 133 undergraduate students from a Southern university (19 men and 114 women) ranging from ages 18 to 41 (mean age=20.48, SD =3.92) who completed the NEO-PI-R, SNAP, and Minnesota Multiphasic Personality Inventory-2 in a group setting in a paper and pencil format. Zero-order correlations were conducted to examine the associations between the SNAP NPD scale and facet scales of the NEO-PI-R. The results suggest that participants who show higher levels of narcissistic personality traits were more likely to exhibit higher levels of anger, vulnerability, and assertiveness and less likely to be straightforward and modest.

P11.05
THE EFFECTS OF TIME CONSTRAINTS ON REGRET Lauren Vucovich, Katie Macmillan, Kaitlin Short, Brittany Kinman
Millsaps College, United States

P11.06
NEO FACET SCALE CORRELATES OF THE MMPI-2 WORK INTERFERENCE SCALE

Brittani Plaisance, Nicole Blazek, Randolph Arnau
University of Southern Mississippi, United States

Work related problems include job burnout, stress, lack of cooperation, slacking on responsibilities, misunderstandings with coworkers, and/or low self-esteem. Poor performance in the work place has been previously associated with high levels of neuroticism and openness and with low levels of agreeableness, conscientiousness, and extraversion (Blanch & Aluja, 2008; Bolton, Becker, & Barber, 2001). The present study further explored the relation of work related problems, as measured by the work interference scale (WRK) of the Minnesota Multiphasic Personality Inventory 2 (MMPI-2), and Five Factor Personality Facets, as measured by the NEO-Personality Inventory-R (NEO-PI-R). Participants were 154 undergraduate students from a Southern university (23 men and 131 women) ranging from 18 to 41 years old (mean age=20.59, SD =4.05) who completed the NEO-PI-R, SNAP, and MMPI-2 in a group setting in a paper and pencil format. Zero-order correlations were conducted and revealed significant correlations between the WKR scale and a number of NEO facet subscales including Anxiety, Trust, Competence, Achievement Striving, Impulsivity, and Self-Discipline. These results suggest participants who endorse higher levels of inefficiency and low productivity in a work setting were more likely to be untrusting of coworkers, anxious, impulsive, show characteristics of depression and self-consciousness, and to have lower levels of self-discipline or competency.

P11.07
NEO FACET SCALE CORRELATES OF THE SNAP PARANOID PERSONALITY DISORDER SCALE

Haley Cuevas, Nicole Blazek, Emily Ladner, Randolph Arnau
University of Southern Mississippi, United States

Paranoid Personality Disorder (PPD) is characterized by habitual and unwarranted mistrust of other people and has previously been associated with neuroticism, low agreeableness, and negative emotions. The current study further investigates the relation of PPD, as measured by the Schedule for Nonadaptive and Adaptive Personality (SNAP), and the Five Factor Personality Facets, as measured by the NEO Personality Inventory Revised (NEO-PI-R). Participants were 133 undergraduates from a Southern university ranging from 18 to 41 years of age. Zero-order correlations were performed to examine the relation between the PPD scale of the SNAP and the facet scales of the NEO-PI-R. Results indicate that people with higher levels of paranoid personality traits were also more likely to have increased levels of anxiety, depression, and anger and lower levels of trust.

P11.08
DOES MATERNAL PSYCHOPATHOLOGY MEDIATE THE RELATION BETWEEN PARENTING EFFICACY AND CHILD DISRUPTIVE BEHAVIORS?

Laura Cook, Stephanie Smith, Tammy Barry
The University of Southern Mississippi, United States

Previous research demonstrates parenting efficacy—expectation of successful parenting—is inversely linked to parent and child maladjustment (Jones & Prinz, 2005). Understanding the complex interrelation between parenting variables is important to minimize child psychological symptoms. Because maternal distress (depression, anxiety/somatization) has been shown to uniquely predict child externalizing behaviors (Barry et al., 2005), it was hypothesized that these parental psychopathology variables would mediate the relation between parenting efficacy and child disruptive behavior. The current study included 56 families from a community sample. Parenting efficacy was significantly inversely related to child disruptive behavior outcomes (hyperactivity, r = -.30, p = .027, and aggression, r = -.43, p = .001), fulfilling the first step of mediation (Baron & Kenny, 1986), and to maternal psychopathology (i.e., the hypothesized mediator; depression, r = -.46, p < .001, and anxiety/somatization, r = -.39, p = .003), fulfilling the second step of mediation. When parenting efficacy and depression (or anxiety/somatization) were entered simultaneously to predict child hyperactivity and aggression, all four analyses indicated that the maternal psychopathology variable was still significant (βs ranged from .40 to .50, all ps < .05), whereas parenting efficacy was significant in only one of the four regression models, fulfilling steps three and four of mediation. Each Sobel test examining the reduction of the beta-weights for parenting efficacy was significant, indicating that

parental psychopathology mediated the relation between parenting efficacy and child disruptive behaviors. These findings support the theory that parental cognitions may impact children indirectly through changes in parental mood

P11.09
THE EXAMINATION OF CHILD NEUROPSYCHOLOGICAL FUNCTIONING AND PARENTING FACTORS AS UNIQUE PREDICTORS OF ADHD DIAGNOSIS AND SYMPTOM SEVERITY

Shea Becker, Lindsey Archer, Theodore Tomeny
Tammy Barry
USM, United States

The current study examined the relation of Attention-Deficit/Hyperactivity Disorder (ADHD) to child neuropsychological functioning, which is biologically-based and impaired among individuals with ADHD (e.g., Frazier et al., 2004) and to positive parenting and negative parenting behaviors, which are contextual factors linked to child disruptive behavior (Deault, 2010). A model with all three variables was used to predict ADHD severity (dimensional construct) and ADHD diagnosis (dichotomous construct). Neuropsychological testing data (NEPSY battery composite) were collected for 59 community sample children. Their parents and teachers completed ADHD DSM-IV Rating Scales, which were averaged to form an ADHD severity index. In addition, diagnostic information was collected, and children were coded as either having met a previous independent diagnosis of ADHD or not. Parents completed a parenting measure, yielding positive and negative parenting composites. A multiple regression analysis was used to predict ADHD severity, and a binary logistic regression analysis was used to predict ADHD diagnosis. Results indicated that the overall model considering all three variables simultaneously was significant for ADHD severity and diagnosis. Only neuropsychological functioning, $\beta = -.36$, $p = .002$, and negative parenting, $\beta = .37$, $p = .002$, contributed significant unique variance in the dimensional model, and only neuropsychological functioning, $B = -1.68$, $SE = .63$, $p = .007$, and positive parenting, $B = -1.68$, $SE = .80$, $p = .036$, contributed significant unique variance in the dichotomous model. These results underscore the importance of considering both sets of risk factors as predictors in the diagnosis and severity of ADHD.

P11.10
FRIENDSHIP PRESENCE ON THE PLAYGROUND AND ITS ASSOCIATION TO PHYSICAL ACTIVITY LEVEL: A PRESCHOOL SAMPLE

Kevin Karl, Lauren Flegle, Lauren Cox, Karen Christoff
University of Mississippi, United States

Child obesity rates have reached an all-time high in the United States with rates doubling over the past 30 years for children ages 2-5 (Institute of Medicine of the National Academies, 2004). This has led to increased research into understanding the causes of this swell and how to combat its rise. The literature shows that several key variables, including child physical activity level, parent physical activity level, and peer influences on the playground are related to childhood obesity (Epstein, 2005; Trost, et al., 2003; Salvy, 2008). Much of this research however has been on samples that are past the key age range for effective early intervention. As such, groundwork must be laid to discover if these relations occur in younger samples. The current study attempted to find whether the presence of friends on the playground increases the physical activity level of a preschool sample. Sociometric interviews were conducted in order to understand the peer influences at work and playground observations were utilized throughout to determine which children are physically more or less active, to measure any increase or decrease in level of physical activity, and whether or not play is occurring in the presence of friends. Results found no significant relation between level of physical activity and friendship presence on the playground however. Possible explanations and implications for further research were discussed.

P11.11
BELIEFS ABOUT OBESITY

Lauren Cox, Karen Christoff
University of Mississippi, United States

During the early part of the decade, little attention was paid to the topic of obesity (Kersh & Marone, 2005). In fact, very few Americans considered it to be a serious public health concern (Schlesinger, 2005). Recently, this topic has garnered much attention in the media resulting in concern and a shift in the public perception of obesity (Schlesinger, 2005). Our study was designed to assess general beliefs about obesity.

The participant sample consisted of undergraduates enrolled in classes within the Psychology Department at a major university in Mississippi. Participants included 59 females and 41 males ranging in age from 18 to 24 years old. Each participant completed a survey packet containing questions concerning their beliefs about obesity.It was found that 33 % agree or strongly agree that a school nurse should monitor a child's weight. 71% believed that should a school nurse consider a child to be overweight, the nurse should inform the child's parents. 48% felt that it is the family doctor's responsibility to monitor the child's weight. 82% believe that once a parent has been informed that their child is overweight, they should be provided with information on how to help reduce their child's body weight. 81% consider obesity in children and adolescents to be a serious health concern. This information allows more understanding of obesity as a public health problem. Data suggests that people are more cognizant of and willing take action to reduce obesity.

P11.12
THE INTERACTION BETWEEN ADHD SYMPTOM SEVERITY AND EXECUTIVE DYSFUNCTION IN THE PREDICTION OF UNDERACHIEVEMENT IN READING AMONG SCHOOL-AGED CHILDREN

Caitlin Winstead, LaKenya DeBerry, Sarah Davis, Tammy Barry
University of Southern Mississippi, United States

Both executive dysfunction and a diagnosis of Attention-Deficit/Hyperactivity Disorder (ADHD) have been linked to academic underachievement (e.g., Barry et al., 2002). However, few studies have considered a multiplicative risk model (Daley & Birchwood, 2010). For the current study, it was hypothesized that ADHD severity and executive dysfunction would uniquely predict reading underachievement and would interact such that higher levels of each would be associated with the greatest underachievement. Participants were 85 children (54% male, mean age of 11 years)—36 with ADHD and 49 non-ADHD. Children were tested on an executive functioning battery—used to form an executive dysfunction composite—and an IQ test and reading achievement battery—used to determine academic underachievement (i.e., grade-based actual achievement lower than predicted achievement based on IQ). Parents completed an ADHD DSM-IV Rating Scale, Behavioral Assessment System for Children and a home situations impairment measure—used to form an ADHD severity index. A moderated multiple regression analysis was conducted and indicated that, when entered simultaneously, ADHD severity, $\beta = -.31$, $p = .003$, executive dysfunction, $\beta = -.51$, $p = .002$, and the interaction, $\beta = -.32$, $p = .044$, all significantly predicted reading underachievement. A post-hoc plot of the interaction indicated that the greatest reading underachievement was among those children high in both executive dysfunction and ADHD severity, $B = -12.01$, $t = -2.05$, $p = .044$. This finding underscores the importance of intervening with both cognitive and behavioral deficits when targeting academic outcomes in children, especially those with ADHD.

P.11.13
SOCIAL RELATIONSHIPS OF CHILDREN WITH DISABILITIES IN INCLUSIVE CLASSROOMS: COMPARISONS TO THEIR TYPICAL PEERS

Lauren Flegle, Kevin Karl, Karen Christoff
University of Mississippi, United States

Educating children with disabilities in inclusive classrooms has been the norm since the last part of the twentieth century, and was initiated with the hope of creating learning communities that involved children with and without disabilities (Ferguson, 1996). The current study sought to examine the sociometric nominations of children with disabilities presently enrolled in inclusive classrooms and to compare these children to their typical peers on a number of different variables. Data were collected from 77 children (19 of whom had disabilities) in inclusive classrooms in the first through fifth grades. The participants were asked to nominate classmates for the following categories: "like most," "like least," "like to work with," "like to play with," "good at schoolwork," "not good at schoolwork," "popular," and "different." Independent sample t-tests compared the percentage of nominations received by typical children to those of children with disabilities and found that children with disabilities were nominated significantly more for "not good at schoolwork" and "different," but nominated significantly less for "good at schoolwork," "like to work with" and "popular" ($p < .05$, Cohen's $d > .5$ in all cases). There were no differences in the percentage of nominations the two groups received in the other categories. Results are discussed in terms of what the inclusive environment has been like for children with disabilities since its

inception, with emphasis on research that focuses on peer acceptance and sociometric nominations.

