

# PROGRAM & ABSTRACTS

**5<sup>th</sup> Annual Symposium  
Graduate Research and Scholarly Projects**

**9<sup>th</sup> Annual Forum  
Undergraduate Research and Creative Activity**



May 1, 2009  
Eugene Hughes Metropolitan Complex

Mara Alagic, GRASP Chair  
D. Paul Rillema, URCAF Chair

# 2009 GRASP SYMPOSIUM

## *Editorial Board*

*Chair:* Mara Alagic, Associate Professor & Graduate School Assistant Dean  
Anthony Dilollo, Assistant Professor, Communication Science & Disorders  
Patricia, Dooley, Professor, Elliot School of Communication  
Kathy Downes, Associate Dean, University Libraries  
Annette Lezotte, Assistant Professor, School of Art & Design  
Ken Miller, Professor & Graduate Coordinator, Mathematics  
Sue Nyberg, Assistant Professor, Physician Assistant (Health Professions)  
Jeremy Patterson, Assistant Professor, Human Performance Studies  
Jodi Pelkowski, Associate Professor, Economics (Business)  
Jay Price, Associate Professor, History  
T.S. Ravigururajan, Associate Professor, Mechanical Engineering  
Edwin Sawan, Chairperson and Professor, ECE

### *Sponsors:*

Graduate School  
Office of Research Administration  
University Libraries

# 2009 URCA FORUM

## *Organizing Committee*

*Chair:* D. Paul Rillema, Professor, Chemistry, LAS  
Robert Bulp, Assistant Professor, Art and Design, Fine Arts  
Kyoung Lee, Assistant Professor, School of Social Work LAS  
Jeremy Patterson, Assistant Professor, Human Performance Studies, Education  
Maria Torres Pillot, Associate Professor, Health Professions  
Atul Rai, Assistant Professor, School of Accountancy, Business  
Larry Whitman, Professor, Ind. and Manufacturing Engineering  
Ginger Williams, Assistant Professor, University Libraries

### *Sponsors:*

Office of Research Administration  
University Libraries  
Fairmount College Liberal Arts and Sciences  
College of Education

5<sup>th</sup> Annual Symposium  
**Graduate Research and Scholarly Projects–GRASP**

9<sup>th</sup> Annual Forum  
**Undergraduate Research and Creative Activity Forum–URCAF**

*Note: All Break/Poster Sessions are in Gymnasium*

Opening Session in Lowe Auditorium	
8:00 – 8:30	<b>Registration</b>
8:30 – 8:45	<b>Opening Remarks</b> <b>Provost &amp; Vice President Miller, Professor Rillema</b>
<b>Keynote Address</b>	<b>Paul H. Wooley, PhD</b> Director, Orthopedic Research Institute; Professor of Biology, WSU; KBA Eminent Scholar  <i>Merging Aerospace and Orthopedic Science – Can a hip implant fly?</i>
8:45 – 9:15	A perspective of cross-discipline research to show what might be required by graduates merging biology, medicine and engineering.
9:15 – 9:30	<b>Refreshments and Poster Viewing in Gymnasium</b>

GRASP	
9:30 – 10:30	<b>Session 1 - Room 185</b>
10:30 – 10:45	<b>Break/ Viewing Posters</b>
10:45 – 12:05	<b>Session 2 - Room 185</b>
12:05 – 1:00	<b>Lunch/Viewing Posters</b>
1:00 – 2:30	<b>Session 3 - Room 185</b>
2:30 – 2:45	<b>Break/ Viewing Posters</b>
2:45 – 3:35	<b>Session 4 - Room 185</b>
3:35 – 4:15	<b>Break/ Viewing Posters</b>
4:15 – 5:00	<b>Awards – Room 132</b> <b>President Beggs</b>

URCAF	
9:30 – 10:30	<b>Natural Sci./Eng. Rm. 132</b>
10:30 – 11:30	<b>Social Sciences Rm. 132</b>
11:30 – 12:30	<b>Social Sciences Rm. 132</b>
12:30 – 1:30	<b>Lunch/ Viewing Posters</b>
1:30– 3:00	<b>Social Sciences Rm. 132</b>
3:15-4:15	<b>Awards Room 132</b>  <b>Associate Provost &amp; Graduate School Dean McDonald</b>

# URCAF ORAL PRESENTATIONS

<b>Moderator: Larry Whitman</b>			page
9:30	<b>Nola Reine</b>	Synthesis of a New Class of Carionic Water Soluble Porphyrins	9
9:45	<b>Brian Oney</b>	NORDAM: Part Tracking and Data Collection	9
10:00	<b>Darnell Webb</b>	Photochemical Properties of the Ruthenium-Tris (2, 2'-Bypyridyl) Dichloride Meta	10
10:15	<b>Michael Zollinger</b>	High Rotational Speed? Friction Stir Welding: Portable Crack Repair	10
<b>Moderator: Peter Zoller</b>			
10:30	<b>Amena Ballout</b>	The Correlation of Mental Health and Length of Homelessness Among the Homeless Population	11
10:45	<b>Sarah Bradbury</b>	Domestic Violence and the Duration of Homelessness	11
11:00	<b>Jaclyn Capps</b>	Impact Of Domestic Violence on the Length of Homelessness	12
11:15	<b>Allison Deiter</b>	The Duration of Homelessness and its Correlations to Mental Illness	12
11:30	<b>Christina Eaves</b>	Effects of Sociodemographic Factors on Intimate Partner Violence	13
11:45	<b>Amy Fowler</b>	Elliott Media Design Group's Branding and Web Design Concept for Southeast Carry	13
12:00	<b>Margery Hannah</b>	Informing a Literary Piece: Slavery and the Matriculation of African American Adolescents' Psyche	14
12:15	<b>Sarah Hedrick</b>	Substance Abuse and the Duration of Homelessness	14
1:30	<b>Caitlin Hendrix</b>	Impact of Drug and Alcohol Abuse on the Employment of Homeless People	15
1:45	<b>Donna Julian</b>	Depression, Anxiety, PTSD and the Employment of the Homeless	15
2:00	<b>Amy Fowler</b>	Proposal to Include Infertility Information in the State of Kansas' Human Health and Sexuality Curricula	16
2:15	<b>Kate Page</b>	Doubly Rebellious: Swashbuckling Women in the Golden Age of Piracy	16
2:30	<b>Adella Rucker</b>	The Ineffectiveness of Habitual DUI Offender Laws in the State of Kansas	17
2:45	<b>David Stowell</b>	Comparing Statistical Models with Image Reproduction	17

# GRASP ORAL PRESENTATIONS

<b>Moderator: David Eichhorn</b>			
9:30	<b>Ali Ahmady</b>	Identifying Users' Characteristics Critical to Product Selection Using Rough Set Theory	18
9:40	<b>Christina Bair</b>	Shoulder muscle EMG activity during push up on varying surfaces in women.	18
9:50	<b>Lisa M. Booth</b>	Commitment Communication and Length Of Marriage: The Seven-Year Communication Itch	19
10:00	<b>Kim Burkholter</b>	Teacher's Attitudes Toward Implementation of a Comprehensive School Reform Model in Two Urban Middle Schools	19
10:10	<b>Carrie Chambers</b>	Analysis of Differential Glycosylation Patterns of Human FSH	20
10:20	<b>Jon Christensson</b>	How Inflationary are Oil Price Shocks? A Regional Analysis	20
<b>Moderator: Mara Alagic</b>			
10:45	<b>Christina P. Coiner</b>	Potential Relationships Between Learning Styles and Memory Strategies	21
10:55	<b>Alisa Cotter</b>	Bad for Business: Luther Against the Papacy	21
11:05	<b>Karen Countryman-Roswurm</b>	Risk Factors and Interventions with Sexually Exploited HRTY	22
11:15	<b>Daiquirie Crumrine</b>	Speech-Language Pathologists' Self-Assessment of Knowledge Regarding Medications to Treat Behaviors Associated with Autism Spectrum Disorder	22
11:25	<b>Johann Dorfling</b>	Statistical Presentation of the Flight Environment of the Propellers on Commuter Aircraft	23
11:35	<b>Natalie S. Grant</b>	Parental Involvement in a Rural Consolidated School District	23
11:45	<b>Shamsuzuha Habeeb</b>	Crack Arrest Capabilities in Adhesively Bonded Skin and Stiffener	24
11:55	<b>Linda Hoffmann</b>	Multivariate Isotonic Regression and its Algorithms	24

**Moderator: Stuart Lasine**

1:00	<b>Waseem Khan</b>	Dielectric Properties of MWCNTs Reinforced Polyacrylonitrile (PAN) Nanofibers at Varying Temperatures	26
1:10	<b>Felecia Lee</b>	Assessing The Career Aspirations, Family Structure And Ability To Succeed Among African-American Males	25
1:20	<b>Jodi Lightner</b>	Postmodern Places	26
1:30	<b>Lisa Lutz</b>	A Districts' Perceptions: Necessary Skills in the 21st Century	26
1:40	<b>Justin Lygrisse</b>	Detection and Quantification of Ketamine HCl in alcoholic drinks using Mass Spectrometry and Liquid Chromatography	27
1:50	<b>Emily J. McDonald</b>	A Survey of Pharmacist Participation in Trauma Resuscitation	27
2:00	<b>Jessica A. Puyear</b>	Depositional and Structural History of the Sedgwick Basin, South Central Kansas in Relation to Petroleum Entrapment	28
2:10	<b>Nasser Safaie</b>	A Bayesian Approach to Detect a Shift in Process Average	28
2:20	<b>Phillip R. Sechtem</b>	Recursive Frame Analysis of Physician-Patient Interactions: A Pilot Study	29

**Moderator: Jeremy Patterson**

2:45	<b>Megan Simpson</b>	DNA Methylation and its Role in a Form of Hormone-Dependent Cancer	29
2:55	<b>Julinda Taylor</b>	Data Caching in Ad Hoc Networks using Bloom Filters	30
3:05	<b>Renee L. Vardy</b>	The Study of the Effect of Long Term Water Cover on the Mill Tailings of the Silver Lake Mill # 1, Near Silverton, Colorado	30
3:15	<b>Joy H. Vetter</b>	Sexual Dimorphism of the Iliac Crest: A Quantitative Approach	31
3:25	<b>Kristen Waymire</b>	Dynamics of Gender Ideology of Hamas	31

**URCAF POSTER PRESENTATIONS****Moderator: Larry Spurgeon**

UP1	<b>Keshia Ezerendu</b>	Old Town to New: the Other Side of Wichita	32
UP2	<b>Amanda Barr</b>	Influence of Informational Video Elements on Breast Cancer Treatment Decisions	32
UP3	<b>Stephanie Curtice</b>	Exploring Fragmentation of Gas-Phase Peptide Ions	33

UP4	<b>Janani Gopu</b>	Synthesizing Drug-Carrying Nanocomposite Sphere For Targeted Drug Delivery	33
UP5	<b>Janani Gopu</b>	Synthesis of Ferrofluids at Controlled Ph	34
UP6	<b>Kalisha Fisher</b>	Limited Life By Abuser Control	34
UP7	<b>Dona Liyanage</b>	Electrocatalytic Reduction of Oxygen by Water Soluble Cobalt Porphyrin	35
UP8	<b>Aaron Mahoney</b>	Linking Seed Leachate with Negative-Density Dependent Germination in Sericea	35
UP9	<b>Susan P. McCoy</b>	Spirituality/Religiousness and the General Well-Being of Older Adults	36
UP10	<b>Alexandra Melocco</b>	Mixed Nitrogen Sulfur Donation To Nickel(Ii) Centers: Models for the Active Site	36
UP11	<b>Mohd Firdauze Mohtar</b>	Control Of Binding Modes Of Cationic Water Soluble Porphyrin Interactions with DNA	37
UP12	<b>KimNgoc Nguyen</b>	Substance Abuse and the Length of Homelessness (or Recidivism of Shelter Use)	37
UP13	<b>Eric Oweggi</b>	Catechol Appended Fullerene as a Building Block for Supramolecular Donor-Acceptor Hybrids	38
UP14	<b>Sean Ritterhouse</b>	CS1 Pilus Chaperone Protein Coob Characterization	38
UP15	<b>Anthony-Minh Vu</b>	Experimental and Theoretical Study of Competing Dissociation Pathways of Modified Glycine Methyl Esters	39
UP16	<b>Sarah Young</b>	Structure and Fragmentation Behavior of Metal-Cationized Phosphopeptides	39

## GRASP POSTER PRESENTATIONS

GP1	<b>J. F. Acosta</b>	Tensile Pulse Generation Techniques in a Split Hopkinson Bar	40
GP2	<b>Sahar B. Amini</b>	First Step to Active Health - Online Plus: Pilot Study	40
GP3	<b>Ashley M. Archiopoli</b>	Not Dying from Disease: A narrative analysis of HIV/AIDS in the film Rent	41
GP4	<b>Jessica Baumchen</b>	Near Infrared Spectroscopy Measurement of Sacral Tissue Oxygen Saturation (StO2) in Healthy Volunteers	41
GP5	<b>Megan Bengtson</b>	Measuring the Physical Activity Level of Two Children with Combined Cerebral Palsy and Intellectual Disability	42