P11.14
ON THE EFFECTS OF NONCALORIC SWEETENERS ON THE WEIGHT OF RATS

A.K. Thaw, Nathaniel Mann
Millsaps College, United States

Research examining the effects of sugar substitutes on body weight has led to conflicting results. Some studies find that sugar substitutes can lead to a delayed response of excess food intake, while others find negligible effects or even weight loss when alternatives to sugar are used as sweeteners. One common procedure is to offer rats ad. lib food, water and supplement with artificial sweeteners. We reasoned that allowing ad lib food access may inadvertently be masking the effects of the sweeteners. Thus, we examined the effects of Sucralose on body weight while holding the amount of food constant. We hypothesized that when food intake is held constant, rats who receive artificial sweeteners will gain more weight than the controls. - 24 male Sprague-Dawley rats were used as subjects. Group 1 (N=3) received ad libitum access to food while groups 2(N=3), 3 (N=6) and 4 (N=6) received only 90% of their mean food intake daily, to ensure that all rats finished their food. Group 3's water was replaced with a Sucralose solution and group 4's water was replaced with sugar water for part of the day. At 17:00 hours the water bottles were refilled with water (and the food replaced). The ad libitum fed rats gained the most weight as expected. The Sucralose and the Sugar water groups both gained similar amounts of weight and both gained more weight than group 2 (restricted food control). We conclude that physiological effects associated with Sucralose contribute to excess weight gain in food restricted rats.

P11.11
ROLE OF SELF ESTEEM AND SUICIDE IDEATION AMONG AFRICAN AMERICAN COLLEGE STUDENTS

Earnest Ducksworth, Madhu Singh
Tougaloo College, United States

P11.16
SCHOOL'S RACIAL COMPOSITION: STRESS,SELF-ESTEEM AND SOCIAL SUPPORT OF AFRICAN AMERICAN STUDENTS

Danielle Foster, Madhu Singh
Tougaloo College, United States

P11.17
COLOR OF IMPLICIT LEARNING

Ashley Hence, Madhu Singh
Tougaloo College, United States

P11.18
EFFECT OF CELL PHONE USAGE UPON ENVIRONMENTAL CHANGE DETECTION

Alexis Thomas, Madhu Singh
Tougaloo College, United States

P11.19
CHANGING VIEWS: SPIRITUALITY AND COPING STYLES OF AFRICAN AMERICANS

Rashida Wilson, Madhu Singh
Tougaloo College, United States

P11.20
THE RELATIONSHIP BETWEEN PENDING LAYOFFS AND THE PSYCHOLOGICAL WELL-BEING OF THE WORKERS

Carla Coleman, Meherun Laiju
Tougaloo College, United States

P11.21
WEIGHT, BODY IMAGE, AND SELF-ESTEEM: A COMPARISON OF AFRICAN-AMERICAN AND CAUCASIAN FEMALE COLLEGE STUDENTS

Telethia Rogers, Karen Christoff, Shaila Khan
Tougaloo College, United States

The eating disorder bulimia was first recognized as a clinical problem in 1980 (Diagnostic and Statistical Manual of Mental Disorders, DSM-III; American Psychiatric Association, 1980) (Katzman and Wolchik,, 1984). Its diagnostic features include episodic binge eating followed by depressed mood, self- induced purging or restrictive dieting, and awareness that this eating is abnormal (Katzman and Wolchik, 1984). The present study investigated several factors presumed to be involved in attributions of beauty, those related to weight and self-esteem in African-American and Caucasian female undergraduate students. A sample of 76

female students completed anonymous surveys which contained demographic information as well as ratings of usual and desired self on Body Image Silhouettes, the Eating Attitudes Test and the Rosenberg Self-Esteem Scale. African American women were found to have higher BMI scores than did Caucasian women ($p<.001$). African American women also rated themselves as heavier on the silhouettes than did Caucasian women ($p<.001$). While both races wanted to be slimmer, African-American women rated their ideal silhouette as heavier than did Caucasian women ($p<.001$). There were no significant differences on EAT or Rosenberg scores. However, for both races, bigger discrepancies between rating of 'usual' weight and rating of 'desired' weight were correlated with higher scores on the EAT ($r = .361$; $p = .001$), and lower self-esteem as measured by the Rosenberg ($r=-.341$, $p=.003$).

P11.22
PARENTAL RELATIONSHIP AND ITS EFFECT ON COLLEGE STUDENTS' ROMANTIC RELATIONSHIP

Sontonjia hall, Shaila khan
Tougaloo College, United States

P11.23
ATTITUDES TOWARD TERRORISM AMONG COLLEGE STUDENTS

Natalie Woods, Shaila Khan
Tougaloo College, United States

P11.24
THE MEDIA INFLUENCE ON AFRICAN AMERICAN WOMEN'S BODY IMAGE

Ashleigh Quinn, Shaila Khan
Tougaloo College, United States

Body image is a term which refers to the perceptions of a human's own physical appearance, or the internal sense of having a body which is interpreted by the brain. In many cases, this can be dramatically different from how they actually appear to others. The purpose of this study is to test whether there is a relationship between the media and African American women's body image. To study this, a convenience sample was used for collecting data from eighty participants from an historically black college. It was hypothesized that there would be a positive relationship between prolonged hours of media watching and the body image, body satisfaction, and body mass index of the African American women. The independent variable in this study was media hours and the dependent variable was the score on the body image questionnaire, body satisfaction questionnaire and the body mass index. In order to test the hypothesis about the relationship between media and body image, body satisfaction and body mass index a correlation was conducted with the body image questionnaire, body satisfaction questionnaire, body mass index, media per day, media per week, and idealized images. There were no significant correlations found between media and body image ($r=.081$, $p=.10$), between media and body satisfaction ($r=-.016$, $p=.08$), between media and body mass index ($r=.103$, $p=.17$). From the results it may be concluded that amount of media watched by the participants does not effect their body image, body satisfaction and body mass index.

P11.25
ATTITUDES AND BELIEF OF OBESITY AMONG YOUNG ADULTS AND OLDER ADULTS

Jerrica Davis, Shaila Khan
Tougaloo College, United States

The purpose of the present study was to examine the attitudes and beliefs of obesity among young adults and older adults. The Obese Persons Scale (ATOP; Allison, Basile, and Yuker, 1991) and the Beliefs about Obese People Scale (BAOP; Allison, Basile, and Yuker, 1991) were administered to 40 young adults and 40 older adults. It was hypothesized that: 1) older adults will have a more positive attitude toward obese persons compared to younger adults; 2) older adults will have a stronger belief that obesity is not under the obese persons control compared to younger adults; 3) there will be gender differences in attitudes toward obese persons; 4) there will be gender differences toward belief that obesity is not under the obese persons control; and 5) attitude toward obese persons and belief that obesity is not under the obese persons control will vary according to different BMI groups, and employment status. The results showed that older adults and younger adults did not differ in their attitude toward obese persons. It was found that older adults had a stronger belief that obesity is not under the obese person's control. The third and fourth hypotheses were rejected as no gender difference toward attitudes toward obese persons and belief that obesity is not under the obese persons' control was reported. Fifth, the hypothesis was accepted as the ANOVA test revealed that BMI group significantly varied in

their attitude toward obese persons and belief that obesity is not under the obese person's control.

P11.26
THE PERCEPTION OF HEALTH AMONG MALE AND FEMALE COLLEGE STUDENTS

Shania Morris, Shaila Khan
Tougaloo College, United States

Health is defined as the absence of disease, mental, and physical problems, the overall condition of an organism at a given time, and the condition of well being. The purpose of this study was to see how male and female college students perceive their health. It was hypothesized that the perception of health would differ according to gender, age, and diet habits, health condition, exercise, and medical condition. The study consisted of eighty participants, forty male and forty female. Ten t-tests were performed with ten subscales of the Perception of Health Scale. Only one of these was significant. The t-test showed that males' perception of Health Status (M = 16.15;SD = 1.79) was better than females perception of Health Status (M = 15.07;SD = 1.86) and was found to be statistically significant with t(78)=2.63,p=.010. To test the hypothesis that perception of health differs according to age ten t-tests were performed with ten subscales of Perception of Health. On a perception of Health Image that (M =20.56 ;SD = 2.77) was higher compared to age group between 18-22 (M = 18.67;SD = 4.59) and this difference was statistically significant, t(78)=-2.27,p=.026. Perceptions of health did not vary according to people diet habits, health condition, exercise and other medical condition.

P11.27
MENTAL HEALTH, PHYSICAL HEALTH AND STRESS: A STUDY AMONG AFRICAN AMERICAN COLLEGE STUDENTS

Zellessia Sherrod, Shaila Khan
Tougaloo College, United States

Stress is the body's reaction to a change that requires a physical, mental or emotional adjustment or response. Besides mental health, stress can affect a person physically and have an effect on their immune system. All college students' deal with stress because of course load and the demand associated with course work. Students' immune systems often weaken during exam periods. Lowered immunity explains the increased likelihood of illness during periods of stress. The objective of this study was to examine the relationship between African American college students' perceived stress and their physical health. Perceived Stress Scale and Physical Health Scale questionnaires were administered to 80 African American males and females, ranging from age 18-23. It was hypothesized that there would be a negative correlation between the amount of stress and the physical health of the participants. It was also hypothesized that there would be a significant difference on the two scales according to gender, employment, housing, and classification. Pearson's correlation revealed that there was a significant relationship between stress and physical health (r=.442, p=.01). T-test results showed that females had higher levels of perceived stress (M=19.33, SD=5.729) than males (M=15.206, SD=6.067, t (78) =-3.031, p=.003). Females also showed higher levels of health problems (M=10.039, SD=5.1728) than males (M=7.5517, SD=5.1708, t (78) =-1.991, p=.050). It may be concluded that stress and physical health are correlated and females are more vulnerable towards perceived stress and also have higher health problems.

P11.28
PERCEIVED STRESS IN RELATION TO LOCUS OF CONTROL AMONG COLLEGE STUDENTS

Khrysthal Fountain, Shaila Khan
Tougaloo College, United States

Locus of control has been defined as an organism's belief that his or her situational outcomes are determined by the actions that have personally been taken or by others' effect on the outcome; it may be either internal, in which the person attributes successes and failures to what they have done, or are doing to achieve a goal, or external, where a person credits any accomplishments or disappointments to anything that is beyond his/her control (Schultz & Shultz, 2005). Perceived stress is the psychological response of an individual to a potential stressor (Barlow & Durand, 2005). This study sought to determine whether the locus of control of college students has an effect on their perceived stress. It was hypothesized that those students with internal locus of control would have higher levels of perceived stress than those with external locus of control. It was also hypothesized that the age, gender, classification, and employment status would have an effect on the participants' perceived stress level. There were 80 college students that participated in the study. The questionnaires used for classification, race, and employment status were a Locus of Control scale

(Nowicki & Strickland, 1973), and a Perceived Stress Scale (MacArthur & MacArthur, 1999). The mean perceived stress of external locus of control students was higher (Mean=7.6. SD=6.48) compared to internal locus of control students (Mean=13.43, SD=6.48). These results indicate that those with external locus of control have higher levels of perceived stress than those with internal locus of control (t(78)=-2.795, p<.007.

P11.29
OCCUPATIONAL AND PERCEIVED STRESS AMONG EMPLOYEEES IN AN INSTITUTION FOR MENTALLY CHALLENGED INDIVIDUALS COMPARED TO OTHER HEALTH RELATED FIELDS

Kristi Kirkwood, Shaila Khan
Tougaloo College, United States

The purpose of this study was to examine how high stress within individuals working in institutions for mentally challenged persons and other health-related fields, such as a hospital. It was hypothesized that occupational and perceived stress among individuals working in institutions for mentally challenged persons will be higher than stress among individuals working in a hospital setting. It was also hypothesized that occupational and perceived stress will vary according to gender, number of children, and number of hours worked. The hypothesis that occupational stress would be higher in individuals working in an institution for mentally challenged persons was found to be statistically significant (t (78) = 2.23, p= .03). The hypothesis that perceived stress would be higher in individuals working in an institution for mentally challenged persons was not statistically significant with (t (78) =.25, p=.80). Individuals with more than one child had higher levels of perceived stress. The number of children and its effect on perceived stress was statistically significant (t (78) = -2.65, p<01). Employees working 20-25 a week showed significantly higher levels of perceived stress compared to employees working less hours (t(78) = 1.94, p=.05). Though perceived stress was higher among females and occupational stress higher among males but the difference was not statistically significant. This study along with others indicates that stress affects an individual's life on and off the job. Employees and employers should implement stress management techniques to help control stress.