GP6	<b>Kristen A. Bernard</b>	Quantifying Male and Female Shape Variation in the Mastoid Region of the Temporal Bone	42
GP7	<b>Jennie Carlgren</b>	Effects of Lower Trapezius Muscle Strengthening Exercises	49
GP8	<b>John Carter</b>	Effects of Dynamic Warm-up With and Without a Weighted Vest on Lower Extremity Power Performance of High School Male Athletes	43
GP9	<b>Ryan P. Dain</b>	What Does That Molecule Look Like? Using Tandem Mass Spectrometry, Computational Chemistry and Vibrational Spectroscopy to Determine Molecular Structure	43
GP10	<b>Sushanta K Das</b>	Synthesis of CdTe Quantum Dots of Different Sizes and their Interactions with Water Soluble Porphyrins	44
GP11	<b>Amber N. Droegemeier</b>	The Relationship of Plantar Flexor Strength to Functional Balance in Older Adults	44
GP12	<b>Oliwier Dziadkowiec</b>	Member Retention in Consumer-Run Organizations	45
GP13	<b>Sana Fazal Elyas</b>	Trigger Mechanisms of Progressive Crushing – Energy Absorption in Flat Plate Fiber-Reinforced	45
GP14	<b>R.A. Ewing</b>	Possible Ageism in the Aggressiveness of Severe Sepsis Treatment	46
GP15	<b>Andres Reyes Gaige</b>	Molecular Interactions between <i>Medicago truncatula</i> and <i>Macrophomina phaseolina</i>	46
GP16	<b>Jason C. Gifford</b>	Correlation and Predictability of Science Prerequisites and GPA/PANCE Scores Among 5 Cohorts of Physician Assistant Students	47
GP17	<b>Amanda Ginther</b>	Survey of Psychiatric Physician Assistants Determining Scope of Practice, Preparedness, and Post-Graduate Training	47
GP18	<b>Emily A. Grant</b>	An Examination of Becoming a Mental Health Certified Peer Specialist	48
GP19	<b>Debra Greenwood</b>	Physical Therapist Clinical Instructor Perceived Benefits and Reservations of the Clinical Instructor Role	48
GP20	<b>Jennie Carlgren</b>	Effects of Lower Trapezius Muscle Strengthening Exercises	49
GP21	<b>Jason Harader</b>	Tympanometric Measures in Human Ears with Negative Middle-Ear Pressure	49
GP22	<b>Gami Hiren</b>	An Efficient Carrier Offset Estimator for OFDM System	50
GP23	<b>Lukas Hulsey</b>	Effectiveness and Invasiveness in Patient Medical Decision Aids	51
GP24	<b>Brad M. Jeffrey</b>	Facies Characterization and Mechanism of Termination of a Tertiary Carbonate Platform: Rajamandala Fm., West Java, Indonesia	51

GP25	<b>M. Jones</b>	An Evaluation of Indirect Interactions Between Herbivore Guilds: Effects of Meristem Miners on Flower Head Feeders	52
GP26	<b>L. Karim</b>	Trunk Stability with abdominal draw-in exercise versus abdominal bracing exercise	52
GP27	<b>Shane Katz</b>	Static and Dynamic Warm-up in Upper Extremity Functional Activities	53
GP28	<b>Justin Kelley</b>	Relationships of Demographic Background And Practice Setting Among Practicing Physician Assistants in the US	53
GP29	<b>Dale Kerstetter</b>	Comparison of Dissociation Tendencies of meta- & para-trifluorotolylglycine methyl esters and meta- & para-tolylglycine methyl esters in ESI-MS	54
GP30	<b>Tan Kian Yip</b>	Progressive Crushing Energy Absorption Capabilities of Glass Fiber-Reinforced Corrugated Panel	54
GP31	<b>Chris Kirk</b>	Empowering the Disenfranchised: Creating College Access for Foster Care Youth	55
GP32	<b>Zach Koch</b>	Paleoenvironmental Interpretation of the Bandera Shale Formation, Marmaton Group, Desmoinesian Stage, Middle Pennsylvanian in Southeastern Kansas	55
GP33	<b>Zachary Kral</b>	Damage Detection in Metal Structures Using Acoustic Emission	56
GP34	<b>Joe Leonard</b>	Rendering Toxic Metal Oxides Inert	56
GP35	<b>Masako Maeda</b>	Peer Reviews of Teaching: Are They Useful?	57
GP36	<b>Qasaymeh M. M</b>	Blind Carrier Frequency Offset Estimator for Discrete Multi Tone System	57
GP37	<b>Eranda Maligaspe</b>	Energy Transfer Followed by Electron Transfer in a Supramolecular Boron Dipyrrin-Zinc Porphyrin-Fullerene	58
GP38	<b>Pratap Nuggehalli Nandakumar</b>	Load Rate Effects on Interlaminar Fracture Toughness of Composite Materials	58
GP39	<b>Pamela K. O'Neal</b>	Transparency and Readability Assessments of Childhood Obesity Websites	59
GP40	<b>Rohitha Paruchuri</b>	Numerical Modeling Of Boiling in Microchannels	59
GP41	<b>Jelena Petrovic</b>	Cybernetic answer to who, what, where, when and how: Comparative analysis of online and print newspapers in Serbia, Great Britain and the United States	60
GP42	<b>C. Adam Probst</b>	Physician Individual Differences Related to Willingness to Use a Computer-Based DSS	60

GP43	<b>Bobby L. Rozzell</b>	Wichita “Tweeters” about the 2008 Presidential Election: Fantasy Theme Analysis of Messages During Three Election Night Time Phases	61
GP44	<b>Kristi Santry</b>	Which Way Are You Looking?: Establishing Eye-Direction Detection in Children with ASD	50
GP45	<b>Kylea Schrag</b>	Free-Time Leisure Activities	61
GP46	<b>H. Shatnawi</b>	An Improved Frequency Estimator	62
GP47	<b>Mindy L. Slimmer</b>	Impact of the First Step to Active Aging on Older Adult’s Functional Fitness, Balance, and Daily Activity	62
GP48	<b>Navaneetha Subbaiyan</b>	Electropolymerization of Triphenylamine appended Zinc Porphyrin to form Porphyrin-Fullerene dyads at the electrode surface for photochemical studies	63
GP49	<b>Matthew A. Swanson</b>	Physician Assistant and Physician Assistant Student Exposure to and Perceptions of Pharmaceutical Representatives in the Clinical Setting: A Pilot Study at Wichita State University	63
GP50	<b>Masaaki Takahashi</b>	Design and Implementation of a Web Service for LiteOS-based Sensor Networks	64
GP51	<b>Anja K. Talley</b>	Attitudes of United States Physician Assistants towards Persons with HIV/AIDS	64
GP52	<b>Chigozirim Utah</b>	The anatomy of teenage cliques: Communication behavior at the 2008 Kansas State Fair and in popular media	65
GP53	<b>Bharadwaj Veera Raghavan</b>	Tensile Stress Concentration due to Counter Sunk Holes in Adhesively Bonded Layered Aluminum	65
GP54	<b>Yaamunan Venkatesan</b>	PEM Cells-Performance, Durability and Role in Energy Storage	66
GP55	<b>H.L Wamocho</b>	Synthesis and Biological Evaluation of Drug-Carrying Magnetic Nanocomposite Particles for Targeted Drug Delivery	66
GP56	<b>Shoshana Wernick</b>	Evaluating a Community Health Center’s Diabetes Project: A Strategy to Reduce Health Disparities	67
GP57	<b>Channa A. Wijesinghe</b>	Sequential Energy Transfer Followed by Electron Transfer in Newly Synthesized Molecular Tetrads.	67
GP58	<b>Ryan Todd Wilkin</b>	Case Report: Nitrofurantoin-Induced Pulmonary Toxicity	68

## Synthesis of a New Class of Cationic Water Soluble Porphyrins

Nola Reine

*Department of Chemistry*

In recent years water soluble cationic porphyrins have gained increased attention based on their wide range of applications that include telomerase inhibition, DNA binding, and cleavage, photodynamic therapy of cancer, chirality sensing, and as Magnetic Resonance Imaging contrast agents. The central metal ion in the cavity and cationic peripheral substituents are deemed to be important in these various applications. Hence, development of new class of cationic water soluble porphyrins is of immense interest. In the present study, we report the synthesis and characterization of a new class of water soluble cationic porphyrins, meso-tetrakis (N-methylimidazolium) porphyrin and its zinc derivative.<sup>1</sup> The meso-tetrakis para imidazolium porphyrin are synthesized by condensation of pyrrole with 4-(1H-imidazol-1-yl)-benzaldehyde followed by purification on column chromatography. The free-base porphyrins were metallated using zinc acetate and followed purification. Treatment of the zinc porphyrins with methyl iodide at elevated temperature afforded cationic water soluble porphyrins. The newly synthesized porphyrins are characterized by various spectroscopic and electrochemical methods, and their usage in the above mentioned applications is being sought out. Preliminary studies reveal that these porphyrins are able to bind to DNA as observed by optical absorption and emission spectroscopy, circular dichroism and gel electrophoresis studies.

## Nordam: Part Tracking and Data Collectors

Brian Oney

*Department of Industrial and Manufacturing Engineering*

The NORDAM Group Inc.'s Wichita facility produces business jet interiors and they expect eighty percent growth in demand over the next two years. NORDAM uses tracking cards to track individual parts and collect data throughout their finishing process. However, currently this data is underutilized and inaccurate, thus NORDAM is not sure they can accommodate their expected growth. The objective of this project was to evaluate alternatives for data collection and at the part level in NORDAM's finishing process. A few methods were used to achieve these objectives including modeling and cost analysis. By using these methods we created a process map for the current state, identified important system design criteria with a capabilities matrix, and performed a cost analysis including a sensitivity analysis. We assessed four alternatives: Do Nothing, Hire One Indirect Head, Bar Code with Database, and Radio Frequency Identification (RFID) with Database. The cost analysis showed that the Bar Code with Database alternative provided the highest uniform equivalent annual value (UEAV) of \$583,196. The sensitivity analysis showed that this alternative remained the superior choice, six percent better than Do Nothing and three percent better than RFID, with no regard for changes in number of units or build hours per units. Based on the capabilities matrix and the minimal difference between the Do Nothing, Bar Code with Database, and RFID with Database alternatives, we recommend that NORDAM implement the RFID with Database alternative. RFID with Database is the only alternative that provides every capability that NORDAM had indicated they need and it provides enough tangible benefits to help offset its higher initial cost.

## Photochemical Properties of the Ruthenium-Tris (2, 2' Bypyridyl) Dichloride Meta

Darnell R. Webb and D. P. Rillema  
*Department of Chemistry*

Ruthenium-tris (2, 2'-bypyridyl) dichloride exhibits an emission maximum at 600 nm in solution and at 590 nm in a glass at liquid-nitrogen temperature (77K) with an emission lifetime of 2300 ns compared to 600 ns at room temperature. In this project, the metal complex was incorporated into a sugar glass (dextrose) in order to determine if its emission lifetime at room temperature would be similar to that at liquid-nitrogen temperature in the solid glass. The sugar glass was prepared by literature procedures and emission was ascertained by using an emission spectrophotometer. Emission lifetimes were determined using a pulsed Nd:YAG laser spectrometer having a pulse width of 5ns. In the presence of the sugar glass, the ruthenium (II) complexes exhibited an emission lifetime of 955 ns with an emission maximum at 590 nm. The results will provide a matrix for rapid determination of emission properties of this complex at room temperature

## High Rotational Speed Friction Stir Welding: Portable Crack Repair

Michael Zollinger  
*Mechanical Engineering Department*

The scope of this project is to design and produce a portable HRS-FSW machine that is able to do in-situ repairs for small cracks. The critical issues for this include, but are not limited to, the machine weight, downward (lateral) force to induce weld, and the tool retraction hole. Due to the nature of friction stir welding, a balance of rotational speed, downward force, and feed rate need to be considered. Using very high rotational speed, 18,000 - 24,000 rpm in this case, we are able to drastically reduce the amount of downward force needed to produce a weld to roughly 400lbs (rather than several tons). Using this concept, the possibility of designing a portable friction-stir welding machine for crack repair becomes possible. Finally, producing a pin retraction feature will allow the end-user to have minimal clean-up work when the weld is completed; no pin hole will be left in the material if the tool is removed smoothly.

## Health and the Length of Homelessness among the Homeless Population

Amena Ballout, Stephanie Bodkins, Rebecca Boos, Sarah Donnelly, Loretta Williams  
*School of Social Work*

While homelessness and mental illness are among the most significant social problems in the United States today, much is still unknown about how mental illness affects the lengths of homelessness. Previous studies have not directly linked mental illness of a person with their length of homelessness. The objective of this study is to examine the correlation of mental illnesses among the homeless population and the length of their homelessness. *Methods:* This research study is a quantitative survey study conducted by face-to-face interviews and utilizes the cross-sectional design method. Non-probability and purposive sampling methods were used to generate the chosen participants. A total of 100 subjects were interviewed between the middle of March to the middle of April. All participants were recipients of eight homeless agencies that provide services to the homeless in Kansas. A structured surveyed questionnaire was used to measure the main dependent variable which is length of homelessness. The questionnaire included multiple scales to measure the independent variable, mental health. *Results:* Regression analysis will be used to find the results of the study. The expected results of this study will show that the length of homelessness will increase if mental health problems are higher. *Implications:* The significance of this study is to provide important information for caseworkers working with the homeless population and the possibility of establishing new homeless and mental health services at shelters. The goal is to enable the homeless population to manage their mental illness by providing them services that will empower them to become self-sufficient.

## Domestic Violence and the Duration of Homelessness

Sarah Bradbury, Tammy Bradbury, JoAnna Kavanah, Micheal Randle, Janea Putman  
*School of Social Work*

Homelessness is a growing problem in today's society. This study links the length of homelessness and domestic violence. Unlike any other study this study will show domestic violence as a cause of homelessness in today's society. This study will examine the effect domestic violence has on the length of homelessness. *Methods:* The method used to obtain this information is a cross-sectional survey study. To collect the samples the method of purposive sampling was used. This type of sampling is used when the researcher uses their own judgment to select sample members. One hundred homeless individuals were surveyed in order to conduct this study. The participants were adult male and females from the State of Kansas residing in homeless shelters. The participants for this study were all voluntary and did not receive any type of compensation. This survey was conducted in a one month span from mid-March to mid-April. There are a total of eight agencies in Kansas that participated in this study. The independent variable of domestic violence was measured through domestic violence scale from University of Michigan. The dependent variable measuring the length of homelessness will be shown through a survey question using the SPSS program. *Results:* The results will show the prevalence of domestic violence in a household can lead to the longer length of homelessness. *Conclusion:* The study is important to society by increasing self-sufficiency of the homeless by giving more information to the care givers and social workers regarding practice and policy

## Impact of Domestic Violence on the Length of Homelessness

Jaclyn Capps and Stephani Crusinbery  
*School of Social Work*

There are many factors that contribute to one's homelessness. Studies have been completed examining many of these aspects; however, this study will specifically examine the relationship between domestic violence and the length of homelessness. Given the negative repercussions homelessness has on the greater society, it is crucial to examine the factors that contribute to one's homelessness, more specifically domestic violence. This research shows the relationship between the domestic violence one experiences and subsequent homelessness. *Methods:* This study will utilize a cross-sectional survey design. The participants will be selected in a purposive sampling method. The study will be comprised of around 100 participants who will be surveyed from the middle of March to the middle of April. The study will include eight agencies in Kansas. The survey will measure the dependent variable by asking a survey question about the length of homelessness one has experienced, followed by questions regarding the independent variables. The independent variable questions will inquire about the severity of domestic violence one has experienced using the Domestic Violence Scale by the Survey Research Center of The University of Michigan. *Results:* This research will be utilizing regression analysis. These researchers expect to find a positive correlation between domestic violence and the length of homelessness. *Implications:* This research hopes to provide information for the prevention and education of domestic violence issues. The results of this research would be advantageous for the social workers, shelters, and agencies who work with the homeless and victims of domestic violence by educating them on the impacts domestic violence has on its victims.

## Duration of Homelessness and its Correlations to Mental Illness

Secilia Owens, Allison Deiter, Jessie Foust, Darci Weiland  
*School of Social Work*

This study will examine the relationship between the mental health, recidivism and length of homelessness. The strength of this study is that it is representative of the surrounding population in Kansas. Also, many studies look at the cause of homelessness, but not how the cause affects the length of their homelessness. This study should answer whether mental health has an effect on the length of homelessness and what services would then need to be provided to our clients to help them overcome homelessness. *Methods:* This study is a cross-sectional survey study with purposive sampling. There are around one-hundred participants in this study. Surveys were given from the middle of March to the middle of April. Eight homeless agencies were visited in Kansas. The participants were asked survey questions about their homelessness. To measure depression, this study will use the CES-D scale. GAD-7 scale was used to measure anxiety. The PTSD scale was used to measure PTSD. *Results:* This study expects the results to show there is a relationship between mental health problems and the length of homelessness. Results will be analyzed using regression analysis. *Implications:* This subject is very important to the social work field because the information obtained will lead to an understanding of what contributes to the problems the homeless population face.

## Effects of Sociodemographic Factors on Intimate Partner Violence

Christina Eaves

*Department of Psychology*

The phenomena of Intimate Partner Violence (IPV) and its relationship to socio-demographic factors in a mid-west city were investigated in this study. A mixed-method approach using qualitative and quantitative methods in order to examine the relationship between IPV and various socio-demographic factors was employed. Qualitative data was collected through semi-structured interviews, using a purposive sample of seven key informants: treatment providers, law enforcement, and various city employees including judges, court appointed liaisons, and criminal defense investigators. Quantitative data was obtained from the local police department and consisted of publicly available incident and arrest records from 2000 to 2007. Major findings show that between 2003 and 2004 there was a decrease in total arrests and from 2004 and 2005 there was a dramatic increase in total arrests. This study found that community-wide education about the causes of IPV and its link to drugs and alcohol are keys to prevention and treatment. This study recommends strategies for creating greater community awareness including programs that teach victims and perpetrators how to recognize and defuse triggers of violence. The implications for policy changes in dealing with perpetrators are also discussed and alternatives to current law enforcement responses are presented; these approaches focus on rehabilitation in order to reduce recidivism.

## Elliott Media Design Group's Branding and Web Design Concept for Southeast Carry

Amy Fowler

*Elliott School of Communication*

The Elliott Media Design Group (eMDG) formed in the spring of 2009, with a focus on media, and an emphasis on design. eMDG's clients for this project were Andy and Brenda So, owners of Southeast Carryout. The Sos sought to expand their advertising capabilities by capitalizing on the ever-burgeoning popularity of computer-based technological media. The purpose of this project was to satisfy this request with the creation of a fully-functioning electronic media package, to include, but not limited to, a website, companion fan sites, and printable supplements. As a group of six, we split the project duties. Some in our group had design and website creation experience, others' strengths lay in different areas. We met with the Sos several times during the project period, to get their input and refine our designs. By the time the project was due, we felt we had captured the look and feeling that the Sos wanted their electronic media package to convey. We are exceptionally pleased with our end-product for this project. In order to complete this assignment, we had to manage task functions, and maintenance functions, while eliminating self-centered functions. There were a few difficulties along the way, but in the end, our team produced the concept the Sos ultimately chose for their new look. eMDG's website and companion fan sites will go live soon. We continue to work with the Sos to make our concept a reality.

## Informing a Creative Piece: Psychological Slavery and the Matriculation of African American Adolescent Males in the Midwest

Hannah Margery  
*Department of English*

This investigation explores the relationship between American slavery and modern African American male adolescent psyche in reference to high school matriculation. There are three research questions: are African American adolescent males who internalize an awareness of systemic oppression through esteem and identity more likely to graduate? Are African American adolescent males who are insubordinate to mainstream influences more likely to graduate? And are African American adolescent males who relate educational success with financial success more likely to graduate? An examination of previous studies identified low self-esteem and identity issues as factors in low rates of high school graduation among young black men; however studies failed to provide tested data on identity perception as defined within the context of this investigation. A methodical query assessing identity, esteem, and self-perception as informed by student, family, and school characteristics is needed to clearly answer the proposed questions, as well as to inform a creative piece. Findings will be used to construct a literary piece using interwoven vignettes from the perspectives of two African American adolescent males.

## Substance Abuse and the Duration of Homelessness

Sarah Hedrick, Christina Jarchow, Ashley Emley, Carmen Aguilar,  
Krystal Stewart.  
*School of Social Work*

The study intends to find if there is a correlation between substance abuse and the duration of homelessness. Although there have been numerous studies done regarding substance use and homelessness, there has not been any published research done to determine if substance abuse causes a longer duration of homelessness. This study intends to find if and why there is a correlation between substance abuse and the duration of time someone stays homeless. *Methods:* This study uses the non-probability purposive sampling method to select subjects to be surveyed between March and April. The subjects are 100 homeless individuals living in eight different shelters in Kansas. To find if substance abuse has an effect on the length of homelessness, we will use the quantitative method, and the cross-sectional method to find the correlation between the two. This study uses a structured survey questionnaire to measure how the length of homelessness correlates with drug and alcohol dependency. The survey questionnaire includes questions regarding demographics, employment, housing, and any self reported health issues the subjects may have. This survey also includes the Drug Abuse Screening Test (DAST) and Short Michigan Alcoholism Screening Test (SMAST 13) scales to measure the severity of Drug and Alcohol dependency in the subjects. *Results:* Using multivariate regression method, this study expects to find a significant relationship between substance abuse and the length of homelessness. *Implications:* The research will benefit the homeless people by analyzing the findings in order to develop programs within agencies serving the homeless population.

## Impact of Drug and Alcohol Abuse on the Employment of Homeless People

Caitlin Hendrix, Adrian Price, Leila Garoutte, Jenny Harbaugh, Letitia Talbot  
*School of Social Work*

This study is designed to determine a correlation between substance addictions and unemployment amongst the adult homeless community in Wichita, Kansas. This is unique because we are evaluating the relationship between two correlating and predominate ailments, whereas other studies' focal point is directed toward the effects of only one variable in relation to homelessness. Also, this study is being conducted in a smaller Midwest city, rather than a booming metropolis where the majority of the homeless population studied are evaluated and documented. This study hopes to determine whether substance abuse affects homeless peoples' ability to obtain or maintain employment. *Methods:* This study is a cross-sectional survey study with the use of non-probability and purposive sampling. The sample size consists of 100 subjects and the subject interview period will occur between mid-March and mid-April. Subjects are selected from eight agencies in Wichita and the immediate surrounding area. Dependent variable (employment of homeless people) will be measured using a close-ended survey question and the independent variables (drug and alcohol abuse) will be measured using the DAST and SMAST-13 scales. *Results:* Expected results include a strong relationship between substance abuse and unemployment amongst the homeless population. *Implications:* Benefits include a more expansive knowledge and understanding of the homeless community; assist the shelters in identifying direct care needs, and assist social workers in developing more effective interventions for the homeless population.

## Depression, Anxiety, PTSD and the Employment of the Homeless

Donna Julian, Shannon Everette, Deandra Hester, Mary Ternes, Christy Hurd  
*School of Social Work*

Many previous studies explain the causes of homelessness but they did not explain the specific relationship between mental health and the employment of homeless. The objective of the study is to find the specific relationship between mental health and the employment of homeless. This study will try to determine if the severity of the mental illness will affect the ability to be employed. *Methods:* This study will use non-probability purposive sampling and a cross sectional design. Approximately 100 subjects will be interviewed from eight different agencies throughout Kansas. The interviews will be conducted from mid-March to the mid-April. To measure the main dependent variable we will utilize a survey question to measure the employment of homeless. To measure the independent variables we will use the CES-D scale for depression, the GAD-7 scale for anxiety, and the PTSD scale for PTSD. *Results:* Using the regression method, this study expects to find a significant relationship between the independent variable: depression, anxiety, and PTSD and the dependent variable: employment of the homeless. *Implications:* This study will provide the necessary information to the social workers, shelters, and concerned parties to provide the appropriate services for homeless people to be employed.

## Proposal to Include Infertility Information in the State of Kansas' Human Health and Sexuality Curricula

Amy Fowler

*Elliot School of Communication*

Although education on human health and sexuality is a compulsory part of Kansas public high school curricula, at least one component is missing: instruction on abnormal reproductive system processes. Some of the more common abnormalities of reproductive processes begin during the teenage years, or, in some cases, are present even earlier. Proper education in the major types and causes of infertility could allow students to seek treatment or resolution for such. When diagnosed early, some of the contributors to, and causes of, infertility can be mitigated or cured. Through a review of the existing relevant literature, the author's own data (generated from surveys), and interviews with those in the field, the author will defend her position that the Kansas public high school curricula for human health and sexuality should be expanded to include information about abnormal reproductive system processes. The specific information would include the three major types of dysfunction for males and females (each), and the symptoms, causes, treatments and/or cures for such. The finished product of this project will include a policy persuasive paper addressing the topic, a list of suggested curricular additions, and supplemental instructional media. It is the author's view that this type of information is important for the publicly-educated population, because, when left undiagnosed and untreated, reproductive system dysfunction negatively impacts an individual's ability to make appropriate family-planning decisions. Wider awareness of reproductive system dysfunctions could lead to an increased rate of diagnosis and appropriate treatment for such.

## Doubly Rebellious: Swashbuckling Women in the Golden Age of Piracy

Kate Page

*Department of History*

Women in history are often forgotten and overlooked. Often women who challenged social norms were romanticized and turned into fanciful stories making finding out who these women really are a challenge. This fact was especially true for female pirates. My paper, Doubly Rebellious, attempts to shed light on these fascinating women so often lost and forgotten. Women engaging in piracy are taking more chances than male pirates. Not only are they challenging the law but social norms as well. The significance of this paper is to shed light on a forgotten aspect of early Atlantic history. Also I am seeking to correct the assumption that piracy was strictly a male occupation and at the same time demonstrating gender roles in the 17th and early 18th century were far more fluid and dynamic than as previously presented. My methodology is a combination of an extended literature review and qualitative research. This includes both primary and secondary sources. References come from books, essays, articles, and newspapers. Through the study of Anne Bonny, Mary Read, and Grace O'Malley, my research has shown how extraordinary these women really are and how they gained the respect and discipline over men in a world that sought to control female independence and roles. In conclusion, my research hopes to present these female pirates as pioneers in women's independence and how they challenged social norms in both for the time period as well as for pirating standards.

# The Ineffectiveness of Habitual DUI Offender Laws in the State of Kansas

Adella Rucker

*School of Community Affairs*

This study will examine the current driving under the influence (DUI) policies in the state of Kansas. State government agencies have provided legislative oversight which challenges the effectiveness of these policies. They have deemed current policies ineffective in reducing the recidivism rate among habitual DUI offenders. Enacted DUI legislation was analyzed to determine the effectiveness of current laws and to measure whether these laws reduced the rate of recidivism. This study proposes that Kansas agencies are ineffective in enforcing DUI policies, specifically in mandating the usage of DUI devices. Results and implications will be further addressed.