P11.30
ALCOHOL PROBLEMS AND AGGRESSION AMONMG AFRICAN AMERICAN MALE COLLEGE STUDENTS

Leo Williams, Shaila Khan
Tougaloo College, United States

College students who drink alcohol are more likely to have trouble with the law and to get hurt or injured than non-drinking college students (Ausherman, 2006). People who drink alcohol are more likely to engage in high-risk sexual behavior, have poor grades or job performance, use tobacco products, and experiment with illegal drugs (DePyssler, Williams & Windle, 2002). Aggression is directly linked to alcohol. Verbal abuse, striking someone physically, and hostile destructive behaviors are a few examples of aggression. Studies have suggested that aggression and alcohol are directly correlated, but that alcohol may be used intentionally to promote or excuse the violent consequences of drinking (Welte, Wieczorek & Zhang, 2002). The purpose of the present study was to investigate the relationship between aggression and alcohol problems among African American male college students. It was hypothesized that participants who score high on the aggression scale will show more alcohol problems compared to participants who have lower score in aggression scale. The aggression scale (Buss & Perry, 199X) and the Young Adult Alcohol Problems Screening Test (YAAPST: Hurlbut & Sher, 1992), was administered to 80 male college students. The results showed that physical aggression (r=.605, p<.01), verbal aggression (r=.497, p<.01), anger (r=.575, p<.01) and hostility (r=.465, p<.01) were all positively correlated with alcohol. Overall aggression also showed significant positive correlation with alcohol (r=.595,p<.01). These results suggest that African American male college students who have alcohol problems also tend to engage themselves in some form of aggressive behavior.

P11.31
THE RELATIONSHIP BETWEEN PERSONALITY TYPES AND TEXT MESSAGING

Marissa Carter, Shaila Khan
Tougaloo College, United States

The purpose of this research was to examine the relationship between introverted and extraverted personality types and the use of SMS, or text

messaging. A personality type questionnaire and the short message service-problem used a diagnostic (SMS-PUDQ) questionnaire, which was administered to 80 college students. The SMS survey scores measure two areas, problem and pathological use. It was hypothesized that introverts and females would score higher on the problematic and pathological use of SMS compared to extroverts and males. The results showed that extroverts had higher means for problematic use of SMS (M= 12.51, SD=3.58) compared to introverts (M= 10.25, SD= 4; t=-2.44, p=.01). The difference between introverts and extroverts for pathological use was not significant (t=-1.13, p=.26). The results showed that females scored significantly higher in problem use of SMS (M= 12.58, SD=3.51) compared to males (M= 10.51, SD=4.32; t (78) = -2.44, p=.02), but for pathological use of SMS the gender difference was not significant (t=-.98, p=.32). This research may have implications in the recognition of SMS, and other forms of information and communications technology (ICT), as an addiction. Results of this research may provide insight into measures to prevent texting from becoming a distraction and destroying face to face communication, and also identify individuals who are at a greater risk for problematic use of texting, or texting addiction. This information may enable us to isolate the negative effects of computer-based communication and keep them to a minimum while maximizing positive effects.

February 18, 2011

FRIDAY MORNING
Room 218A

O11.09
9:00 THE ROLE OF THE PSYCHOLOGIST IN MILITARY INTERROGATIONS

Robert Boyer, Sheree Watson
University of Southern Mississippi, United States

The psychologist's role in military interrogations has become increasingly important since the September 11, 2001 attacks on the World Trade Center. The psychologists' abilities have been in great demand because of their expertise in the areas of terrorist behavior and vulnerability. It is imperative that psychologists have a role when creating a curriculum in which the goal is to extract information from another human being. In addition, the psychologists' skills in shaping the local population's understanding and cooperation have been sorely needed in a war against opponents whose culture and values are so different from those of mainstream America. In this presentation, we describe the role of the psychologist in the military services, with a particular emphasis on the psychologist's role in the training and implementation of interrogation

O11.10
9:15 TYMPANIC MEMBRANE TEMPERATURE INCREASES IN RESPONSE TO RESTRAINT STRESS

David Hanbury[1], Kyle Edens[1], Claire Legg[1], Babette Fontenot[2], Sheree Watson[1]
[1]*University of Southern Mississippi, United States,*
[2]*New Iberia Research Center, University of Louisiana, United States*

Measures of tympanic membrane temperature (TMT) may be a cost-effective alternative to PET and fMRI to indirectly measure ipsilateral hemispheric activity. The current study examined TMT in response to capture and restraint in eight captive bushbabies (*Otolemur garnettii*). The subjects were tested in each of two conditions. In one condition, the TMT measurement procedure was reinforced with banana and loosening of restraint, whereas in the other condition no reinforcement was administered. In each condition, temperature measurements were taken in six bilateral trials with an intertrial interval of two minutes between each measurement set. Subjects were exposed to only one condition per testing day and order of condition assignment was counterbalanced. Data were analyzed using a 2 (reinforcement) x 2 (ear) x 6 (time) repeated measures ANCOVA with age as a covariate. There was no main effect of reinforcement, $F(1,6)=.03$, $p=.86$. However, there was a significant main effect of time $F(5,30)=10.65$, $p<.001$, with temperature increasing as number of trials increased. There was also a significant covariate effect of age, $F(1,6)=19.28$, $p=.005$, with younger bushbabies showing higher temperatures than older bushbabies. Although reinforcement did not appear to ameliorate the effects of stress, these data are consistent with literature suggesting that bilaterally higher TMTs are associated with fearfulness and negative affectivity. These results also have implications for husbandry procedures as handling time appears to be associated with increased temperature.

O11.11
9:30 CHANGES IN HEALTH PATTERNS WITH EUROPEAN CONTACT: AN ANALYSIS OF ENAMEL HYPOPLASIAS OF THE COLONIAL MAYA AT TIPU

Amanda Harvey
The University of Southern Mississippi, United States

Located in western Belize, the Colonial site of Tipu was occupied from 1541-1704. This contact site consists of a Spanish missionary church and a cemetery of 588 interments. In order to investigate health changes associated with Europeans contact, enamel hypoplasias are used to explore growth disruptions resulting from nonspecific physiological stress. Standard methods of scoring (Buikstra and Ubelaker 1994) were employed to assess frequency, severity, color, and type of episode in the permanent anterior dentition. For analysis, the population is considered for differences by tooth type, sex, and the individuals were placed into age groups of 6-17, 18-35, 36-50, and 51+ years. Results showed a mean of 1.28 hypoplasias per tooth with canines averaging more episodes than incisors and maxillary teeth more than mandibular. Over 90% of recorded episodes were of mild severity. No differences in patterns of severity by sex were found. However, juveniles demonstrated a higher frequency of moderate and severe hypoplasias. Females displayed approximately 0.33 more lesions per tooth than did males, and those dying as juveniles had only slightly more episodes than those surviving to adulthood. Mean age at formation was consistent across sex and age groups with most forming from 0-3 years on incisors and 4-6 years on canines. These data suggest that overall the population at Tipu was relativity healthy despite European contact. Other indicators, such as anemia and infection also reflected low frequencies within the population. Similarly, they do not reflect extensive presence of epidemic disease, instead showing adaptation despite notable culture change.

O11.12
9:45 DENTAL MICROWEAR AND DIET CHANGE DURING THE GREEK BRONZE AND IORN AGE IN COASTAL EAST LOKRIS, GREECE.

J. Rocco de Gregory
Mississippi State University Department of Anthropology & Middle Eastern Cultures

This research is a preliminary study investigating diachronic diet change at two sites during the Bronze Age (BA) and Iron Age (IA) in East Lokris, Greece. The examination of microscopic dental surface features, created by the chewing of food, known as dental micro wear analysis (DMA), has shown promise in addressing questions concerning subsistence change among extinct and extant species. The Greek BA and IA are some of the most studied periods in western history, yet little DMA research focusing on this time period has been published. The sites of Mitrou and Tragana Agia Triada are used because together they span the transition from BA to IA. Mitrou is a small island in the bay of Atalanti. Survey and excavation on the island has shown that the occupation extend from the Neolithic period to the Classic Period. Excavations have recovered 75 burials ranging in age from the Early Helladic to the Protogeometric periods. Tragana Agia Triada consists of nine Late Helladic Mycenaean chamber tombs located 3 km southwest of Mitrou. Due to the geographic and temporal proximity of the sites it is believed that they are associated. Selected adult second molars from both sites were replicated and imaged using a scanning electron microscope. Micro wear 4.0, software developed for DMA, was used to quantify the micro wear features. Changes in dental micro wear feature frequencies and orientation may indicate dietary shifts. Results from the micro wear analysis will be compared to the oral health and archaeological data to assess temporal and demographic differences.

10:00 QUESTIONS AND ANSWER SESSION

10:15 BREAK

O11.13
10:30 ANALYSIS OF FEMORAL ROBUSTICITY AT MORTON SHELL MOUND: A PRELIMINARY STUDY

Sarah Zaleski, Nicholas Herrmann
Mississippi State University, United States

A re-analysis of the human skeletal collection from Morton Shell Mound (16IB3) is currently underway. The mound was excavated from 1969 to 1973, and Louise Robbins completed the initial skeletal analysis in 1976. She reported a minimum of 275 individuals among the 24,900 human bone fragments, and noted a high frequency of an endosteal, yawslike pathology. There is also

marked robusticity in the ribs, long bones, and skull fragments. The current study will analyze intra-group variation in femur robusticity. Cross-section analysis will be completed of fortuitous breaks in the femoral midshaft. Digital pictures will be taken of the cross-sections, and ImageJ software will be used to calculate biomechanical moments and cortical area measurements. This is a preliminary study and includes only a subsample of excavation units. Nevertheless, this analysis has the potential to provide a more complete understanding of the health, mobility patterns, and activity levels of the Morton collection. Robust bones indicate high activity levels and likely greater mobility. Less robust bones suggest lower activity levels and/or malnutrition. There is a relationship between high robusticity, osteoarthritis, and high levels of pathology, all of which result from the same behavioral pattern. Therefore, notes on the presence and degree of osteoarthritis and other pathologies will be made for the femora measured, and any correlations with robusticity will be reported. This study's results will be compared to robusticity analyses of collections from Florida, the Middle Tennessee Valley, and Plash Island, AL to illuminate regional variation in the Southeast.

O11.14
10:45 ASSESSMENT OF MINIMUM NUMBER OF INDIVIDUALS AT THE MORTON SHELL MOUND OSSUARY

Jessica Stanton
Mississippi State University, United States

Determining the minimum number of individuals (MNI) is a crucial step in bioarchaeological investigations of commingled human remains. Although several methods are available to derive MNI, nearly all approaches are based on observed bone segments. Highly fragmented remains pose a methodological challenge for bioarchaeologists because of the high diversity in fragment morphology. The Morton Shell Mound site (16IB3), a multi-component, Woodland to Mississippian period site on the Louisiana coast, exhibits such challenges because of the high levels of fragmentation and commingling. Although an osteological report was prepared for Morton Shell Mound in which a MNI of 275 was derived from a sample of approximately 24,900 fragments, our preliminary analysis suggests that the total fragment count is underestimated, raising questions about the original MNI estimate. The current study is underway to reassess MNI at Morton Shell Mound based on femora fragments. Two methods of dealing with highly fragmented cremains developed for the analysis of the Walker Noe crematory site (15GD56) are employed to document Morton. The first method uses a landmark-based inventory approach incorporating traditional and non-traditional osteological features and the second is a Geographic Information System (GIS) based approach using the spatial overlap of identified fragments. After refitting all possible fragments within and across units, they will be assessed for predetermined landmarks, and any placeable fragment will be digitized into the bone GIS. Preliminary results of this MNI analysis as well as the applicability of these methods to the analysis of the Morton Shell Mound mortuary program will be reviewed.