# Comparing Statistical Models with Image Reproduction

David Stowell

*Department of Psychology*

Many statistical model comparison methods involve numerical statistics that are not easy to understand or interpret. Image reproduction can be used to make model comparison easier, providing a visual aide for comparing models. Step one of this procedure involves obtaining data from an image. Next, we use the data to estimate the models that we are comparing. Finally, we convert the model predictions into images that represent the models' abilities to predict the data. In the presentation, we will discuss image reproduction methods for model comparison and present an example involving regression and regression trees.

## Identifying Users' Characteristics Critical to Product Selection Using Rough Set Theory

Ali Ahmady

*Industrial and Manufacturing Engineering Department*

A consumer's purchase decision making process is very complex. It is obvious that the set of product functional features has a major role in the purchase decision. However, for a same product, users may have different assessments. So it seems that other factors than product functional characteristics play a role in decision making. Frequently, customers are segmented based on characteristics such as age, gender, geographic location, etc. Nevertheless, in many cases it has been seen that the customers in the same segment have different points-of-view for the same product. For example, some customers in a group may consider a product suitable while others don't. Inconsistencies between customers can cause uncertainty for designers in producing the most satisfying product attributes. This paper presents a method to resolve this kind of uncertainty using Rough Set Theory. The input of this method is users' evaluation data for a product with respect to a specific customer subjective feeling. The output is sets of the most influential users' characteristics on their product selection preferences. By using reduced sets of users' characteristics, designers are able to reclassify users and resolve inconsistencies.

## Shoulder Muscle EMG Activity During Push up on Varying Surfaces in Women

Christina Bair\*, Brandi Buckley, Rayanne Pralle, Melanie Schroeter, Barbara  
Smith, Michael Jorgensen<sup>1</sup>

*Physical Therapy Department, Industrial & Manufacturing Engineering<sup>1</sup>*

The unstable surfaces of a BOSU<sup>®</sup> ball and Swiss ball typically have a greater impact on EMG muscle activity during a push up compared to a normal push up done on a flat stable surface. This study's purpose was to determine if performing a push up with hands on a BOSU<sup>®</sup> ball and a push up with feet on an exercise bench influenced EMG muscle activity when compared to the activity of a push up on a stable surface in females. Eighteen females were recruited from a convenience sample of college students. Surface electromyograms were recorded from the biceps, triceps, rectus abdominus, external obliques, pectoralis major, latissimus dorsi, and posterior deltoid muscles while performing a push up with hands on a BOSU<sup>®</sup> ball, feet on an exercise bench, and a standard push up. The pectoralis major, rectus abdominus, and the external oblique muscles showed the greatest EMG muscle activity during certain phases of the 3 push up types. Although the posterior deltoids were activated by the 3 types of push ups, they showed low activity. Overall, the push up performed on the bench showed the greatest EMG muscle activity compared to the other types of push ups.

## Commitment Communication and Length of Marriage: The seven-year Communication Itch

Lisa Booth\*

*Elliott School of Communication*

Previous research indicates that marriage has been shown to be a relationship based in serious investment, which requires maintenance behaviors in order to remain satisfying. With this in mind I wanted to determine why the seven-year itch might exist. In the spring of 2008 I sampled 103 married couples from Wichita, KS and the surrounding area. They were selected through network sampling and asked to complete a survey regarding their marriage. The survey included the Self/partner behavioral indicators of commitment scale and Rusbult's commitment scale, which measured behavioral indicators and marriage satisfaction. I looked specifically at the perceived level of tangible reminders offered, the perceived level of creating a relationship together, the perceived integrity of the marriage and the overall satisfaction in the marriage. I hypothesized that as past research has shown, couples in the early years of marriage (0 to 6) will have high levels of behavioral indicators of commitment, followed by a drop in amount during the 7 to 23 year period, and a rise at the 24+ year mark.

The results of the survey indicated that my hypothesis was correct. Future research might determine if this curvilinear pattern (being low during mid level marriages) could account for divorce during these years.

## A Study of Teacher's Attitudes toward Implementation of a Comprehensive School Reform Model in Two Urban Schools

Kim Burkholter\*, J.K. Campbell\*, Bob Diepenbrock\*, Gina Marx\*

*Department of Educational Leadership*

In an effort to significantly improve student achievement and meet the mandates of No Child Left Behind, more and more public schools are turning toward externally developed comprehensive school reform (CSR) providers. CSR models provide a top-down direction for designing and supporting the process of school reform; tangible and accessible support for school change presumably steeped in research and literally packaged and delivered to the school site. Noting the difficulty of successful implementation and scale-up, this qualitative study offers a framework for assessing initial implementation of externally provided CSR models. Drawing on the existing literature regarding CSR implementation and scale-up, the field study team developed a framework that includes qualitative assessment of teacher attitudes toward program implementation from a variety of perspectives. This study provides an indicator of teacher attitudes during initial implementation and related literature review to help guide a school district's formative assessment of implementation of a specific CSR model

## Analysis of Differential Glycosylation Patterns of Human FSH

Carrie Chambers\*, Bin Shuai, George Bousfield

*Department of Biological Sciences*

Follicle stimulating hormone (FSH) is a glycoprotein hormone with two subunits,  $\alpha$  and  $\beta$ , and is required for gamete development. Our data suggest that estrogen is responsible for inhibiting the glycosylation of FSH $\beta$  in reproductive-age women, thus producing a di-glycosylated FSH with higher biological activity than the tetra-glycosylated form. The difference in glycosylation of two subunits is suspected to be due to activity of different oligosaccharyltransferase(OST) isoforms. OSTs are responsible for the first step in N-glycosylation. Factors including signal peptide hydrophobicity of  $\alpha$  and  $\beta$  maybe contribute to selective usage of OST, and hence modulate N-glycosylation. Therefore our hypothesis is that N-glycosylation of FSH subunits is regulated by the differential interactions between OST isoforms and the signal peptides of each subunit, and the differential interaction is modulated by hormones such as estrogen. To test our hypothesis, we will genetically engineer chimeric hFSH subunits by swapping the signal peptide sequences of  $\alpha$  and  $\beta$ . Constructs with the chimeric sequences will be introduced into immortalized gonadotrope cell lines. FSH glycoforms expressed in the cell lines will be examined using Western Blot. If our hypothesis is correct, then we would expect to detect unglycosylated  $\alpha$  subunit in the transfected cell lines. Different hormones such as estrogen will be used to treat the cell lines and the difference in FSH subunit glycosylation will be examined.

## How Inflationary are Oil Price Shocks? A Regional Analysis

Jon Christensson\*

*Department of Economics*

The impact of oil shocks is analyzed by estimating an augmented Phillips curve on a national, regional and city level in the United States. A significant pass-through to inflation (including all items) is recorded for all regions, while core inflation remains largely muted. The West region has experienced a much lower pass-through than other regions and a few reasons for this are; greater oil efficiency, lower inflation variability and a lower exchange rate pass-through in the West. Further, an increasing trend was noted for pass-through to inflation since the late 1980's, and the contrary was found for core inflation.

## Potential relationships between learning styles and memory strategies

Christina Coiner\* and Julie Scherz  
*Communication Sciences and Disorders*

Memory strategies are often taught by speech-language pathologists to individuals with memory impairments. Information about the relationship between memory strategies and individual differences could provide better direction for treatment approaches. This study explored the relationship between memory strategies and sensory modality strengths. Forty “typical” adults, ages 21 to 88, completed various memory tasks and sensory modality strength assessments. Assessments of memory included: letter and categorical fluency (*Test of Verbal Conceptualization and Fluency*), recall and recognition memory (*Rey Auditory and Verbal Learning Test*), immediate and delayed story retelling (*Arizona Battery for Communication Disorders of Dementia*), visual memory (*Detroit Tests of Learning Aptitude*). Upon completion of each memory task, participants were asked to report any strategies used to complete the task. There was no significant relationship between sensory modality strength and memory strategies used to complete the various memory tasks. Individuals use a variety of memory strategies unrelated to their sensory modality strength and the type of memory task. Speech-language pathologists should be aware of their clients’ individual differences and be prepared to teach an assortment of strategies to their clients with memory impairments.

## Bad for Business: Luther Against the Papacy

Alisa Cotter\*  
*Religious Studies*

This paper is an analysis of Martin Luther’s criticism of church practices including the papacy’s granting of indulgences, pilgrimage, the preservation and exploitation of relics, the cult of saints, and the belief in saintly intercession. Such practices, in his opinion, had become increasingly corrupt throughout the Middle Ages. I will examine how Luther’s critiques of these practices were expressed in the religious propaganda that circulated during this period by looking at the interplay between image and text found in the polemical pamphlet, the *Passional Christi und Antichristi*, which was jointly produced by Martin Luther and the artist Lucas Cranach the Elder in 1521. The *Passional* presents thirteen pairs of contrasting images which comment upon events in the life of Christ and compare them to the perceived abuses of the papacy. These visual dialogues illustrate the extent and nature of the opposition to the papacy during the Protestant Reformation.

## Risk Factors and Interventions with Sexually Exploited HRTY

Karen Countryman-Roswurm\* and Brien Bolin

*School of Social Work in Conjunction with Center for Community Support and Research*

This evaluative study sought to answer the questions: “What are the precursors and/or risk factors that make certain youth more likely to become involved in domestic teen sexual exploitation (TSE)? And, if such high risk youth receive a cognitive-behavioral/psycho-educational peer group intervention, will their vulnerability decrease due to an increase in protective factors? This study reports findings of a group design in which a pre-test/post-test was given to 23 Homeless, Runaway, and Throwaway Youth (HRTY) who attended 10 sessions of a psycho-educational therapy group. Associations between risk factors and vulnerability to sexual exploitation and/or relationship violence, improvements in measures (including knowledge about healthy relationships, leaving an abusive relationship, reported improvement in relationships, etc. as well as with the Rosenberg Self-Esteem Scale) are reported. This study supports the use of psycho-educational peer group therapy in building protective factors, thus increasing resiliency.

## Speech-Language Pathologists’ Self-Assessment of Knowledge Regarding Medications to Treat Behaviors Associated with Autism Spectrum Disorder

Daiquirie Crumrine\*<sup>1</sup>, Trisha Self<sup>1</sup> and LaDonna S. Hale<sup>2</sup>

*<sup>1</sup>Department of Communication Sciences and Disorders and <sup>2</sup>Department of Physician Assistant*

Children with Autism Spectrum Disorder (ASD) are often prescribed medications to help control self-injurious behaviors, aggression, compulsive behaviors, and hyperactivity. Speech-Language Pathologists (SLPs) should be familiar with medication-related behavior changes and side effects. The purpose of this study was to evaluate SLPs’ self-assessment of knowledge regarding medications prescribed to children with ASD. SLPs registered with the Kansas Speech-Language Hearing Association were provided a link to an online survey. The response rate was 13%, (n = 56). Overall, 88% of respondents felt they had a good understanding of ASD characteristics; but only 15% felt they had a good understanding of ASD medications. Only 14% were satisfied with their medication knowledge, 79% wanted to be more knowledgeable, and 60% felt they knew where to locate medication information. SLPs that completed continuing education were more likely to be satisfied with their knowledge regarding ASD characteristics than with ASD medications.

## Statistical Presentation of the Flight Environment of the Propellers on Commuter Aircraft

Johann Dorfling\*, Linda K. Kliment and Kamran Rokhsaz  
*Department of Aerospace Engineering*

Data obtained from digital flight data recorders installed on a fleet of 27 Beech 1900D airliners are used to assess the actual operational environment of propellers on commuter aircraft. The data consists of 910 complete flights and 589 flight hours. The short duration takeoff rotation is identified as the most severe phase of operation with regard to vibratory loads on the propeller blades resulting from a tilted inflow angle. Also, normal accelerations data, which reflect the turbulence experienced in flight, is converted to the resulting change in the propeller inflow angle. Increasing altitude shows a significant reduction in the frequency and magnitude of the inflow angle variation caused by gusts. The information is presented in statistical formats that could enable the FAA, manufacturers and operators to better understand and control those factors that influence the structural integrity of these components.

## Parental Involvement in a Rural Consolidated School District

Natalie Grant\*, Kathleen Patterson\*, Lance Stout\* and Robin Surland\*  
*Department of Educational Leadership*

The rural consolidated school district of Ingleside in South Central Kansas faces unique challenges in managing communication and providing opportunities for parental involvement and shared decision making. The lack of attachment to the school district was a deterrent for families as they held on to the identity of their home community. As students transition from the five elementary or K-8 schools in their diverse communities, into one consolidated high school, there have been unaddressed and emerging needs. The research team studied how the Ingleside District could better understand the needs and perceptions of parents and students as related to their involvement and to the overall decision-making processes. The researchers found that the Ingleside District has challenges in truly helping parents, teachers, and students join together as a unified consolidated school district. These challenges include developing transparent mechanisms and processes for engaging and inviting parents to participate. Through a new sense of unity, the school district and the community can create the capacity to face hard decisions still ahead of them.

## Crack Arrest Capabilities in Adhesively Bonded Skin and Stiffener

Shamsuzuha Habib\* and K.S. Raju  
*Department of Aerospace Engineering*

The crack arrest capabilities and the load bearing characteristic of a stiffened and unstiffened panel subjected to uniform remote displacement field is examined in this paper. A four stringer stiffened wide panel is analyzed for a center crack, propagating towards the adjacent stringers. The linear elastic analyses indicated a decrease in stress intensity factor when the crack approaches the stiffener. The non-linear analysis with crack across the skin-stringer assembly indicated a reduction in strength relative to an unstiffened panel.