O11.15
11:00 THE EFFECT OF URBAN MIGRATION ON DISEASE FREQUENCY IN RECONSTRUCTION-ERA NATCHEZ

Nicole Musselwhite
University of Southern Mississippi, United States

This presentation uses epidemiological evidence to evaluate the effects of urban migration of newly- freed slaves on disease prevalence in Natchez. During the Civil War and the years following, Natchez experienced demographic upheaval as African-Americans descended on the city proper from plantations nearby. Theoretically, living on a plantation would have limited both population mobility and exposure to infectious diseases associated with urban areas. Thus, it would be expected that the rural-urban migration would have exposed these individuals to new diseases, which would be reflected in mortality patterns. Using the sexton records of the Natchez City Cemetery, information on more than 3500 deaths between 1850 and 1898 were analyzed to examine disease specific frequencies over five year increments. Seven diseases or symptoms were investigated: Smallpox, Measles, Yellow Fever, Malaria, Whooping Cough, Tuberculosis, and general congestion. Surprisingly, Natchez's Black population did not generally see significant changes rates of the aforementioned conditions, except for Tuberculosis and general congestion. Additionally, while a spike occurred in 1870-1875 among all the diseases analyzed, the prevalence rates subsided afterwards with the exception of Tuberculosis and general congestion. Mortalities due to Tuberculosis and general congestion did see an increase of approximately 9% in the 23 years following the Civil War, but declined after 1887. Therefore, the urban migration of Negro

individuals did not have a significant effect on infectious disease mortality frequency in Reconstruction-era Natchez, possibly due to natural immunity to some diseases or that plantations did see more exposure to urban, infectious diseases than previously thought probable

O11.16
11:15 LINEAR ENAMEL HYPOPLASIA ANAYLSIS OF SHADY GROVE MOUND SITE (22QU525).

Tyler Cargill
The University Of Southern Mississippi, United States

This paper is to assess the effects of the transition to agriculture on the health of a prehistoric population using dental growth disruption markers. The adoption of maize agriculture generally resulted in increased sickness and growth arrest due to a less varied diet and more infectious diseases. Time between births also decrease. To look at this issue, I examined the skeletal sample from Shady Grove (22QU525), a Mississippian period chiefdom, located in Quitman County, Mississippi and dating to circa 1200 AD when maize was first incorporated into the diet. Linear Enamel Hypoplasias (LEHs), a developmental defect appearing as furrows on the crown, were examined. Incisors and canines from 31 individuals were evaluated, noting frequency and severity of each defect. Using location on the tooth, age at formation was determined to indicate weaning stress. Among incisors, over 90% showed episodes with a mean of 1.9 per tooth. Most LEHs formed at 2.5 years of age. Among canines, one-third had lesions with a mean of 1.5 per tooth. Mean age at formation was slightly older at 3.4 years of age. These hypoplasias frequencies are much higher than those seen at Magnum (22CB584), a Late Mississippian site at which there had been greater time for adaptation to agriculture. Penton (1985) found most LEH developed between after 2-5 years of age, indicating no change in birth spacing; however 17% incisors and canines had defects. This suggests that the transition to agriculture was more stressful at Shady Grove. Other archaeological information is discussed in support.

11:30 QUESTIONS AND ANSWER SESSION

11:45 BREAK

FRIDAY AFTERNOON
Room 218A

O11.17
1:30 ATTEMPTING TO BYPASS THE BIASES: AN EVALUATION OF THREE MISSISSIPPIAN PERIOD POPULATIONS

Christopher Davis
University of Southern Mississippi, United States

This study will focus on Musculoskeletal markers (MSM's) of the lower limbs in an attempt to look beyond the biases of age and sex by incorporating new methods, such as robusticity and subtrochantic morphology, to aid in the interpretation of mobility levels and habitual activity patterns. According to Wolff's Law, bone is produced where it is needed and absorbed where it is not. Musculoskeletal markers (MSM's) are bony reactions located where muscles attach, and they are commonly applied in the reconstruction of mobility levels and habitual activity patterns; however, there are many biases such as age, sex, and body size that have caused inaccuracies making interpretation problematic. Use of robusticity, and overall bone strength, has been employed in multiple studies addressing mechanical loading along with labor and mobility behavior, while subtrochantic morphology has been applied while interpreting levels of mobility.This study analyzes these variables in femora from over 50 individuals from three Mississippian period sites: Shady Grove (22QU525), Austin (22TU549) and Womack (22YA500). Analysis integrates data from 13 MSM sites on the femur and 7 on the tibia, as well as osteometric and morphological observations. Preliminary results indicate that there is some correlation between robusticity, subtrochantic morphology and the linea aspera, a major MSM that runs the length of the femoral diaphysis. Other markers show more mixed patterns of associations. These findings may be able to provide a new approach to overcoming some of the biases that have become problematic when assessing MSMs.

O11.18
1:45 THE MEASURE OF A MAN: A COMPARISON OF STATURE FORMULAE FOR THE BIOARCHAOLOGICAL RECORD

Jeffrey Auerbach
University of Southern Mississippi, United States

This paper will examine methods for calculating stature in prehistoric North American populations. One of the most commonly evaluated and widely debated health indicators is stature. Stature is viewed as the summation of childhood nutrition minus the demands of labor and disease; this allows it to be used as a marker of the nutritional health of a population. Stature estimation for New World populations, however, has been complicated because of the lack of an appropriate stature formulation until very recently. This analysis will investigate the efficacy of these new formulae specific to North American populations living in temperate regions (Auerbach and Ruff 2010) using a case study. The case study examines the skeletal remains from a Late Woodland era site from the Gainesville Lake area of Western Alabama. Of 86 individuals present, 7 males and 4 females had complete femurs; six had complete tibias analysis. Stature was then calculated using formulae of Auerbach and Ruff (2010) as well as using other common formulae, namely Genoves (1967), Sciulli and Geissen (1993), and Trotter and Glesser(1952). Significantly, when the results of these various methods for stature are compared, the results differ. The Auerbach and Ruff formula resulted in consistently taller estimates, those of Sciulli and Geissen were always several centimeters shorter than the rest. The femoral formulae for Trotter Gleser gave shorter estimations than did their tibial formulae. These findings suggest that stature calculation can vary widely, and it is important that a consistent set of formulae is used across studies.

O11.19
2:00 ASSESSMENT OF HEALTH PATTERNS AT SHADY GROVE (22QU525), AN EARLY MISSISSIPPIAN SITE, USING LONG BONE DIMENSIONS

Susan Oubre
University of Southern Mississippi, United States

Bone morphology reveals much about the health status of a population, especially level of protein adequacy; sex differences are particularly informative since males are generally more adversely affected by stress. This study examined skeletal dimensions in a prehistoric Native American population undergoing transition to maize agriculture, which has been associated with a decline in health due to a less varied diet and greater infectious disease. The human remains were recovered at Shady Grove, a Delta mound site dating to the Mississippian Period (AD 1100-1400). Standard dimensions were taken on 35 femurs and 25 tibiae. Stature was estimated using formulae by Auerbach and Ruff (2010). Dimorphism was calculated as mean female to male height ratio. Mean male stature was 164.59 cm. This is comparable to results of males at Lake George, another Early Mississippian site, but 5.19 cm shorter than males at Mangum, a Late Mississippian site at which dependence on maize was more established. Shady Grove females averaged 154.37 cm in height, which is 1.77 cm shorter than values at the other sites. Shady Grove and Lake George also exhibited similar levels of sexual dimorphism in stature (.937 and .955 respectively) which was less than the level seen at Mangum (.919), indicating male growth was being especially affected. Transverse bone dimensions followed a similar pattern with individuals at Shady Grove and Lake George being generally more gracile. These findings support that those undergoing the transition to horticultural subsistence exhibited poorer health as compared to later groups.

O11.20
2:15 SERVICE LEARNING IN SECONDARY MATHEMATICS EDUCATION

Lecretia Buckley
Jackson State University, United States

Development in mathematics education requires that pre-service teachers engage in opportunities that foster their continued development of conceptual understanding of mathematics concepts as well as the development of effective pedagogical strategies. Service learning activities are educational activities in which the learner engages in community service with objectives for discipline specific knowledge development through the implementation of activities and reflections on learning. In this session the presenter outlines a secondary mathematics methods course that included service learning activities to provide greater impact than traditional observations typically allow. The integration of service learning activities in the course design provided a rich site to address two goals –

development of conceptual understanding and effective pedagogical strategies. These field-based experiences required pre-service secondary mathematics teachers to design instruction for K-16 students at varying levels of achievement as they examined various curricula, classified learning tasks with respect to cognitive demand, and analyzed student performance. Two variations of the implementation of the secondary mathematics education methods course design with integrated service learning activities provide insights for mathematics teacher education in the areas of developing conceptual understanding and meeting diverse learning needs. Utilizing the aforementioned service learning activities provided pre-service teachers with opportunities to learn more mathematics, and to do so with a deeper learning of understanding as evidenced in their reflections of the service learning activities, teaching, and classroom assignments which required them to work mathematics problems.

2:30 QUESTIONS AND ANSWER SESSION

SCIENCE EDUCATION
Chair: Jacob Blickenstaff,
University of Southern Mississippi
Vice-chair: Bud Donahou,
Northwest Community College

THURSDAY MORNING
R. C. Cook University Union Rooms B and C

O12.01
8:00 INCORPORATION OF SERVICE LEARNING INTO GENERAL COLLEGE ECOLOGY

Johnny Mattox
Blue Mountain College, Blue Mountain,MS, United States

Service learning projects are now being used as an important part of biology courses offered at several colleges across the United States. Service learning is particularly suited to being incorporated into general college ecology classes. After a discussion of the goals of service learning, the ecology students of Blue Mountain College adopt a community-related service project each semester. One such project that has been beneficial to students, the surrounding community, and the college environs, has been reduction of pollution in a creek that runs through the town of Blue Mountain in close proximity to the college campus. Some of the activities students have been involved with include cleaning the creek of debris and trash, chemically testing the water quality, and monitoring the living organisms found in the creek. Students have indicated that involvement in this type of project has been a rewarding experience as well as a learning experience with implications far beyond the classroom setting

O12.02
8:15 BASE PAIR: EARLY BIOMEDICAL OUTREACH IMPACTS SCIENCE EDUCATION

Rob Rockhold[1], Susan Bender[2], Cindy Cook[3], Karen Evans[4], Jeff Stokes[1], Kathy McKone[5], Linda Nobles[2], Denise Thibodeaux[6], Cassondra Vanderford[3], Donna Sullivan[1]
[1]Univ. Mississippi Medical Center, Jackson, MS, United States, [2]Jackson Public Schools, Jackson, MS, United States, [3]Rankin County Schools, Puckett, MS, United States, [4]Madison County Schools, Madison, MS, United States, [5]Lincoln County Schools, Enterprise, MS, United States, [6]Cathedral Catholic High School, Natchez, MS, United States

Base Pair encompasses four initiatives that promote higher education advancement, biomedical career choice, and teacher professionalism; the namesake mentoring activity pairing public high school students with medical center faculty; Student Oriented Academic Research (SOAR) extending science education into urban Jackson high schools; the Rural Biomedical Initiative (RBI); and teacher training in a Summer Research Institute (SRI). A total of 163 students have participated or are participating in Base Pair (1992-2011) and 51 graduates have engaged in post-baccalaureate training (20 MD, 6 PhD, 1 MD/PhD, 19 MS, 5 JD). Overall, 47% of graduates who have completed college are engaged in a science career or career path. Base Pair students have authored over 221 scientific citations. SOAR and RBI sites enroll or have trained 1,381 urban and rural high school students. Three SOAR and five RBI sites will be active in 2010-11. The 2010 SRI provided two sessions for teacher development in grant-writing and advanced bioscience activities, in concert with training by the Enterprise, MS Princeton Learning Center. A total of 97 teachers have trained (1994-2010) in the SRI and 108 teacher-initiated grants have resulted from SRI-developed applications, with

a 74% rate of funding and roughly $392,614 new funds generated for teacher use. Base Pair initiatives have exerted a positive impact on Mississippi urban and rural science education and advancement of a diverse population of students into science career paths. (Supported by Howard Hughes Medical Institute)

O12.03
8:30 A LOOK AT COLLEGE STUDENTS' REMEMBERING AND UNDERSTANDING OF DNA, GENES, TRAITS, AND PROTEINS AND HOW THESE CONCEPTS RELATE TO ONE ANOTHER

Lynn Singletary, Angela Bruni, Kristy Halverson
University of Southern Mississippi, Hattiesburg, MS, United States

Genetics knowledge is essential because of its increasing impact on societal issues. We investigated students' knowledge of DNA, genes, proteins, and traits and how they relate to one another. We conducted semi-structured interviews to identify and describe four college students' ideas about the structural and functional relationships between genetic components. We evaluated student responses in relation to the modified version of Bloom's taxonomy. Our findings showed that student knowledge did not advance past the Understanding level of Bloom's Taxonomy. A more holistic and integrative approach to teaching and learning molecular genetics could provide students with a more cohesive view of genetics. This, in turn, could promote more informed participation in genetics related decisions relevant to social issues.