## Multivariate Isotonic Regression and its Algorithms

Linda Hoffmann\* and Xiaomi Hu  
*Department of Mathematics & Statistics*

We use regression functions, which are the means of random variables, to interpret statistical inferences and model the world around us. Often an order is imposed on the values of the regression function. Thus, we refer to the regression as an order restricted regression or an isotonic regression. In this paper we explain how to calculate multivariate isotonic regression. We investigate the case for a particular restriction on our elements by imposing relations between elements of the same row but not between rows. Thus, our data matrix is isotonic and the collection of all of them gives us a convex cone. These matrices have several interesting characteristics. The most important one is the opportunity to decompose our multivariate model into univariate models. This allows us to use prior knowledge about the simpler case to solve the multivariate model. Besides understanding the data matrix, we need to find the estimates to the parameters given in the model so that we can create population models for future references. The unrestricted estimator to a parameter in a normal model, with which we are dealing, is given by the Maximum Likelihood Estimator (MLE). The restricted MLE is then the projection onto our space from which the restriction comes. Finally, we propose an algorithm to calculate the multivariate isotonic regression. This algorithm could then be converted into a computer program.

## Dielectric Properties of MWCNTs Reinforced Polyacrylonitrile (PAN) Nanofibers at Varying Temperatures

Khan, Waseem, Ceylan, M. and Asmatulu, R  
*Mechanical Engineering Department*

Electrospinning is one of the easiest and straightforward processes of fabricating nanofibers. In this study, MWCNTs in the range of 0% to 15% were added into polymeric solution containing PAN and dimethylformamide, and studied the morphology and dielectric properties of electrospun nanocomposite fibers at elevated temperature. Dielectric properties were measured in the temperature range between 23 and 90 °C and found that the dielectric constant increased with increasing the carbon nanotubes content. This may be because of the conductivity and polarization effects of the nanocomposite fibers.

## Assessing the Career Aspirations, Family Structure and Ability to Succeed Among African-American Males

Felecia Lee\* and Rhonda Lewis-Moss  
*Psychology Department*

African-American males experience poor academic performance, high absenteeism at school and are at increased risk of being involved in violence than other racial groups. These negative outcomes may be, in part, a result of lacking a positive male role model within the family and community. The Real Men, Real Heroes program was designed to expose African American youth to positive male role models in the community. African-American males in schools were surveyed. Schools with a high percentage of African American males were selected so their input could be included in the study. The purpose of the survey was to compare the career aspirations, family structure, and ability to succeed of African American males to other ethnic groups. Ranging from ages 8 to 15, 473 males were surveyed at the baseline and 491 surveyed at the follow-up. The results revealed that African-Americans were more likely to aspire to be athletes than other ethnic groups before and after the intervention. The results also revealed that 35% of African American males reported living with their fathers compared to 68% of other ethnic groups. African American males continued to aspire to attend college before and after the intervention. The follow-up revealed that young men stated that they had more people to look up to and the amount of exposure to the program affected whether the heroes influenced their goals.

## Postmodern Places

Jodi Lightner\*

*School of Art and Design*

Art is able to communicate and transport viewers to a different location in their mind's eye. The representation of places also connects the artist and viewer in a shared experience and understanding of space. The challenge for postmodern painters is to understand how an experienced place can be represented effectively. They must consider the objects and structures that occupy the place, as well as the purpose for the environment, the experience, and how that experience relates to self and others. With many contemporary artists utilizing installation and three-dimensional works to dialog about place, two-dimensional artists must consider stepping away from traditional formats and contrive alternative ways to represent place. Examination of contemporary two-dimensional works has shown the popularity of four distinct elements used in art that address place. These elements are: linearity and mark making, process, associations, and altered perspective and representation.

## A Districts' Perceptions: Necessary Skills in the 21<sup>st</sup> Century

Lisa Lutz\*, Larry Callis\*, Dale Herl\* and Mark Watkins\*

*Educational Leadership*

Secondary students are graduating into a world that is increasingly interconnected, interdependent and culturally diverse. This dynamic environment requires a level of intercultural and information literacy that is presently recognized by some school district leaders and teachers in a mid-western suburban school district as a necessity for its graduates. This study focused on district stakeholder perceptions of the current intercultural and information literacy of graduates, stakeholder perceptions of what is needed for future graduates, and stakeholder perceptions of the requirements for instituting curricular changes to prepare its students for the 21<sup>st</sup> century. A qualitative methodology comprised of focus groups, interviews, and an online survey of key stakeholders and document review were conducted. Critical social, social exchange and constructivist learning theories underpinned a constructionist epistemology informed this methodology. The results served as an aid in providing awareness and direction to the school district in curricular and instructional decision making.

## Detection and Quantification of Ketamine HCl in alcoholic Drinks using Mass Spectrometry and Liquid Chromatography

Justin Lygrisse\*, Martin Lapp, Kelsey Witherspoon, and Michael Van Stipdonk

*Department of Chemistry*

Drug facilitated date rape continues to be a problem around the world. Ketamine HCl (KT) has gained popularity since it is nearly odorless, tasteless, and colorless when dissolved in water/alcohol and a typical street dose (300-400mg) only costs \$20-\$25. A street dose of KT will send the victim into a dissociative state within 10-15 minutes and can cause temporary amnesia. Drug detection is paramount in the prosecution of drug facilitated date rape cases. Currently, detection of KT relies on urine or blood analysis. In this study we have developed a method for detecting and quantifying KT in a variety of different alcohols and mixed drinks. Mass spectrometry (MS) was used to identify the presence of KT in the alcohol matrices. Liquid chromatography (LC) was used to separate the KT from the rest of the alcohol matrix. Quantification of KT was carried out both by MS and LC/UV absorbance using a series of external standards and plotting the concentration versus the signal intensity. Interestingly, it is possible to distinguish not only between different types of alcohol but also different brands of similar alcohol. KT was clearly visible in the spectrum of KT spiked drinks and did not show any interference from the alcohol matrix. Detection limits were found to be in the 100 piconM range and samples were stable for up to 7 days. This method has proven to be robust and a viable way to quantify KT in alcoholic beverages for up to 1 week with very low limits of detection.

## A Survey of Pharmacist Participation in Trauma Resuscitation

Emily J. McDonald\*, Lahna R. Elliott \* and LaDonna Hale

*Department of Physician Assistant*

Pharmacists are increasingly being used on hospital medical response teams. An estimated one in five US level I and II trauma centers offer pharmacy services during trauma resuscitation, however, these clinical pharmacy services are not well described in the literature. *Purpose:* To gain insight into the roles and responsibilities of pharmacists participating in trauma resuscitation and the characteristics and implementation of this pharmacy service. *Methods:* A previous national survey of trauma directors identified 57 facilities that use pharmacists during trauma resuscitation. A 49-item paper survey was mailed to the pharmacy department at each facility. An online survey was offered to all initial non-responders. Contact was achieved with 27 (47%) facilities; six were excluded stating they did not attend trauma resuscitation; 21 surveys were analyzed. *Results:* Characteristics of the trauma services including hours of operation, workflow, pharmacist training, and roles/responsibilities are discussed. Over 85% stated they usually or always perform the following: prepare medications, ensure IV compatibility, calculate and correct dosages, and provide drug information. Perceived advantages of trauma pharmacy services include the pharmacists' pharmaceutical expertise, freeing nursing time, and improved patient safety and outcomes. Barriers and obstacles to implementation are also discussed. *Conclusion:* The results of this survey provide detailed descriptive data regarding pharmacist participation in trauma resuscitation. This information may serve as a resource for trauma centers considering expansion of pharmacy services into the trauma setting

## Depositional and Structural History of the Sedgwick Basin, South Central Kansas in Relation to Petroleum Entrapment

Jessica A. Puyear\* and S.J. Mazzullo

*Department of Geology*

The Sedgwick Basin is an important hydrocarbon-producing area in Kansas. Subsurface structural and isopach (thickness) maps and cross-sections illustrate the depositional and tectonic history of the area. It has undergone several episodes of compression followed by tensional deformation during the Paleozoic, which formed anticlinal and fault-bounded structures that were conducive to hydrocarbon accumulation. Also, there were several episodes of sea-level fall and attending subaerial exposure that produced unconformities and reservoir porosity. Approximately 110 million barrels of oil and 118 MCF of natural gas have been produced over the last 92 years in the area. The structural and stratigraphic mechanisms important in hydrocarbon entrapment and future potential in this area are assessed.

## Bayesian Approach to Detect a Shift in Process Average

Nasser Safaie

*Department of industrial and Manufacturing Engineering*

This research is an effort to introduce the Bayesian chart as a tool for evaluating process adjustments aimed at causing a shift to the process average. This is usually encountered in scenarios where the process is found to be centered away from the design target. Typically, a numbers of changes are proposed and tested as part of the improvement efforts. As such, it is desired to evaluate the effect of these changes as soon as possible and take appropriate actions. Using simulated data, the performance of the Bayesian chart is compared with that of the Shewhart type control chart. The results indicate process models where the Bayesian charts outperform the Shewhart charts.

## Recursive Frame Analysis of Physician-Patient Interactions: A Pilot Study

Phillip R. Sechtem\*

*Communication Sciences and Disorders*

Medically based interactions can be complicated and overwhelming. Reliable identification of breakdowns and reasons why they occur is essential. In his seminal work, *Frame analysis: an essay on the organization of experience*, Erving Goffman (1974) described sociolinguistic constructs designed to systematically analyze the complexities of human interactions. Initially, the focus of this study consisted of using frame analysis (FA) toward analyzing physician-patient interactions. Results were mixed. While the use of FA was possible, it was extremely difficult to apply it reliably across interactions and between judges. The focus then turned to recursive frame analysis (Chenail, 1995). A spin-off of Goffman's work, recursive frame analysis (RFA) constructs are more narrowly defined and more adaptable to the novel characteristics of interactions. Because of this, it was felt that RFA would be more useful in analyzing physician-patient interactions. The goals of this study are now to employ RFA towards actual video recorded physician-patient interactions, to determine the level of interjudge reliability between researchers of RFA, and to determine the level of correlation between various RFA constructs and patient satisfaction and recall. Additionally, there is interest in determining possible patterns of frequencies and causes of communicative breakdowns.

## Testing a Global Screening Method to Probe the Role of Epigenetics in an Experimental Model of Estrogen-Dependent Uterine Cancer

Megan Simpson\* and William Hendry

*Biological Sciences*

Diethylstilbestrol (DES), a synthetic estrogen, was widely administered to pregnant women between 1947 and 1971 on account of a misconception that it could prevent miscarriages. The offspring of these women were diagnosed with various reproductive tract abnormalities, including cancer. We focused this study on DES-induced abnormalities in the uterus. More specifically, we screened for altered DNA methylation patterns. DNA methylation is a major component of the currently high-profile topic of epigenetics. Epigenetic modifications are now viewed as just as important to the development of cancer as are DNA mutations. We use Syrian golden hamsters to study the consequences of early developmental DES exposure. This study used Methylation Sensitive Restriction Fingerprinting (MSRF) to screen for altered DNA methylation patterns in uteri from control vs. neonatally DES-treated hamsters. Preliminary results show differential DNA methylation patterns in uteri of control and DES-treated hamsters. Further studies will be done to determine sequence of differentially methylated bands of interest.

## Data Caching in Ad Hoc Networks using Bloom Filters

Julinda Taylor

*Department of Electrical Engineering and Computer Science*

Data caching provides efficient data access by maintaining replicas of data in strategic parts of the network. However, current research in this area does not manage memory space of each node efficiently. We propose an improvement by considering Bloom filters, a fast, space-efficient probabilistic method for looking up data. We compare the system the system performance with and without Bloom filters and show the performance is very close, even though the Bloom filter only takes half the space of the nearest cache table.

## The Study of The Effect of Long Term Water Cover on the Mill Tailings of the Silver Lake Mill # 1, Near Silverton, Colorado.

Renee Vardy\*

*Geology Department*

Mining and milling of metals were the primary industries in the study area during the late 1800's into the early 1900's. Wastes from the mining and milling processes are abundant in the area and present a significant environmental threat. Abandoned in 1900, the Silver Lake Mill # 1 is located on Silver Lake, southeast of Silverton, CO. Tailings (mill wastes) are located above and below the lake level providing an excellent location to study long term water cover of mill tailings. The project included water samples from the lake, its outlet and inlets plus tailings samples above and below water. These samples were used to determine if the lake is contaminated and if so, the pollution source. Field parameters of pH, conductivity, temperature, and dissolved oxygen were observed. Samples were analyzed for Al, Fe, Cu, Ni, Zn, Cd, and Pb. All parameters except Ni were found in the lake, but the inlets, which had low concentrations, cannot entirely account for this. Examination of results show the lake holds contaminated water with increasing metal concentrations with depth. It also reveals the source of contamination is primarily transfer from submerged tailings. Lastly, it shows that the contamination is generally contained within the lake.

## Sexual Dimorphism of the Iliac Crest: A Quantitative Approach

Joy H. Vetter\* and Peer H. Moore-Jansen

*Department of Anthropology*

This study examines indicators of male-female differences in the os Coxa, specifically in the shape of the iliac crest for the purpose of skeletal sex estimation. The iliac crest is a curved, or “S-shaped”, epiphysis which extends along the cranial margin of the ilium, posteriorly from the anterior superior iliac spine to the posterior superior iliac spine of the os Coxae. Forty metric variables characterizing the shape of the os Coxa and iliac crest are derived from a digital data-base of 150 adult White human os Coxae, including 75 males and 75 females, from the Hamann-Todd osteological collection at the Cleveland Museum of Natural History. The os Coxae are all digitized using a MicroScribe-3DX digitizer, and the data is stored in an excel spread-sheet, facilitating further mathematical analysis to define and calculate all variables. A single point of origin defined as the most superior point in the midline of the pubic symphysis, is common to each variable. This study hypothesizes that these variables will better define variation in form, and that they will better characterize sexual dimorphism in the iliac crest. Thus serve as an aid in sex identification. Statistical analyses will be used to test the potential application of the findings of this study to human identification in osteological investigation.

## Dynamics of Gender Ideology of Hamas

Kristen Waymire\*

*Women's Studies*

In The West has often approached Hamas within an Orientalist perspective. As Said established in his seminal work, Orientalism is a form of discourse that is based on and maintained by the distinction made between “the Orient” or “the Other” and “the Occident” (Said 1979: 2). It is seen as monolithic and static. However, careful analysis reveals that the movement is flexible and fluid. Hamas actually provides its own discourse that offers an ever-changing framework of identity formation. By one merely labeling the group as a “terrorist” organization, the potential for comprehensive analysis is not only undermined but is reduced to focusing on the group’s actions and doctrinal aspects of its charter. Although some scholars have begun serious in-depth studies and research into the Islamic Resistance Movement as a dynamic group within a broader context of socio-economic and cultural factors influenced and generated by the Nakba and subsequent Israeli occupation, the gender ideology of Hamas as well as other Islamic movements has been greatly ignored. As Islah Jad, a Palestinian scholar who is an associate professor at Bir Zeit University in the West Bank as well as one of the founders of the Women Studies Institute at the university, states in her article entitled “Between Religion and Secularism: Islamist Women of Hamas” that not only has the gender ideology of Islamic movements been sketchy but that also the women militants and their role(s) have been neglected in the study of Islamic movements (Jad 2005:172.)

## Old Town to New: the Other Side of Wichita

Cheryl Adams and Judith Johnson

*Elliott School of Communication*

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

## Influence of Informational Video Elements on Breast Cancer Treatment Decisions

Amanda Barr and Robert Bales

*Department of Psychology*

This research seeks to determine how medical treatment decisions differ when informed by decision aid videos providing 1) only statistical information or 2) statistical information supplemented by former patients' testimonials. Female participants will be recruited via an ad placed in the Wichita Eagle and contact with local community groups. After completing an online screening measure, selected participants will report to the Decision Making Research Lab at Wichita State University for a two-hour study. Participants will be asked to imagine that they have been diagnosed with early stage breast cancer and need to make a treatment choice between lumpectomy with radiation or mastectomy. To aid in their decision making process, participants will be shown one of two videos describing these two treatment options. One video provides only statistical information, while the other provides both statistical information and testimonials from women who have been previously diagnosed with early stage breast cancer. After viewing the video, participants will be asked to make a treatment choice, describe their decision making process, and answer a number of questions about the video. It is predicted that the two groups (women who have watched the video with only statistical information and women who have watched the video with both statistical information and testimonials) will differ with respect to their treatment choices, reports of their decision making processes, and reactions to the video. Results from data collected in March and April will be presented.

## Synthesis of Ferrofluids at Controlled Ph

Bailey Cooper, Janani Sri Gopu and Ramazan Asmatulu  
*Department of Mechanical Engineering*

Most of the ferrofluids are produced at extreme high or low pH values in order to prevent agglomeration of the nanoparticles mostly caused by van der Waals, electrostatic and magnetic forces, which limits the application of ferrofluids for various fields. In the present study, magnetite ( $\text{Fe}_3\text{O}_4$ ) nanoparticles (~10 nm) were produced by co precipitation of iron (II) and iron (III) chloride salts in the presence of ammonium hydroxide, and stabilized using first citric acid at 85°C, and then tetramethylammonium hydroxide (TMAH) and sodium dodecyl sulfate (SDS) at room temperature. Measured pH values of the ferrofluids were between 7.0 and 8.0. This experimental study prove that the double coating of magnetite nanoparticles by citric acid and TMAH/SDS give strong spiking ferrofluids. It is assumed that these ferrofluids can be utilized for the biomedical applications due to the strong ferromagnetic behavior, less sensitivity to oxidation and relatively low toxicity compared to many other ferrofluids made of other magnetic materials (e.g., iron, nickel and cobalt).

## Exploring Fragmentation of Gas-Phase Peptide Ions

Stephanie Curtice  
*Department of Chemistry*

Tandem mass spectrometry and fragmentation caused by collision-induced dissociation (CID) of gas-phase ions are the principle tools used to identify peptides and proteins in proteome studies. Despite numerous general studies of peptide dissociation in the gas-phase, we still lack a detailed view of how fragmentation occurs and how specific amino acid residues affect reaction energies and rates. To contribute to our understanding of fragmentation mechanisms, we investigated the tendency for model tripeptides to form sequence ions using energy and time-resolved CID experiments, and density functional theory (DFT) calculations to explore structures of, and energies for, reaction intermediates, post-reaction complexes and transition states. We used model tripeptides alanine-glycine-glycine, alanine-alanine-alanine, alanine-valine-glycine and alanine-leucine-glycine, in order to determine the effect changing the identity of the middle amino acid on the energetics of fragmentation reactions. Experiments show clearly that the collision energy required to produce sequence ions depends on peptide sequence, as the barrier to dissociation decreased, in general, with increasing size of the middle amino acid. Comprehensive DFT calculations of reaction potential energy surface support the experimental measurements: transition state energies decrease systematically with increasing size of the middle amino acid. In addition bond angle and length data suggests that the effects observed are guided largely by alteration of shape and orientation with pre-reaction conformation and transition states.

## Limited Life by Abuser Control

Emmeline Eushatche, Kalisha Fisher and Rebecca Hall  
*School of Social Work*

In today's economic downturn finding employment has become difficult for many in the best of circumstances. However, domestic violence victims face a set of barriers unique to their individual situation that other homeless victims looking for employment do not have. The purpose of this study is to show how domestic violence influences the employment of its homeless victims. Disabling conditions that are unique to domestic violence victims need to be brought to the attention of social workers and politicians to provide the proper resources that will help eliminate these barriers. *Methods:* Purposive, Non-probability sampling of approximately 100 individuals from area shelters consented to take part in this cross-sectional survey given by researchers in private settings at area shelters. Survey period was from middle of March to middle of April. Eight agencies in Kansas were surveyed. The Independent variable, domestic violence, was measured by using University of Michigan's domestic violence scale. The main dependent variable, employment is measured by a survey question. *Results:* This study expects to find a significant relationship between domestic violence and the employment of homeless people using multiple regression method. *Conclusion:* These findings show a significant need for long-term mental health services as being paramount for victims of domestic violence.

## Synthesizing Drug-Carrying Nanocomposite Sphere for Targeted Drug Delivery

Janani Sri Gopu, Bailey Cooper and Ramazan Asmatulu  
*Department of Mechanical Engineering*

Magnetic targeting is a promising method for drug localization. Controlled delivery occurs when a drug is associated with a biodegradable polymer and magnetic nanoparticles, so the drug molecules are continuously released from the nanocomposite structure to the area of interest. In this study, drug-carrying magnetic nanocomposite spheres were synthesized using magnetite nanoparticles and poly (D,L-lactide-co-glycolide) (PLGA) for the purpose of magnetic targeted drug delivery. Magnetic nanoparticles (~13 nm on average) of magnetite were prepared by a chemical co-precipitation of ferric and ferrous chloride salts in the presence of a strong basic solution (ammonium hydroxide). An oil-in-oil emulsion/solvent evaporation technique was conducted at 7000 rpm and 1.5-2 hrs agitation for the synthesis of nanocomposite spheres. Specifically, PLGA and drug were first dissolved in acetonitrile (oily phase I) and combined with magnetic nanoparticles, then added drop-wise into viscous paraffin oil combined with Span 80 (oily phase II). Nanocomposite spheres with different contents of magnetite (0%, 10%, 20%, and 25%) were evaluated in terms of particle size, morphology and magnetic properties by using dynamic laser light scattering (DLS), scanning electron microscopy (SEM), transmission electron microscopy (TEM) and a superconducting quantum interference device (SQUID). The results indicate that nanocomposite spheres (200 nm to 1.1 micrometer in diameter) are superparamagnetic above the blocking temperature near 40 K and their magnetization saturates above 5,000 Oe at room temperature.

## Electrocatalytic Reduction of Oxygen by Water Soluble Cobalt Porphyrin

Dona Liyanage, N. K. Subbaiyan, E. Maligaspe and F. D'Souza\*

*Department of Chemistry*

Electrocatalytic reduction of molecular oxygen to water is important due to its prominent role in energy technology related to fuel cells. The need to find alternatives to platinum, an expensive catalyst currently used in hydrogen/oxygen and alcohol/oxygen fuel cells, has made electrocatalytic reduction of oxygen using molecular catalysts a hot research topic throughout the world. Many transition-metal complexes have been investigated for their catalytic ability towards oxygen reduction but cobalt macrocycles have shown the most promise. Cobalt porphyrins are capable of reducing molecular oxygen to hydrogen peroxide, a two-electron/two-proton process or the desired four electron/ four-proton process to water depending upon the nature of the complex, solution conditions and electrode material. Here, we report a novel class of water soluble cobalt porphyrin, cobalt meso-tetrakis (N-methylimidazoliumphenyl)porphyrin, that can be used effectively to modify electrode surfaces. The phenyl ring between the imidazolium and porphyrin macrocycle helps in increasing the linearity thus making it more suitable for four-electron reduction by better surface adsorption. Cyclic voltammetry and rotating ring disc voltammetric studies reveal that the glassy carbon (graphite) electrodes modified with the new cobalt porphyrin binds dioxygen and catalytically reduce by either a two- or four-electron catalytic process depending upon the solution conditions.

## Linking Seed Leachate with Negative-Density Dependent Germination in Sericea

\*Mahoney, A. K. and G. R. Houseman

*Department of Biological Sciences*

A recent seed sowing experiment in native grassland revealed negative-density dependent germination in sericea (*Lespedeza cuneata*). Preliminary laboratory studies suggested that this pattern may be related to compounds released from sericea seeds. We tested under laboratory conditions whether: 1) seed germination is negatively affected by seed densities of conspecifics, and 2) whether reductions in germination are linked to seed leachate. Sericea seeds were sown onto sieved, field soil in flats under artificial light at Low (40 seeds/307 cm<sup>2</sup>) and High (400 seeds/307cm<sup>2</sup>) density. Seed leachate was prepared by soaking 12.5g of sericea seed- equivalent to the high seed density treatment- in water and then applying this solution to the leachate treatments. After 21-days, the germination percentage decreased from 18% at Low density to 11% at High density. In the presence of seed leachate, the germination percentage of the Low density treatment was reduced to same levels as the High density treatment without leachate. These results suggest that seed leachate has a negative effect on the germination of conspecific neighbor seeds, and may be responsible for observed negative-dependent germination under field conditions.

## Spirituality/Religiousness and the General Well-Being of Older Adults

Susan P. McCoy and Kyoung Hag Lee

*School of Social Work*

Spirituality is an important resource for older adults in terms of an intra-psychoic means of coping and adaptation with issues of daily life, loss, and death. However, little is known about impact of spirituality/religiousness on the general well-being of older adults. The purpose of this study is to examine the impact of spirituality/religiousness on the general well-being of older adults in seven central states. This study is important for social workers to increase their assessment and intervention skills utilizing religiousness/spirituality to minimize the health problems of older adults. Methods: This cross-sectional study was conducted through a convenience sampling method for 143 older adults 65 year-old or over from 15 counties in seven central states. To measure various domains of health status, the General Well-Being Schedule (GWBS) was used. To measure spirituality/religiousness, the Brief Multidimensional Measures of Religiousness/Spirituality (BMMRS) was used. Results: The respondents ranged in age from 65 to 97. The other characteristics showed female (55.2%); Caucasian (63.4%); married (47.9%). Regression results showed that higher spiritual experience is significantly associated with lower anxiety ( $B = -.37, \leq .01$ ), greater positive well-being ( $B = .46, \leq .01$ ), and greater vitality ( $B = .36, p \leq .05$ ). Religious support is a negative factor in the positive well-being of older adults ( $B = -.24, p \leq .05$ ). Implications: Social work practitioners should assess the religious background of clients, family, community, and nation and level of concerns in use of spiritual resources. However, the religious/spiritual intervention of social work practitioners should be offered as a type of therapeutic options because some clients do not like religious/spiritual activities and some religious/spiritual intervention can cause negative results to clients.