O12.04
8:45 ASSESSMENT COMPARISONS BETWEEN LECTURE-BASED OR INQUIRY EMPHASIZED TEACHING: WHAT IS FAIR?

Elizabeth Mitchell, William Sumrall
University of Mississippi, Oxford, MS, United States

The purpose of this study is to examine the relationship between assessment and teaching methods. Specifically, developing instruments that accurately assess the lecture and inquiry methods of instruction is a study focus. The study furthermore examines which teaching method yields the highest retention after an extended time period. Ninety-six undergraduate elementary education students participated in this study. They were randomly divided into two groups. Each group received a lesson focused around electricity. Group A received a lecture about how a light bulb could be lit with the use of a wire and battery. Group B received an inquiry emphasized teaching method such that each student received a battery, bulb, and wire for exploration. Group B was told and given the challenge of determining four possible ways to light the bulb. Each group was given the same assessment. One side of the instrument was designed for the lecture method while the other side was designed for an inquiry-based assessment. The instrument was administered at the beginning and then again at the end of the semester. Results from the assessments found that groups did significantly better on the assessment that was designed for their method of instruction. The second time the test was administered, Group B on average did better than Group A on their assessment types. Two conclusions drawn from this study indicate that an assessment can be significantly biased toward a particular teaching method and perhaps more importantly the inquiry emphasized hands-on method maintains greater knowledge retention over time.

O12.05
9:00 PRE-SERVICE TEACHERS' PERCEPTION OF THE PARTICULATE NATURE OF MATTER.

James Roberson, kelle Sumrall, Joe Sumrall
University of MS, University, MS, United States

The comprehension of the particulate nature of mater is important in the understanding of many scientific principles. The purpose of this study was to investigate pre-service teachers' understanding of the particulate nature of matter and to identify how misconceptions in this area can become manifest. The participants of this study were undergraduate elementary education students who were assessed with the *Classroom Test of Scientific Reasoning, The Nature of Matter Inventory Rubric,* and a five-category analysis. The results of this study indicated a lack in understanding of the particulate nature of mater within the participant group. Scores improved by 70% or more over initial evaluation after instruction which included demonstrations. This study indicated a lack of preliminary understanding within the tested group, but also demonstrates a means of correction which vastly improves this understanding.

O12.06
9:15 FLORA OF THE NATURAL HABITATS OF THE MISSISSIPPI GULF COAST COMMUNITY COLLEGE: A FIELD GUIDE

Heather Baehler[1], Shelia Brown[2]
[1]Cooperative Intern Program between the Mississippi Gulf Coast Community College – Jackson County Campus Honors Biology Students, Gautier, MS, United States, [2]the University of Southern Mississippi-Gulf Coast Research Laboratory-Marine Education Center, Ocean Springs, MS, United States, [3]the National Aeronautics and Space Administration, Stennis Space Center, MS, United States, [4]the Institute for Marine Mammal Studies, Gulfport, MS, United States

The purpose of this project was to continue the process of creating a *Field Guide* that contains the natural flora and habitats of Mississippi Gulf Coast Community College - Jackson County Campus (MGCCC-JCC). Three students will work together with the staff of the campus Estuarine Education Center to achieve the overall goals of this project. These goals included: photographing representative species of flora on the MGCCC-JCC, acquiring information about each species, and developing text for a *Field Guide* to the natural flora of the campus. The presentation to follow will be based on a select group of plant life from the *Field Guide*

O12.07
9:30 CAN ONLINE DISCUSSION BOARDS FACILITATE STUDENTS' CLIMATE CHANGE LITERACY AND THE UNDERSTANDING OF THE NATURE OF SCIENCE?

Renee Clary[1], James Wandersee[1]
[1]Mississippi State University, Mississippi State, MS, United States, [2]Louisiana State University, Baton Rouge, LA, United States

In an online master's geology course, students researched and investigated the current climate change debate. Four sections of Earth History (n = 10, 20, 25. 29) accessed journal articles, videos, and internet resources during 12 course units. Following a self-assessment pre-survey on incoming knowledge, we randomly assigned students to discussion groups (n = 8). For each unit, we also posted 2-5 reflective, critical thinking questions to guide discussions. Students 1) analyzed data sources, 2) judged the research relevance and its application beyond the original study, 3) identified nonscientific views, 4) analyzed the current warming trend against the broader scale of geologic time, and 5) conducted outside research to identify additional resources. We are currently in the process of coding (7,500+) discussion responses. For the final discussion, each group compromised and summarized a group consensus on the climate change issue. At the end of the semester, students again accessed and completed a self-assessment survey.

The paired pre- and post-test self assessment surveys (n =80) reveal that the vast majority of students (91%) felt the online peer discussion forums promoted greater scientific understanding of the climate change issue. Additionally, students reported that climate change discussions resulted in greater awareness of potential bias in some media sources, as well as their improved ability to judge the scientific value of news reports. Students expressed the need to incorporate climate change (or similar current scientific issues) in science classrooms in order to facilitate scientific awareness among students.

O12.08
9:45 D"ENCOURAGING A CLEVER PUPIL"--HOW LINNAEUS INTEGRATED TEACHING AND RESEARCH

James Wandersee[1], Renee Clary[2]

[1]Louisiana State University, Baton Rouge, LA, United States, [2]Mississippi State University, Starkville, LA, United States

At present, many scientists consider the history of science to be of limited value for informing their current teaching and research practices. Scientific journal articles that reference work conducted more than 20 years old are frequently deemed suspect or outdated. However, we contend that exemplars of excellence in teaching and research drawn from a great botanist of the past have the potential to inspire and inform faculty and students today. When injected judiciously, they can help us teach "how we came to know what we know" in science. For example, Carolus Linnaeus (1707-1778) was a scientist who revolutionized botany and founded modern taxonomy. Our research in Sweden at Linnaeus' own university, garden, home, and farm was conducted during two summers. We studied his life's work via site visits, historical documents, and artifacts, using accepted historiographic methods (Howell & Prevenier, 2001). As a result, we have

synthesized a new and imitable model of 16 teaching moves that Linnaeus used with his students to achieve a confluent integration of plant science teaching and research.

10:00 BREAK

O12.09
10:15 CAPITALIZING ON INFORMAL SCIENCE EDUCATION OPPORTUNITIES: NATIONAL FOSSIL DAY AND THE GEOLOGY OF MISSISSIPPI

Renee Clary, Jessica Kelly, Burnette Hamil, Amy Moe Hoffman
Mississippi State University, Mississippi State, MS, United States

On October 13, 2010, the United States celebrated the first National Fossil Day as the newest component of Earth Science Week. The Dunn-Seiler Museum at Mississippi State University participated in this newest geoscience opportunity through a new exhibit and public engagement. Although the Dunn-Seiler archives, curates, and displays fossils from our collections, the displays are "traditional" and not conducive to informal learning among the majority of museum visitors, primarily school children and undergraduates enrolled in geology laboratory courses. Therefore, we chose to redesign three display cabinets within the museum in order to highlight the geologic history of our state through fossils. Several interesting specimens were identified within museum collections, and became the focal points of the new exhibit. The new exhibit also officially displays our hadrosaur bones, which were on loan for research and only recently returned.

The Earth Science Literacy Principles were used in the exhibit's design. By focusing on the exposed geologic strata of the state, the displays were color-coded as to age, and signage was designed to be engaging as well as informative. "Mississippi's Geologic Timeline" officially opened on National Fossil Day, and was celebrated during "Fossil Extravaganza," an informal reception in which visitors could view the exhibit and participate in fun, educational activities. The museum also sponsored an art and writing contest among Mississippi school children (Grades 1-8) to officially welcome the dinosaur back to campus. The community response has been exceptional, resulting in departmental support for an annual fossil event.

O12.10
10:30 INCREASE STUDENT LITERACY SKILLS USING CASE STUDIES

Susan Bender
Jim Hill High School, Jackson, MS, United States

Students reading on the fourth grade level when entering advanced science classes are able to be successful reading and analyzing orimary source documents after instruction ising teacher developed case stuides in mictobiology, toxicology, genetics, and forensics. Students are also able to develop effective reading writing, and speking skills in science. Project funded in part by a grant from the Howard Hughes Medical Institute awarded to the Base Pair program at the University of Mississippi Medical Center, Dr. Rob Rockhold Program Director.

O12.11
10:45 USING COLLEGE READINESS STANDARDS AND PERFORMANCE LEVEL DESCRIPTORS TO ENHANCE HIGH SCHOOL SCIENCE INSTRUCTION

Cindy Cook[1], Libby Cook[2], Mautoyia Cooper[2]
[1]University of Mississippi Medical Center, Jackson, MS, United States, [2]Rankin County Schools, Brandon, MS, United States

College Board Standards for College Success outline a clear and coherent pathway to college readiness with the goal of increasing the number and diversity of students who are prepared not only to enroll in college, but to succeed in college and 21st-century careers. The College Board Readiness Standards are detailed, research-based descriptions of the skills and knowledge associated with what students are likely to know and be able to do based on their EXPLORE, PLAN, and/or ACT test scores. Readiness standards are measured in the context of science topics students encounter in science courses. These topics may include: Life Science/Biology, Physical Science/Chemistry, Physics and Earth & Space Science. Rankin County science teachers grades 5-12 are identifying Performance Level Descriptors embedded in the 2010 Mississippi Science Framework and matching them to the College Readiness Standards outlined by ACT as a means to increase teacher awareness and subsequently student performance. Performance levels from previous EXPLORE, PLAN and/or ACT test scores will be used for comparison. The Performance Level Descriptors articulate clear

standards and objectives with supporting, in-depth performance expectations to guide instruction and assist teachers in designing lessons and classroom assessments. This presentation will provide examples of the College Readiness Standards and Performance Level Descriptors as they are matched with the science framework. Also, a representative lesson encompassing the requirements for higher order skills and knowledge will be included. (Supported by Howard Hughes Medical Institute)

O12.13
11:00 USING POPULAR MOVIES IN SCIENCE EDUCATION

Jacob Clark Blickenstaff
University of Southern Mississippi, Hattiesburg, MS, United States

Popular films and television shows provide many opportunities for science teachers to inspire students. Some illustrate scientific principles accurately, while the errors in others can be excellent teachable moments. The author of NSTA's "Blick on Flicks" will answer the following questions: How can K-16 teachers effectively integrate these clips into class? What films outside the action and science fiction genres can be used in the science classroom? What television shows provide good, bad, or ugly examples of science?

11:30 Division Business Meeting

THURSDAY AFTERNOON
R. C. Cook University Union Rooms B and C

O12.14
1:00 THE ART MUSEUM: A PLACE OF EDUCATION THROUGH VIEWING AND DOING

Chris Alford[1], Melissa Johnson[2]
[1]Cooperative Intern Program between the Mississippi Gulf Coast Community College – Jackson County Campus Honors Biology Students, Gautier, MS, United States, [2]the Walter Anderson Museum of Art, Ocean Springs, MS, United States, [3]the National Aeronautic and Space Administration, Stennis Space Center, MS, United States, [4]the Institute for Marine Mammal Studies, Gulfport, MS, United States

It has been said that "a picture is worth a thousand words." This project combined art and words to enhance student-learning in an art museum. The Water Anderson Museum of Art, (WAMA), is dedicated to Anderson and his work. It also has many exhibits that relate to his artistic endeavors. During the year, surrounding school districts bring students to the Museum. This project required the development of *Interactive Exhibit Guides* for the students using a "hands on" approach. Some of the following exhibits were represented: the Art of Nature, the Little Room, and the Community Center.

O12.15
1:15 IT IS NEVER TOO SOON TO LEARN ABOUT THE BODY

Alexandra Young[1], Lori Amato[2]
[1]Cooperative Intern Program between the Mississippi Gulf Coast Community College – Jackson County Campus Honors Biology Students, Gautier, MS, United States, [2]Pecan Park Elementary School, Ocean Springs School District, Ocean Springs, MS, United States, [3]the National Aeronautics and Space Administration, Stennis Space Center, MS, United States, [4]the Institute for Marine Mammal Studies, Gulfport, MS, United States

The purpose of this project was to teach third graders at Pecan Park Elementary School how their bodies work. Selected systems of the body were presented to the students. These systems included the nervous system, digestive system, muscular system, skeletal system, respiratory system, and the immune system. For each system, the students were given a pre- and posttest, and a list of vocabulary words. The students were also presented a PowerPoint and a short video on each system. Additionally, activities and worksheets were developed to achieve enhanced content knowledge by the students. By the conclusion in teaching each system, the posttest results were significantly higher than the pretest results; therefore, the students learned significantly more about each body system than they knew prior to this series of lessons.