## Mixed Nitrogen Sulfur Donation to Nickel(II) Centers Models for the Active Site

Alexandra Meloccaro

*Department of Chemistry*

Carbon-monoxide Dehydrogenase/Acetyl coenzyme A synthase (CODH/ACS) is an interesting bifunctional enzyme. It catalyzes the reversible reaction of carbon dioxide to carbon monoxide and the assembly of acetyl coenzyme A. CODH/ACS is one of six known enzymes in nature with Nickel in the active site. The A-cluster active site (Figure 1), which catalyzes the assembly of ACS, contains a dinuclear Nickel complex bridged by two thiolate ligands. The proximal Nickel, Nip, has  $S_3X$  coordination while the distal Nickel, Nid, has  $N_2S_2$  coordination. Our project focuses on making synthetic compounds with similar coordination geometry to the Nickels (Figure 2). In previous research, Dr. Eichhorn's group has developed an efficient method for synthesizing metal complexes with mixed N/S coordination through the use of 2-2'-dithiodibenzaldehyde, DTDB. Symmetric dimers have been synthesized with coordination similar to that around Nip, using DTDB. Our attempt is to create asymmetric dimers with coordination modeling both Nip and Nid. The analytical technique for determining the structure is X-ray diffraction crystallography. Herein I will report the methods and findings of the research that I have completed.

## Control of Binding Modes of Cationic Water Soluble Porphyrin Interactions W/ Dna

Firdauze Mohtar, Eranda Maligaspe and Francis D'Souza\*  
*Department of Chemistry*

The binding and interaction of water soluble porphyrins to nucleic acids have undergone rapid growth in recent years mainly for their wide range of applications including telomerase inhibition, DNA binding and cleavage, photodynamic therapy of cancer, chirality sensing, and as MRI agents. The interaction of porphyrins with DNA can occur through three types of binding modes, namely, intercalation, outside binding in the groove, and outside binding with self-stacking along the DNA surface. Here, we designed a new class of water soluble porphyrin, meso-tetrakis (N- methylimidazolium) porphyrin and report its interaction and binding to DNA. The present studies, probed by optical and emission, circular dichroism and gel electrophoresis techniques, demonstrate that the mode of porphyrin binding to DNA depends on the metal ion in the central cavity of porphyrin, nature of the substituents on the ring periphery and solution conditions. Structure-binding aspects of porphyrin-DNA will be discussed.

## Substance Abuse and the Length of Homelessness (Or Recidivism of Shelter Use)

KimNgoc Nguyen, Amanda Androes and Shea Krehbiel  
*School of Social Work*

Homelessness is a condition that has been observed to effect individuals within a population who have deviant behavior and lifestyles or have difficulty adapting culturally. Substance abuse has been a reoccurring issue in the United States throughout history. The prevalence of substance abuse and specifically, its relationship with the homeless population has raised many concerns regarding policy and programs, and how to provide better support and care for individuals suffering from both substance abuse and homelessness. This study was designed to measure how substance abuse affects homelessness. *Methods:* One hundred homeless persons, residing in over 8 homeless shelters or agencies in the state of Kansas, completed a cross-sectional survey during the time period of mid-March to mid-April 2009. DAST-10 and SMAST 13 scales were used to measure drug and alcohol abuse per each participant and survey questions were used to categorize demographics and lengths of homelessness of each participant. *Results:* Expected results will show the higher the level of substance abuse, the longer the length of homelessness. *Implications:* This study of the relationship between substance abuse or the recidivism of homelessness will allow for a better understanding of the preventions and programs that are in need to positively affect both social issues.

## Catechol Appended Fullerene as a Building Block for Supramolecular Donor-Acceptors

Eric O. Oweggi, Aravinda Wijesinghe and Francis D'Souza\*

*Department of Chemistry*

Self-assembly is an amazingly powerful concept in modern chemistry. The ability of relatively simple molecules to spontaneously assemble into discrete nanostructures offers unlimited possibilities for fundamental discoveries and practical applications. Furthermore, the self-assembly of carefully designed building blocks can exhibit novel properties. In particular, this concept has been employed to produce sophisticated supramolecular devices. Hence, there is a growing demand for functionalized with self-assembly components of redox- and photo-active molecules. In the present study, we report the synthesis of a fullerene functionalized with a catechol entity. Further, the capability of the catechol entity to form redox-active complexes with metal ions, to form donor-acceptor hybrids suitable for studies involving electron transfer reactions, has been tested out. The target compound is synthesized by heating under reflux a mixture of the C<sub>60</sub> fullerene, 3,4-dihydroxybenzaldehyde and sarcosine (in a ratio of 1:5:3 respectively) in toluene for 10 hours. The product was isolated by boiling off the solvent, then running a column first with toluene to elute unreacted C<sub>60</sub>, and finally with chloroform to elute the final product. Upon spectral characterization of the fullerene (C<sub>60</sub>)-catechol derivative, it is selected to coordinatively bind Zn<sup>2+</sup> and Mg<sup>2+</sup> metal ions (see Scheme below). It is expected that a higher energy state can be achieved in the fullerene-Zn and fullerene-Mg complexes enabling photoinduced electron transfer in the newly formed hybrids. This hypothesis is currently being tested out in our laboratory.

## CS1 Pilus Chaperone Protein CooB Characterization

Sean Michael Ritterhouse and James G. Bann

*Department of Chemistry*

CS1 pili are found in Enterotoxigenic Escherichia coli. These pili attach to the intestines, allowing the bacteria to reside there, leading to diarrhea and other health problems. The CS1 pilus assembly system consists of only four subunits (A, B, C, and D). Subunit B or CooB is a chaperone for the system and is required for proper folding of the other protein subunits and is the focus of this investigation. The interactions of CooB with a lipid membrane were monitored by fluorescence. The fluorescence experiments included tryptophan fluorescence, acrylamide quenching, quantum yield, and Fluorescence Resonance Energy Transfer (FRET). The fluorescence studies suggest that CooB does interact with the lipid membrane. However, the data indicates that the lone tryptophan of CooB does not insert into the membrane, as is common in protein-membranes interactions. In fact, the quenching and quantum yield results suggest the tryptophan is more exposed in the presence of membranes. Further studies are still needed for a sufficient characterization of the CooB protein. One future study is to measure the stability of CooB by monitoring the protein structure with circular dichroism, as a function of temperature or chemical denaturants. Further investigation of the CS1 pilus system could lead to better treatments for E. Coli infections.

## Experimental and Theoretical Study of Competing Dissociation Pathways of Modified Glycine Methyl Esters

Anthony-Minh N Vu<sup>1</sup>, Dale R Kerstetter<sup>1</sup>, Adam M Graichen<sup>2</sup>, Richard Vachet<sup>2</sup>  
and Michael J. Van Stipdonk<sup>1</sup>

*1. Department of Chemistry, WSU; 2. University of Massachusetts, Amherst, MA*

The goal of the study was to determine the relative activation barriers for competing dissociation pathways of meta- & para-trifluorotolylglycine methyl esters and meta- & para-tolylglycine methyl esters. The model molecules were synthesized by coupling either meta- or para- toluic and trifluorotoluic acid to glycine methyl ester using a commercially available resin-bound carbodiimide. Collision-induced dissociation (CID) experiments were performed using a Finnigan LCQ-Deca ion trap mass spectrometer. Double resonance experiments to probe the potential serial dissociation pathways were performed on a modified Bruker Esquire ITMS. Density functional theory (DFT) calculations were used to determine lowest-energy conformations of all relevant precursor, intermediate, post-reaction species, and important transition states. Our specific goal was to determine whether the presence, identity and position of electron donating or withdrawing substituents influenced the tendency for the peptides to fragment via two competing pathways by altering the strength of a specific nucleophile important to the oxazolone dissociation pathway to b-type ions. The fragments generated from the CID experiments of toluyl-glycine methyl ester were the  $b_2^+$  ion, via elimination of methanol, and the phenyl acylium ion. Double resonance experiments clearly show that the acylium ions are generated directly from the protonated molecule rather than from the fragmentation of the  $b_2$  ion. Relative intensities of the two product ions are dependent on the presence and position of a ring substituent, which is supported by the DFT results.

## Structure and Fragmentation Behavior of Metal-Cationized Phosphopeptides

Sarah Young, Samuel Molesworth, Ryan Dain, Jos Oomens, Jeffrey D. Steill, Gary Groenewold and  
Michael Van Stipdonk

*Department of Chemistry*

In this study the metal-binding tendency and fragmentation patterns of phosphoserine and a series of model phosphopeptides was investigated. The goal was to elucidate the fragmentation patterns for the phosphopeptides, and whether the dissociation reactions are sensitive or dependent on the choice of cation.

To gain a better picture of gas-phase conformation, infrared multiple photon dissociation (IRMPD) was used to determine the most probable structures for potassium and sodium-cationized phosphoserine. Structure assignment was made by comparing experimental IRMPD spectra to those predicted by density functional theory (DFT) calculations. ESI, tandem MS with CID was performed using a ThermoFinnigan LCQDeca quadrupole ion trap mass spectrometer with helium as the bath/collision gas. DFT calculations to support IRMPD experiments were performed at the B3LYP/6-311++G(3df,2pd) level of theory (scaled by a factor of 0.98) to generate probable conformations of potassium and sodium cationized phosphoserine. For CID studies, phosphoserine, alanine-phosphoserine-glycine, phosphoserine-valine-alanine-leucine, alanine-phosphoserine-valine-leucine and leucine-alanine-phosphoserine-valine were examined. The metal cations used included lithium, sodium, potassium, calcium, zinc and silver. For the IMRPD study, several minima for K and Na-cationized phosphoserine were identified. The experimental IRMPD spectra for the Na and K-cationized phosphoserine were similar, exhibiting peak characteristic both of amino acids and phosphates.

The best agreement between experimental and theoretical spectra is achieved by combining the absorptions predicted for the two lowest energy minima, both of which feature coordination of the metal cation by the carbonyl C=O and phosphate P=O groups and the C-O-P ester group.

## Tensile Pulse Generation Techniques in a Split Hopkinson Bar

J.F. Acosta\* and K.S. Raju  
*Department of Aerospace Engineering*

Experimental testing in a tensile Split Hopkinson Pressure Bar apparatus showed that the generated tensile pulse using a transfer flange methodology differs from the theoretical prediction. The transfer flange attachment technique to the incident bar and flange dimensions distort the pulse shape and also alter the pulse width. In addition to the primary tensile pulse, secondary pulses are introduced that hinder the calibration of the testing apparatus and its further application to recovery experiments to study history effects. Lagrange diagrams are used to visualize pulse propagation along the incident bar and to identify secondary pulses sources in the pulse propagation path. Geometrical parameters of the transfer flange design that prevents a proper generation and transfer of the loading pulse are identified and the effect on pulse characteristics is quantified using an Ls-Dyna explicit finite element model. Proper attachment of the flange to the incident bar is discussed and a novel technique is presented.

## First Step to Active Health - Online *Plus*: Pilot Study

Sahar B. Amini\*, Mindy L. Slimmer, Eun Young Park and Nicole L. Rogers  
*Gerontology Department*

*Purpose:* The aim of this project is to implement, and demonstrate the efficacy of, a blended delivery multi-component physical activity program. *Methods:* The experimental group (FSAH-O) consisted of 30 male and females (age =  $68.7 \pm 5.5$  yrs). The control group (N = 15;  $74.7 \pm 6.2$  yrs) was drawn from a similar project. The program consisted of flexibility, strength, and balance training, and cardio-respiratory activity. Participants met 1day/week for 8 weeks for 50 minutes of exercise at a senior center while supplementing class with home exercise 2 days/week. Participants were given access to a program web site (a user-friendly, interactive, secure, online method to motivate, educate, and track activity). Program effectiveness was assessed using the Senior Fitness Test (SFT) (chair stand, arm curl, chair sit and reach, 8-foot up & go, scratch test, and 12-min walk); balance (movement velocity (MVL), endpoint excursion (EPE), maximum EPE (MXE), and directional control (DCL) for forward (F), right (R), left (L) and back (B) movements). *Results:* No baseline difference existed between groups. Repeated measures ANOVAs revealed group x time interactions ( $p < .05$ ) on most measures. SFT improvements were noted in the FSAH-O group: Chair Stand 10%, Arm Curl 22%; Up-&-Go 8%; 12-min Walk 18%. With respect to LOS, EPE and MXE improved in two directions (R 21%, R 8%; L 7%, L 7%). The control group did not change on any variable. *Discussion:* Participating in an 8-week blended FSAH-O program improves FF, and 2 of 4 balance measures. A longer intervention may result in greater improvements.

## Not Dying from Disease: A Narrative Analysis of HIV/AIDS in the Film *Rent*

Ashley M. Archiopoli\*  
*Elliott School of Communication*

Set when AIDS was the scourge of New York City the film adaptation *Rent* follows the lives of eight characters struggling to live their lives in the early 1990s; four of whom are HIV positive or have AIDS. This research utilizes narrative criticism to analyze the characters' stories as they negotiate living their lives while they manage the physical and emotional consequences of AIDS. The platonic and romantic relationships among the characters act as the catalysts for personal growth, encouraging the characters to live their lives fully within the context of AIDS. The rock opera unfolds to reveal how Angel, Collins, Mimi, and Roger individually cope with the virus and their influences on one another.