O12.16
1:30 KEEPING YOUR HANDS CLEAN

Amanda Bowman[1], Roma Flowers[2]
[1]Cooperative Intern Program between the Mississippi Gulf Coast Community College-Jackson County Campus Honors Biology Students, Gautier, MS, United States, [2]Mississippi Department of Marine

Resources, Biloxi, MS, United States, [3]the National Aeronautic and Space Administration, Stennis Space Center, MS, United States, [4]the Institute for Marine Mammal Studies, Gulfport, MS, United States

The purpose of this project was to increase hygiene awareness in third grade students. Emphasis was placed on keeping hands germ-free. The students were given the opportunity to read several books describing germs, their life cycles, and general habitats. The children completed work sheets corresponding to the various germs common to the local area. Next, various hand-washing techniques were researched and practiced. After a few sessions of developing hand-washing skills, the students were given some glow-in-the-dark "fake" germs. This product was a lotion with which the students covered their hands. The students discovered that careless hand-washing was ineffective. Pre- and post-tests were administered relative to germ awareness and hand-washing.

O12.17
1:45 REJECTING MYTHS AND MISCONCEPTIONS IN ASTRONOMY FOR THE MIDDLE GRADES

Carl Dewitt, William Sumrall
University of Mississippi, University, MS, United States

Many middle school students have deep misconceptions about the field of astronomy. Additionally, many students believe in multiple myths that are held concerning our solar system and universe. The purpose of this presentation is to review a curriculum developed through a grant funded by the Space Telescope Science Institute[1] that is specifically focused on addressing myths and misconceptions that middle school students have about astronomy. Field-tested teaching units titled-Missions to the Moon;

Interactions Between the Earth and Sun; Interactions Between the Earth, Sun and Moon; and The Solar System and Beyond, consistently focus on the many myths and misconceptions found within the field of astronomy. Each unit is comprised of seven or more lesson plans. This presentation will review some of these lessons and discuss how the implementation of this curriculum can help correct the myths and misconceptions that students have. A matrix identifying how the lessons are linked to the National Science Education Content Standards is provided at the end of the curriculum.[1]

"Support for program HST-ED-90302.01-A was provided by NASA through a grant from the Space Telescope Science Institute, which is operated by the Association of Universities for Research in Astronomy, incorporated, under NASA contract NAS5-26555."

O12.18
2:00 TEACHING FIFTH GRADERS THE LAWS OF MOTION, ENGERY, AND LIGHT

Malcolm Napoleon Aikens[1], Pattie Butirich[2]
[1]Cooperative Intern Program between the Mississippi Gulf Coast Community College – Jackson County Campus Honors Biology Students, Gautier, MS, United States, [2]Taconi Elementary School, Ocean Springs School System, Ocean Springs, MS, United States, [3]the National Aeronautics and Space Administration, Stennis Space Center, MS, United States, [4]the Institute for Marine Mammal Studies, Gulfport, MS, United States

The purpose of this project was to teach fifth graders the laws of motion, energy, and light. The students learned formulas associated with the chapter and performed activities that were related to the lesson. The lesson was taught in two different classes with evaluations approved by the teacher. In the evaluation process, the content of the effectiveness of the presentation by the Intern, as well as the administration of pre- and posttests were analyzed and interpreted. The students were engaged in all aspects of the lessons and also asked questions on a higher learning level. The content in this unit was designed to enhance student knowledge and success in partially fulfilling the goals and objectives of the science portion of one of the state exams.

O12.19
2:15 DEVELOPMENT OF ROBOTICS SKILLS IN SECOND AND THIRD GRADE STUDENTS TO IMPROVE PROFECIENCES IN SCIENCE, TECHNOLOGY, ENGINEERING, AND MATHEMATICS

Kimberly E. Gage[1], Anja Comeford[2]
[1]Cooperative Intern Program between the Mississippi Gulf Coast Community College-Jackson County Campus Honors Biology Students, Gautier, MS, United States, [2]Magnolia Park Elementary, Ocean Springs School District, Ocean Springs, MS, United States, [3]the National Aeronautics and Space Administration, Stennis Space Center, MS, United States, [4]the Institute for Marine Mammal Studies, Gulfport, MS, United States

Young students need exposure to a multi-faceted education that promotes an integration of several areas of learning. This project taught intellectually gifted 2nd and 3rd grade students how to design and program a working robot, use software media to acquire information, and use feedback to adjust a programming system output. The LEGO WeDo robots were used with 2nd graders while LEGO NXT Mindstorms robots and engineering software from Carnegie Mellon were used with 3rd graders. Robotics provided a unique cross-curricular learning experience necessary to develop skills in science, technology, engineering, and mathematics, as well as effective communication and literacy. Each lesson plan was focused on seamlessly blending each of these fields into one project to promote an enriched learning experience. The students' progress was monitored through on-going assessments to evaluate the effectiveness of the robotics program.

2:30 BREAK

O12.20
2:45 FORMAL AND INFORMAL ENVIRONMENTAL EDUCATION IN THE NORTHERN GULF OF MEXICO: AN EXPERIENTIAL LEARNING PROJECT FOR UNDERREPRESENTED AND UNDERSERVED POPULATIONS

Shelia Brown, Sherry Herrron
The University of Southern Mississippi, Ocean Springs, MS, United States

Information on implementation strategies and evaluation results of the first and second phases of the Formal and Informal Environmental Education of the Northern Gulf of Mexico (FIEE) project will be presented. This environmental experiential learning project is funded by the Gulf of Mexico Program-Environmental Protection Agency. The project is designed to enhance environmental awareness and improve stewardship ethics of participants. Focus topics of instruction are those addressed in GOMA's Governors' Action Plan for Healthy and Resilient Coasts. Formal and informal institutions of Alabama, Louisiana, and Mississippi target audiences to include teachers, K-12 underrepresented and underserved students, and the general public. Implementation strategies include teacher workshops, field and classroom activities for students and teachers.

O12.21
3:00 DEVELOPING COMPLIMENTARY EDUCATIONAL BROCHURES FOR THE PUBLIC VISITING THE INSTITUTE FOR MARINE MAMMAL STUDIES

Courtney Parker[1], Sharon H. Walker[2]
[1]Cooperative Intern Program between the Mississippi Gulf Coast Community College-Jackson County Campus Honors Biology Students, Gautier, MS, United States, [2]the Institute for Marine Mammal Studies, Gulfport, MS, United States, [3]the National Aeronautics and Space Administration, Stennis Space Center, MS, United States

The purpose of this project was to develop two, different series of educational brochures, focusing on sea turtles and select fisheries in the Mississippi Sound and the Gulf of Mexico. Specifically, these two series of complimentary educational brochures will enhance the understanding-by the public visiting the IMMS-CMER-of the five threatened and/or endangered species of sea turtles, i.e., the Kemp's Ridley, the Hawksbill, the Loggerhead, the Green, and the Leatherback and select, sports fish sought by fishing enthusiasts, i.e., red snapper, red drum, cobia/lemon fish, speckled trout, and mackerel. The sea turtle brochures will provide information relative to their classification, distribution, anatomy, reproductive cycle, and rationale on "why" they are threatened and/or endangered. For the select sports fish, the brochures will also provide similar parameters for size and number limits when fishing for these beautiful and delicious creatures, their distribution, and a general overview of their anatomy and reproductive cycles. Attendees will also be provided an overview of the process involved in the development of brochures used for the public.

O12.22
3:15 BREAKING INTO SHELLS!

Miranda Hodges[1], Chris Breazeale[2]
[1]Cooperative Intern Program between the Mississippi Gulf Coast Community College – Jackson County Campus Honors Biology Students, Gautier, MS, United States, [2]the Institute for Marine Mammal Studies, Gulfport, MS, United States, [3]the National Aeronautics and Space Administration, Stennis Space Center, MS, United States

The purpose of the seashell project eas to ensure each seashell in a donated collection is properly labeled. The donor placed each shell in an individual container or bag and included each shell's history on a slip of paper, which was in the same container as the shell. The history consists of the seashell's family name, common name, and where the collector found the shell. Each shell's labeling was verified by using Internet® websites. If the collector labeled a shell incorrectly or the shell name changed since the collector found it, the labeling was amended. At the conclusion of this research, the 220 shells were verified for proper identification and placed in newly constructed display cases for public viewing at the Center for Marine Education and Research at the Institute for Marine Mammal Studies in Gulfport, MS.

O12.23
3:30 RECOVERING AND RESTORING LIBRARY MATERIALS AT THE NATIONAL OCEANIC AND ATMOSPHERIC ADMINISTRATION

Haley Denmark[1], Lagena Fantroy[2]
[1]Cooperative Intern Program between the Mississippi Gulf Coast Community College – Jackson County Campus Honors Biology Students, Gautier, MS, United States, [2]the National Oceanic and Atmospheric Administration, Pascagoula, MS, United States, [3]the National Aeronautics and Space Administration, Stennis Space Center, MS, United States, [4]the Institute for Marine Mammal Studies, Gulfport, MS, United States

The National Oceanic and Atmospheric Administration (NOAA) is a scientific agency within the United Stated Department of Commerce that does everything from determining daily weather forecasts to managing fisheries and supporting marine commerce. *Hurricane Katrina's* storm surge completely destroyed the library and all patron materials used by the researchers at NOAA Fisheries in Pascagoula, MS. The purpose of the project revolves around recovering library materials that were displaced due to the establishment of a new library. This project entails all participants to develop a new library layout and redesign the library services being provided for patron support. Procedures include unpacking donated library materials, as well as restored materials that were chemically treated to further use. All items will be unpacked, sorted, and shelved in order to restart library services that reference the subjects of Ecology, Marine Biology, Mammals, Marine Harvesting, and Plankton Protection

Division Poster Session
Following Dodgen Lecture

P12.01
EXAMINING THE IMPACT OF TASK ORDER ON A TREE THINKING PRETEST

Carrie Jo Boyce, Kristy L. Halverson
The University of Southern Mississippi, Hattiesburg, MS, United States

All people, students especially, are influenced by everything they see, hear, read and do. Thus, the order in which tasks are presented in an educational setting can impact how students interpret and complete following tasks. This study investigates the types of representations students generate when trying to visually depict evolutionary relatedness and how these representations vary when students are given the task at the beginning of a pretest versus at the end of a pretest. The pretest we used was designed to assess student knowledge of evolution content and how they interpreted phylogenetic representations. Data came from 135 upper-level, life science students from two universities, across four semesters. Students were more likely to draw representations similar in appearance to a phylogenetic tree when given the tree building task at the end of the pretest. Likewise, students were more likely to draw alternative, non-treelike representations when given the task at the beginning of the pretest. This shows that task order does influence student responses by impacting types of representations students generate thus it influences accurate assessment of students' prior knowledge.

P12.02
PRESCHOOL SCIENCE

William Gill[1], Junita Coloma[2]
[1]Cooperative Intern Program between the Mississippi Gulf Coast Community College – Jackson County Campus Honors Biology Students, Gautier, MS, United States, [2]St. John's Episcopal Pre-School, Ocean Springs, MS, United States, [3]the National Aeronautic and Space Administration, Stennis Space Center, MS, United States, [4]the Institute for Marine Mammal Studies, Gulfport, MS, United States

Prior to redesigning the curriculum, the faculty and staff of the St John's Episcopal Pre-School (SJEPS) considered the following: are preschool students too young to learn basic science

principles? The students in the preschool were within the four- and five-year range. The purpose of this project was to develop several units containing many different types of " hands on" activities to enhance and entice young minds. Some of the topics considered were: "Spiders: Fun with Creepy Crawlers," In Goes a Bean, Out Comes a Sprout," and "Sink or Float, What Will It Be?" Student success was determined by pre- and post-tests. The enthusiasm and recorded data support readiness of preschool children for meaningful scientific endeavours

P12.03
DR. THOMAS F. LYTLE AND DR. JULIA S. LYTLE AND A HISTORY OF RESEARCH IN MARINE CHEMISTRY AT THE GULF COAST RESEARCH LABORATORY

Joseph Barlow[1], Joyce M. Shaw[2]
[1]Cooperative Internship Program between the Mississippi Gulf Coast Community College—Jackson County Campus Honors Biology Students, Gautier, MS, United States, [2]the University of Southern Mississippi—Gulf Coast Research Laboratory, Gunter Library, Ocean Springs, MS, United States, [3]the National Aeronautics and Space Administration, Stennis Space Center, MS, United States, [4]the Institute for Marine Mammal Studies, Gulfport, MS, United States

The Gunter Library at the Gulf Coast Research Laboratory (GCRL) collects and maintains archival materials related to the Lab's history, its faculty, staff, students, and programs. Significant among the materials are newspaper clippings, reports, photographs, and publications generated by researchers at GCRL. As part of a 15-year effort to document and preserve the GCRL history, the project focused on the works of Dr. Thomas F. Lytle and Dr. Julia S. Lytle, University of Southern Mississippi Department (USM) of Coastal Sciences professors emeritus and GCRL marine chemists for nearly 30 years. Articles, reprints, geological guidebooks, newspaper clippings, and other historical materials were sorted and organized for preservation and conservation purposes. A list of their scientific publications was added to an existing bibliographic database. A poster was created for the 2011 Mississippi Academy of Sciences (MAS) annual conference which highlighted their contributions to research, teaching, and service including their involvement with MAS and the Cooperative Internship Program at the MGCCC-JCC.

P12.04
IDENTIFYING COLLEGE STUDENTS' ALTERNATIVE IDEAS ABOUT CELLULAR RESPIRATION

Jill D. Maroo, Sara L. Johnson, Kristy L. Halverson
The University of Southern Mississippi, Hattiesburg, MS, United States

Alternative conceptions are prevalent in college classrooms and can impact student learning. However, little is known about student ideas regarding the Tricarboxylic Acid (TCA) cycle (Songer & Mintzes, 1994). In this study, we create a taxonomy of student held alternative conceptions regarding the TCA cycle. We conducted semi-structured interviews with ten undergraduates enrolled in an introductory biology course 3-4 weeks after instruction on the TCA cycle. We found that students struggled when asked to explain the TCA cycle. Specifically, we identified four new student held alternative conceptions: location of the TCA cycle, placement of the TCA cycle in cellular respiration, function of the mitochondria, and requirements of the TCA cycle. Our research provides implications for instruction by informing instructors about what students are thinking. This knowledge allows instructors to focus on target areas to overcome alternative ideas about the TCA cycle to improve student learning.

P12.05
REVISION OF *CHEMISTRY LAB II MANUAL*

Fatama Mohy El-Din[1], Steve Manis[1]
[1]Cooperative Intern Program between the Mississippi Gulf Coast Community College-Jackson County Campus Honors Biology Students, Gautier, MS, United States, [2]the National Aeronautics and Space Administration, Stennis Space Center, MS, United States, [3]the Institute for Marine Mammal Studies, Gulfport, MS, United States

The purpose of this project was to revise the *Chemistry Lab II Manual*. The process included a careful study of the units included. Area topics developed were: "Titrations with Permanganate," "Inorganic Synthesis of Hexaaminenickel III," "Distillation," "Chemical Equilibrium," "Buffer Solutions," and "Solubility Products." Background information was gathered from many reference books and a thorough search of various websites.

Experiments were designed and appropriate background information added. Students are encouraged to include and design data tables to support their findings.

P.12.06
A QUANTITATIVE STUDY OF THE EFFECTIVENESS OF INFORMAL BIOLOGY EDUCATION

Kayla DiIorio, Aimee Thomas
The University of Southern Mississippi, Hattiesburg, MS, United States

Informal biology education (IBE) is an essential aspect of educating young students about science, especially those students who may not already be excited about the hard sciences. The National Science Foundation refers to informal science education as programs that promote science, technology, engineering, and mathematics (STEM) education in innovative ways. This study was conducted to establish the effectiveness of an IBE program at The University of Southern Mississippi. Since biology education can be done informally in a number of different settings, there is typically something for everyone. That is, different informal activities have the potential to appeal to students who learn in different ways by being interactive and diverse. Because of the ability to mold itself, IBE is often a much more positive experience of learning than a biology lesson from a textbook. This summer program was available for rising ninth grade students from state-wide GEAR UP schools with the intention of establishing biological literacy in areas from microbiology to ecology while preparing them for the state biology subject area test. A pre/posttest was developed to test content and was administered to the program attendees at the beginning and end of the program. The scores of the test were gathered and compared to each other. The differences in the pre/posttest scores indicate there was an improvement in biological content thus supporting that IBE is an effective approach to teaching the subject matter.

ZOOLOGY
Chair: Alex Alcholonu**,** Alcorn State University
Vice-chair: Julius Ikenga, Mississippi Valley State University

THURSDAY MORNING
R. C. Cook University Union Room H

O13.01
9:00 A RETROSPECTIVE STUDY ON HUMAN PARASITIC AND MYCOTIC INFECTIONS IN MISSISSIPPI

Alex Acholonu
Alcorn State University, United States

The Mississippi State Public Health Laboratory records covering the period from 1989 to1997 were obtained and examined for human parasitic and mycotic infections. This study was carried out to know the pattern and distribution of these infections state-wide during the period surveyed. It was also to document it for posterity. The specimens for diagnosis were submitted to the Mississippi State Public Health Laboratory by clinics and health centers from different counties in the State of Mississippi. They were diagnosed, collated and tabulated. Of 26,219 specimens submitted, 7.6% were positive with parasitic infections and 37.1% with fungal infections. These included 5 Genera of protozoans, 6 of helminthes and 4 of mycotic flora. The overall occurrence of protozoans was 7.6%, helminthes, 2.0% and mycotic infection, 37.1%. For several years, the recording and reporting of state-wide prevalence of parasitic infections has dwindled and is now minimal or practically non-existent. It is recommended that this be resumed especially as people from different parts of the world including those from developing countries where parasitic infections are galore, are now establishing residence in the State.

O13.02
9:20 OCHOCERCIASIS AND THE SOCIOECONOMIC CHALENGE FOR THE THIRD-WORLD COUNTRIES.

Ryan Burciaga, Julius Ikenga, Courtney Carson, Theresa Cayot, Ursula Johns, Ashley Linzy, Roselyn McDaniel, Taniya Wallace
Mississippi Valley State University, United States

Ochocerciasis is a human disease caused by both adult and juvenile stages of *Onchocerca volvulus.* The latter is a parasitic filaroid-worm that is transmitted by a blood-sucking black fly, *Simulium sp*. Geographic regions of the disease include Africa, Arabia, Columbia, Guatemala, Mexico, and Venezuela. The adult worms are responsible for onchocercomas whose location on the body parallels the vector behavior. Some onchocercomas are benign while others can present body disfigurement called hanging groin. The presence of juvenile worms in human body elicits inflammatory reactions that cause dermatitis, lichenification, and sclerosing keratitis. The latter usually causes blindness. Onchocerciasis appears to parallel the socioeconomic strata in the endemic regions. People on the lower levels of socioeconomic strata; the subsistence crop farmers, livestock workers, as well as those that frequent high humid and streamside vegetations are mostly infected. Onchocerciasis is a non lethal disease and hence does not meet the criteria for emergency in many developing countries. However, the body disfigurement and the debilitating effects of the disease continue to unleash high economic burden and social deprivation on developing countries.

O13.03
9:40 THE CARRIER RATE OF NEW CASTLE DISEASE VIRUS IN DUCKS IN OWERRI AREA OF IMO STATE, NIGERIA

Ambrose Opara[1], Alex Acholonu[1]
[1]Imo State University, Nigeria, [2]Alcorn State University, United States

The carrier rate of Newcastle disease virus(NDV) in ducks was investigated in Owerri Local Government areas, viz, Owerri Municipal Council, Owerri North and Owerri West in Imo State, Nigeria between January and April 2006. This was to find out if the virus occurs ducks in the study area. A total of 60 apparently, healthy ducks were tested. Duck cloacal swabs were obtained and inoculated into embryonated hens'eggs via the allantoic route and incubated for 96 hours at 37 degrees centigrade in a humidified incubator. Only one of the 60 ducks (D!4) tested positive for NDV and it was collected from the Owerri Municipal Council area. The isolate that yielded positive result was from a white duck. From the study, the carrier rate of NDV in ducks in Owerri area of Imo State, was 1.6%. The occurrence of NDV in ducks is a geographical record for Imo State. Further studies of this nature is recommended for future investigators in order of determine the distribution pattern of the New Castle disease virus in Imo State.

O13.04
10:00 THE DELIMA OF LEISHMANIASIS

Brittney Boykins, Julius Ikenga, Sherry Taylor, Krystina McCleary, Nicole Johnson, Bradley Murray, Haleigh Eubanks, Britt Goodman, Latressis Ware, Nina Walker-Fran
Mississippi Valley State University, United States

Leishmaniasis is a blood and tissue disease of some mammals that is caused by *Leishmania sp.* The latter is a protozoan parasite that is transmitted by an infected blood-sucking female sandfly in the family Psychodidae. Ancient recordings suggest that the disease has been around since the 7th century. The geographic distribution of the disease includes the tropical and subtropical regions of Africa, Southeast Asia and the Middle East, and Central and South Americas; involving as many as 88 countries. 12 million people worldwide are afflicted with various degrees of skin, visceral, and vicerotropic ulcerations with about two million new cases per year. In severe cases, progressive body wasting, anemia, hepatomegaly, spleenomegaly, and death occurs in about two years. Co-infections with HIV and leishmaniasis have been reported from 35 countries, as the geographic boundaries of the two infections rapidly continue to overlap. Puzzling and an impediment to finding a cure is the ability of the *Leishmania sp*. to find a safe haven inside immune cells that are supposed to eliminate them from the human body. Evidence also suggests that the parasite is rapidly evolving and adapting to local populations of humans and the insect vector, which will further reduce the chances of the disease eradication.

O13.05
10:20 SCHISTOSOMIASIS AND THE SOCIOECONOMIC MALAISE OF THE THIRD-WORLD COUNTRIES

Gladys Mitchell, Julius Ikenga, Bradley Murray, Brittney Boykin, Jemelody Brown, Nathalia Bracey-Hill
Mississippi Valley State University, United States

The digenean trematodes, Schistosoma mansoni, S. japonicum, and S. haematobium, primarily cause human schistosomiasis. The latter is a parasitic disease that follows three distinct phases: migratory, acute, and chronic. The migratory phase is marked by dermatitis and the acute by chills, fever, aches, and abdominal discomfort. Adult worms live in the mesenteric vein systems of humans where they shed their eggs. Symptoms and pathologies exhibited by the chronic phase of the disease noticeably include granulomas, hematuria, ascites, sleenomegaly, portal hypertension and cirrhosis. Geographic regions for the disease include tropical, sub tropical, and Southeast Africa; Arabia peninsula; India, SE Asia; and South America. At risk for schistosomiasis are 600 million people in 74 countries where 200 million are afflicted. Schistosomiasis, as it appears, tends to follow certain man-made environmental changes, such as construction of dams, irrigation schemes, deforestations, urbanization, and migrations that are designed to usher in new and rigorous socioeconomic melieus or at best to improve the status quo. But these new development programs tend to extend the habitats of the secondary hosts for the parasites. Consequently, the well intended programs and ablution end up causing more misery than they help. Thus, the socioeconomic outlook in most of the affected countries, especially at the local levels, continues to remain dim. A multi-facetted approach to controlling schistosomiasis holds a better expectation.

10:30 BREAK

O13.06
10:40 GENDER DIFFERENCES IN FHH.1^{BN} CONGENIC RATS

Kaniesha Baker[1], Jan Williams[2]
[1]Mississippi Valley State University, United States, [2]University of Mississippi Medical Center

The objectives of this research project was to determine whether there are gender differences in proteinuria, autoregulation, and glomerular permeability in male and female FHH.1^{BN} congenic rats. These rats were subdivided into two strains based on their ability to autoregulate: AR+ (does autoregulate) and AR- (does not autoregulate) strains. Proteinuria was measured by placing the rats in metabolic cages overnight, glomerular permeability was measured by labeling and isolating the glomeruli, and autoregulation was measured by comparing the percent of change from the baseline vs. the renal perfusion pressure in the kidneys. Males had a higher protein excretion than females in both of the groups studied. AR- males and females increased about 20% while the AR+ males and females only increased by 5% when studying autoregulation. There were no differences in autoregulation between males and females within the same strain either. The results of glomerular permeability are as follows: the decrease in fluorescent intensity in the AR- males was significantly lower in the AR- females and AR+ males. While the AR+ males were not significantly different compared to AR+ females, the shape of the curve is different which could indicate changes in the glomerular filtration barrier. These results indicated that the hormonal differences between males and females do not modulate the gene(s) responsible for the autoregulation of renal blood flow (RBF) in FHH rats. However, these differences may play a role in the maintenance of the glomerular filtration barrier.

INVITED SYMPOSIA
R. C. Cook University Union Room H

O13.07
11:00 WATER QUALITY STUDIES ON THE LOWER MISSISSIPPI RIVER IN THE PORT GIBSON AREA, MISSISSIPPI DURING THE WINTER OF 2009

Alex Acholonu, Martina Garda
Alcorn State University, United States

The quality of water depends upon the environment around it and land use. Many factors are involved that affect its state such as transportation, agro-activities, industries and people. Water quality standards were adopted by the State of Mississippi in 1995. The policy was to protect lotic water quality within the state. The objective of this study was to determine the presence of pollutants in the Lower Mississippi River during the winter season and to find out if their concentrations met or exceed ed the Mississippi water quality standards. During February 2009, water samples were collected from the

Mississippi River at the Grand Golf military park area in Port Gibson and in three replicates. The samples were taken to the laboratory and tested according to the directions of the manufactures of LaMotte pollution test kits. The chemical parameters tested and recorded in parts per million were 11 viz, alkalinity, carbon dioxide, chlorine, chloride, fluoride, water hardness, iron, nitrate silica, sulfide, and zinc. To assess the microbial content, coliform and Escherichia coli tests were performed. The results were recorded, analyzed, and compared with the Mississippi Water Quality Standards. Based on the results, the Lower Mississippi River met the Mississippi Water Quality Standards with the exception of water hardness. The coliform and E coli levels in the Mississippi River were above minimum level.

O13.08
11:20 WATER QUALITY STUDIES ON THE LOWER MISSISSIPPI RIVER IN THE PORT GIBSON AREA,MISSISSIPPI DURING WINTER OF 2010

Alex Acholonu, Jasmine Williams
Alcorn State University, United States

Water quality is the physical, chemical, and biological characteristics of water. It is the measure of the condition of water relative to the requirements of one or more biotic species and /or to any human need or purpose. It is most frequently used by reference to a set of standards against which compliance can be assessed. The most common standards used to assess water quality relate to drinking water, safety of human contact, and for the health of eco- systems. The purpose of this study was to assess the presence of pollutants jn the Lower Mississippi River during the winter of 2010 and find out if their concentrations meet or exceed the norms set by the State of Mississippi. As in earlier studies, water samples were collected from the Lower Mississippi River in the Port Gibson area. These were collected in three replicates, taken to the laboratory and tested according to the directions given by the manufacturers of the pollution test kits. An analysis of the results showed that the Mississippi River's highest contaminant concentration was carbon dioxide (20.0ppm) followed by chromate(5.0ppm), zinc(3.0ppm) ,(0.0)ammonia-nitrogen(1.0) and finally, cyanide(0.0). Of the parameters tested, only the concentration of carbon dioxide exceeded the norm. So, the Mississippi River met the water quality criteria of Mississippi State based on the criteria checked with the exception of carbon dioxide.

O13.09
11:40 WATER QUALITY STUDIES ON THE LOWER MISSISSIPPI RIVERIN THE PORT GIBSON AREA, MISSISSIPPI DURING THE FALL, 2010

Alex Acholonu, Martha Dee, Harriesha Howard, Avis Shelton, Jandrea Drake
Alcorn State University, United States

The Mississippi River is said to be the second longest river after the Missouri in the United States. It's drainage area includes all or part of 31 states, and is considered to be the third largest river in the world with it source in Minnesota and its mouth in the Gulf of Mexico. It is of great economic importance to the United States. This justifies its name, Mississippi River, believed to mean "father of all waters" in the Algonquian language. Because of its importance, it is necessary to monitor its quality periodically. It is thus the purpose of this study to assess its chemical profile. During the fall of 2010 water samples were collected from three different locations about fifty meters apart and in three replicates from the Mississippi River in the Port Gibson area of Mississippi. The samples were tested according to the methods indicated by the manufacturers of the LaMotte Water Pollution Detection Kits. There were ten parameters tested, and the average readings recorded. Based on the results, the Mississippi River met the water quality criteria of the State of Mississippi with the exception of carbon dioxide, and water hardness.

1:15 Division Business Meeting

THURSDAY AFTERNOON
Poster session (1:45-2:25)

P13.1
A PRELIMINARY SURVEY OF THE AMPHIBIANS AND REPTILES OF LAKE THOREAU

Marks McWhorter, Jennifer Lamb, Carl Qualls, Aimee Thomas
The University of Southern Mississippi, United States

Lake Thoreau Environmental Center comprises over 130 acres of Longleaf forest, open woodlands, swamps, and lake environs, representing many of the habitats seen throughout south

Mississippi. This center, which is being developed as a research and teaching facility, was founded to promote biological literacy and environmental education in the Hattiesburg area. The objective of this study was to sample habitats throughout the site and determine which species of reptiles and amphibians could be found throughout the year. We surveyed each habitat type at different times of the day and seasons. Aquatic sampling was done by placing minnow traps along the periphery of aquatic habitats, and hoop-net traps partially submerged in the shallows. Dip nets were also used to collect individuals. Terrestrial habitats were sampled through field observations and hand collecting. Anuran species were identified by hand collecting and/or call surveys. In the future, these results will be compared with range maps of species endemic to the area. Upon completion of this project, we will create a species account list of the amphibians and reptiles of Lake Thoreau. Those species native to the region and habitat type, but not surveyed, will also be included in the list but labeled as a species not identified through observations. Botanical and ornithological surveys have already been conducted, and other biological disciplines will be surveyed in the future.

P13.2
WATER QUALITY STUDIES OF OKITANKWO RIVER IN IMO STATE, NIGERIA.

Peter Okorie[1], Alex Acholonu[1], Vivian Ekwuruo[1]
[1]Imo State University, Nigeria, [2]Alcorn State University, United States

Okitankwo River is part of the Imo River drainage basin, one of the three largest river basins in south-eastern Nigeria. The river is seasonal; active during the rainy season (May - November) but get reduced to isolated water pools during the dry season (December- April). The river forms an arc on the northern periphery of Owerri municipality of Imo State along a course with relatively sparse human population, but active agricultural activity. Since the river is used for various domestic applications, this study was carried out as part of a general monitoring of the river's chemical characteristics. The chemical parameters investigated were dissolved oxygen, carbon dioxide , ammonia - nitrogen , zinc , pH, phosphate , sulphide , silica , chloride, nitrate-n, hardness and alkalinity. The results were compared with WHO/ EPA and U.S Public Health Service (PHS) water standards. Apart from the transparency that was low due to siltation, none of the parameters exceeded WHO/ EPA threshold. However, the phosphate level was relatively higher than the U.S PHS threshold, perhaps due to intense agricultural activities on the river floodplains. The results tend to suggest that the river is, at present , not under a serious threat from chemical pollution. It is recommended that the river be periodically dredged to prevent an eventual total siltation and blockage of the river bed.

P13.3
ASSESSMENT OF GROUNDWATER QUALITY IN OWERRI MUNICIPALITY, NIGERIA

Peter Okorie[1], Alex Acholonu[1], Chidiebere Onyemaechi[1]
[1]Imo State University, Nigeria, [2]Alcorn State University, United States

There is growing concern about the possibility of groundwater contamination in oil producing areas of Nigeria as a result of intensified oil exploitation and other human activities. This study of chemical parameters of groundwater in Owerri municipalitity was carried out as part of a general evaluation and monitoring of water resources in Imo state of Nigeria. Borehole water samples from three sites of potentially different hydrological characteristics in Owerri municipality were analysed for chromate, iron , zinc , phosphate, chloride , dissolved oxygen, silica , ammonia ,pH ,hardness , phenolphthalein alkalinity, carbon dioxide and nitrate. None of the water quality criteria in the study exceeded World Health Organisation (WHO) water quality standards. Also, the values of the water quality criteria in the three sites showed remarkable similarity, except for hardness and chloride content which showed some differences in the locations. Recommendations are made on firmer Government regulations on exploitation of groundwater resources.

.

ABSTRACTS RECEIVED AFTER DECEMBER 1O, 2010

Poster in Psychology Division

FURTHER EVIDENCE FOR THE CONSTRUCT VALIDITY OF THE COMPETITIVE PROSOCIAL/AGGRESSION CONTINUUM TASK

Alexander Biondolillo, Tammy Greer, Shirley Hodges, Jenny Morris, Joshua Bowling, Briana Edison, Kyle Nixon, Troy Yost
University of Southern Mississippi

Laboratory aggression paradigms have had a profound influence on and have provided much insight about the study of aggression; however, they are typically limited to aggressive spectrum responses without any opportunity for prosocial responding. The Competitive Prosocial/Aggression Continuum Task (COMPACT) was designed as a portable competitive reaction time paradigm that expands the range of available responses to allow for prosocial responding by utilizing both aversive and pleasant auditory stimuli. A sample of undergraduate college students N = 208 completed 20 trials of the COMPACT under the deception that they were playing a game against an online opponent. The COMPACT measures aggressive/prosocial responding on four behavioral measures: the mean of sound level selections across trials, the frequency of maximum aggressive response selections, the frequency of maximum prosocial response selections, and sound level selected on the first trial. Significant relationships were observed between COMPACT measures and aggression self-report scales, including measures of physical aggression, verbal aggression, anger, and a history of experiencing negative consequences due to aggressive behaviors. These results are consistent with previous research on the validity of the COMPACT as a behavioral measure of aggression. The results were not consistent with previous results exhibiting a correlation between prosocial responding on the COMPACT and a measure of prosocial tendencies. Further modification may be necessary before pleasant response options on the COMPACT can be considered a reliable and valid measure of prosocial behaviors as opposed to a degree of non-aggressive responding.

ATTITUDES TOWARD TERRORISM AMONG COLLEGE STUDENTS

Noppe, Illene, Skitka Linda, Herron, Kerry, Jenkins-Smith, Hank
Tougaloo College, Jackson, MS

Poster in Health Sciences Division

Effects of a High Salt Diet on the Progression of Renal Injury in Diabetic Dahl Salt-Sensitive Rats

Jerica Brown[1], Adrienne Wells[2], Patrick B. Kyle[3], Richard J. Roman[2] and Jan Michael Williams[2]
Tougaloo College, Tougaloo MS (REO Program) and Departments of Pharmacology and Toxicology and PathologyUniversity of Mississippi Medical Center, Jackson MS

Oral Prestentation in Agricultural Division
Thursday Feb 17, 2011

2:30
THE EFFECTS OF PLANT DENSITY ON VETIVERIA ZIZANIOIDES (VETIVER GRASS) BIOMASS PRODUCTION AND CHEMICAL COMPOSITIONS

Phraubrandi Magee, Patrick Igbokwe, Joseph Jackson
Alcorn State University

Oral Presentation in Chemistry
Friday, Feb18, 2011
11:50
LIGAND IN SELECTIVE CYCLOPROPANATION REACTIONS

Caitlyne Shirley Douglas Masterson
University of Southern Mississippi, Hattiesburg, MS

Copper-coordinated, di-substituted ligands of [2.2]paracyclophane ([2.2]PCP) have been successfully utilized to synthesize enantiospecific cyclopropanes. However, in comparison to mono-substituted ligands, they are difficult to synthesize. Mono-substituted ligands of [2.2]PCP are simple to synthesize, but have free rotation around the C-N bond, so they do not perform enantiospecific reactions. However, if a bulky ligand is attached to [2.2]PCP, theoretically the ligand should perform the enantiospecific cyclopropanation reactions desired. The ligand was synthesized with standard organic synthesis techniques. The enantioselective reaction was tested for success using HPLC-MS, with negative results. The conclusions drawn from this were that the mono-substituted ligand of interest did not enantiospecifically synthesize the cyclopropane, although the reasons for this outcome are still being analyzed.

Index of Authors