## Near Infrared Spectroscopy Measurement of Sacral Tissue Oxygen Saturation (StO<sub>2</sub>) in Healthy Volunteers

Jessica Baumchen\*, Erin Gurss\*, Emily Hennes\*, Sue Nyberg \* and  
Gina M. Berg-Copas<sup>□</sup>

\*Dept of Physician Assistant-College of Health Professions, <sup>□</sup> KU School of Medicine-Wichita

Immobilization of patients utilizing rigid spine boards (RSB) is standard practice in the management of trauma patients. Pressure ulcers (PU) have been associated with prolonged immobilization. The possibility exists that PU formation may begin when the patient is initially immobilized, the effects not fully recognized because of limited research on the direct tissue effects of prolonged immobilization. Near-infrared spectroscopy is an emerging tool to measure peripheral tissue oxygenation (StO<sub>2</sub>). The purpose of this pilot study was to study the effects of prolonged spinal immobilization on sacral tissue oxygenation of healthy volunteers. *Methods:* This cross-sectional study measured tissue oxygenation (StO<sub>2</sub>) in 73 volunteers at baseline and then after 30 minutes of immobilization on a RSB at two sites, the sacrum and a control site not subjected to direct pressure. Data were analyzed utilizing within-subjects analysis of variance.

*Results:* There was a significant increase in the StO<sub>2</sub> percentage at the sacral (intervention) area following immobilization,  $p < .001$ ,  $r_{pb} = .48$ . No significant change in oxygenation was noted at the control site. *Conclusion:* An increase in oxygenation of sacral tissue following immobilization was an unexpected finding and may be a result of initial, rapid tissue reperfusion

## Measuring the Physical Activity Level of Two Children with Combined Cerebral Palsy and Intellectual Disability

Megan Bengtson, Stephanie Blake, Laurie Chamberlain and Jodi Runge

*Department of Physical Therapy*

Current guidelines recommend that school-age children accumulate at least 60 minutes of moderate to vigorous physical activity (MVPA) on most days of the week. Research has established a valid methodology in measuring the intensity of physical activity levels in children without disabilities via heart rate (HR) monitoring. This case report describes whether this methodology can be applied to children with combined cerebral palsy (CP) and mild intellectual disability (ID). Physical activity (PA) patterns of two children with spastic CP (1 female, 9.0 yrs; 1 male, 8.5 years) and with mild ID were evaluated during 3 consecutive school settings: physical education, classroom, and recess. Amount and intensity of PA was successfully recorded in all three settings. That is, data indicated that the female child spent a total of 98.2 minutes (73% of allotted time) whereas the male child spent  $21.1 \pm 8.8$  minutes (16.2%) in MVPA, respectively. The results suggest that it is feasible to measure the intensity of physical activity in a school setting for children with combined spastic CP and ID. Further investigations with more participants at different functional levels for CP and in other community environments will determine the extent to which this methodology can be used.

## Quantifying Male and Female Shape Variation in the Mastoid Region of the Temporal Bone

Kirsten A. Bernard and Peer H. Moore-Jansen

*Department of Anthropology*

The shape of the temporal bone of the adult human cranium, specifically the mastoid region, is documented widely in past literature as a measure of sexual dimorphism within and among human populations. Yet, past research focus primarily on the qualitative assessment of the size of the mastoid region as it varies between males and females. This study explores both standard qualitative and standard and nonstandard quantitative measures of variation, in both size and shape, of the inferiorly projecting cone-shaped process of the temporal known as the mastoid process. A set of five measurements, two of which use five non-metric scores, compiled or developed at the Wichita State University Biological Anthropology Laboratory (WSU-BAL) to better characterize the mastoid region, are recorded for 100 male and 100 female adult crania from the Hamann-Todd collection at the Cleveland Museum of Natural History and the WSU-BAL. Descriptive statistics demonstrate patterns of sexual dimorphism in the mastoid region. The results indicate that a quantitative approach provides greater consistency in identification than the qualitative characterization of the mastoid region, as it is used almost exclusively in current practice.

## Effects of Dynamic Warm-up with and Without a Weighted Vest on Lower Extremity Power Performance of High School Male Athletes

John Carter, Amber Boehner, Cori Cameron\*, Jessica Murphy and Ashley Peintner  
*Physical Therapy Department*

The purpose of this study was to compare lower extremity power performance utilizing the Margaria-Kalamen Power Test after a dynamic warm-up with and without a weighted vest. Sixteen ( $n = 16$ ) high school male football players participated in two randomly ordered testing sessions. One session involved performing the football team's typical warm-up while wearing a vest weighted at 5% of the individual athlete's body weight before performing 3 trials of the Margaria-Kalamen Power Test. The second session involved performing the same team warm-up without wearing a weighted vest before performing 3 trials of the Margaria-Kalamen Power Test. The dynamic warm-up consisted of the following dynamic exercises, which lasted 5 minutes total: straight leg kicks, forward lunges, backward lunges, heel-rear kicks, high knees, stride-outs, deep lunges, and jogging. No significant difference was found in power performance between the non-resisted and resisted dynamic warm-up protocols ( $p = 0.161$ ). It was concluded that a dynamic warm-up with a vest weighted at 5% of the athlete's body weight was not advantageous for increasing lower extremity power output in high school football players.

## What Does That Molecule Look Like? Using Tandem Mass Spectrometry, Computational Chemistry and Vibrational Spectroscopy to Determine Molecular Structure

Ryan P. Dain\* and Michael J. Van Stipdonk  
*Department of Chemistry*

Scientists wanting to determine the structure of a molecule have many tools at their disposal. Tandem mass spectrometry (MS/MS) allows one to study the fragmentation pathways of molecules, examining how a molecule will fall apart when energy is added to it through a process known as collision induced dissociation (CID). By measuring the mass and abundance of these fragments, one can make determinations about the original, or parent, species. Computational chemistry allows one to model a molecule with many different structures, determining which represents the most likely one by looking at the relative energies and theoretical infrared (IR) vibrational spectra. Vibrational spectroscopy is used because each molecule, in principle, has a different IR spectrum that depends on its structure, much like a fingerprint. The theoretical IR spectra for various structures can then be compared to an experimental IR spectrum, to establish the true conformation. Therefore, using these three tools a scientist can confidently determine the structure of a molecule, and a better understanding about the innate chemistry of that molecule.

## Synthesis of CdTe Quantum Dots of Different Sizes and their Interactions with Water Soluble Porphyrins

Sushanta K Das\* and Francis D'Souza  
*Department of Chemistry*

Progress in the synthesis of CdTe quantum dots through controlled colloidal-thermal processing and understanding of the factors that control the luminescence quantum yields of CdTe quantum dots enable us to discover technological applications as fluorescence probes for chemo sensor development and biological imaging, tunable absorbers and emitters in nanoscale electronics, quantum dot lasers and advances materials for electrochemical applications. In the present study, CdTe quantum dots of different sizes are synthesized in aqueous solution using both anionic (thioglycolic acid) and cationic (2-amino ethanethiol hydrochloride) as stabilizers. The quantum dots are synthesized in a known pH range and the quantum dots are seen to depend on specific pH values depending on the stabilizer added. Their characterization is made using various spectroscopic techniques. The size of the quantum dots is found to vary with the processing time and temperature. Additionally, interaction of the quantum dots with water soluble porphyrins is investigated using steady-state and time-resolved emission studies. Preliminary results suggest photo induced energy transfer as a mechanism of fluorescence quenching.

## The Relationship of Plantar Flexor Strength to Functional Balance in Older Adults

Amber N. Droegemeier, Kirsten A. Ensz\*, Danielle M. Hildebrand and  
Kelly S. Moore  
*Department of Physical Therapy*

The incidence of falls in older adults has been shown to increase with a decline in lower extremity strength and functional balance, as well as with performing additional tasks while walking. In examining the relationship to fall risk, specific musculature in the lower extremities has not been studied extensively. This study examined the relationship between plantar flexor muscle strength and balance as it is used in everyday tasks (functional balance). The participants were thirty-eight adults age 65 or older residing in an independent living community. Plantar flexor strength was measured using a hand-held dynamometer (HHD). The participants then performed the Timed Up-and-Go (TUG) test under three different conditions: standard TUG, carrying a cup of water, and with a cognitive task of counting backwards. The relationship between plantar flexor strength and TUG measures was explored. No significant relationship was found between plantar flexor strength and TUG test times using a two-tailed Pearson correlation coefficient analysis. Although the plantar flexors were not found to be the most important muscle group in the lower extremities to reduce fall risk, it is still important to improve overall lower extremity strength and endurance, and cognitive function.

## Member Retention in Consumer-Run Organizations

Dziadkowiec, Oliwier\*; Vu, Connie; Shagott, Todd; Reinhart, Crystal; Keele-Lien, Ashlee; Swink, Nathan; Banta, Adrienne; Hymer, Kimberly; Wituk, Scott; and Meissen, Greg

*Center for Community Support and Research and Department of Psychology*

Consumer run-organizations (CROs) have been empowering and socially supportive settings chosen by mental health consumers as a complement or an alternative to traditional mental health services. According to previous research the benefits of actively attending and participating in CROs include increased social support, empowerment, and sense of community (Brown et al., 2008; Hardiman & Segal, 2003; Nelson, Ochocka, Janzen & Trainor, 2006a; Segal & Silverman, 2002; Trainor et al., 1997). This poster will present findings from one of few longitudinal studies of mental health consumers in consumer-operate organizations in the United States. Results of this study will focus on the predictive relationship between hope, organizationally mediated empowerment, social participation, social network as related to member retention . Face-to faces interviews were conducted with CRO members from eight different Kansas CROs at baseline (N=175) and at a 12-month follow up (N=65). Discussion will focus on the reasons why some mental health consumers might be more likely than other mental health consumers to become long time CRO members and how should CROs use this information to ensure their longevity.

## Trigger Mechanisms of Progressive Crushing – Energy Absorption in Flat Plate Fiber-Reinforced Composites

\*Sana Fazal Elyas, Kian Yip Tan and K.S.Raju

*Department of Aerospace Engineering*

A study has been made of flat plate chamfer-based, crush trigger mechanisms subjected to axial compression, for use with energy-absorbing Fiber reinforced composites. This paper will focus on the trigger mechanisms in flat panels made of Newport Nb321/7781 fiber composites. Progressive crushing can often be induced by initiating or triggering fracture at one end of the plate. Crushing initiates in the highly stressed region at the tip of the chamfer and this develops into a stable crush zone. The sequence of crushing events depends on the type of chamfer and chamfer angle. The test panels would be subjected to low and high speed compression testing. We would like to validate the best optimized model for trigger mechanisms using FEA, with the experimental results.

## Possible Ageism in the Aggressiveness of Severe Sepsis Treatment

R.A. Ewing\*, D.J. Heaton\* and L.S. Hale

*Department of Physician Assistant*

Sepsis is an emerging concern among older adults, associated with high mortality. Evidence of possible ageism, in the form of less aggressive treatment, has been reported for other diseases. *Purpose:* Investigate whether age was a determining factor in aggressiveness of treatment for severe sepsis and to evaluate in-hospital mortality rates. *Methods:* A subanalysis of previously collected data was performed. This database contained 143 adult patients admitted to a 760-bed tertiary care teaching hospital from June 2004 to May 2005 with a diagnosis of severe sepsis and/or septic shock. Aggressiveness of treatment was measured by rates of compliance with the Society of Critical Care Medicine (SCCM) treatment guidelines and activation of the hospital's sepsis response team (SRT). *Results:* There were 73 patients in the older adult group ( $\geq 65$  years) and 62 in the younger adult group (18 – 64 years). SRT was activated less often for older adults (19% vs. 41%,  $p = 0.008$ ), but treatment compliance rates were similar. In-hospital mortality was higher in the older adult group, 51% vs. 27%,  $p = 0.008$ , despite similar treatment compliance rates. *Conclusion:* The decision to activate the SRT is one indicator of aggressiveness of treatment. Neither age nor activation of the SRT appeared to be correlated with treatment compliance. Although treatment compliance was similar between groups, mortality was higher in the older adults.

## Molecular Interactions between *Medicago truncatula* and *Macrophomina phaseolina*

Andres Reyes Gaige\* and Bin Shuai

*Department of Biological Sciences*

*Macrophomina phaseolina* is a soil-borne fungal pathogen that causes a disease commonly known as charcoal rot. This fungus has the potential to infect over 500 different plant species worldwide including many important crops. The fungal infection can dramatically decrease the yield of a crop due to loss in biomass, low seed quality and plant death. Currently, there is not an effective method for controlling the disease, because not much is known about the pathogen, the development of the disease or how it interacts with the plant host. Therefore, we propose to study the interactions between *M. phaseolina* and the plant species *Medicago truncatula* at the molecular level by identifying the host genes that are involved in the disease development by using a molecular genetics approach. First, we will look for a resistant *M. truncatula* plant from a mutant population. Then, we will conduct a screen in these mutant lines to look for strains that have altered susceptibility to *M. phaseolina*, and then identify the genes that are involved in host-pathogen interaction. This investigation will lead to a better understanding about the mechanisms of the disease and provide information for crop improvement in the future.

## Correlation and Predictability of Science Prerequisites and GPA/PANCE Scores among Five Cohorts of Physician Assistant Students

Jason C. Gifford\*, Randi D. Haun\* and Richard D. Muma

*Department of Physician Assistant*

The primary purpose of this study was to determine whether a correlation existed or a prediction could be made regarding PA graduates who had taken advanced undergraduate science coursework along with the required science prerequisites, and those that had not, and subsequent performance in the WSU PA program and on the PANCE. The hypothesis being that those who completed these advanced courses would have better problem solving abilities and better performance in the Program and on the PANCE. *Methods:* Study data was collected on 208 PA Program graduates from 2003-2007 who had taken the PANCE. The explanatory variables included graduating program GPA, PANCE scores, and completion (or not) of organic chemistry and/or biochemistry undergraduate course work. The sample was divided into two groups categorizing them based on completion of the standard prerequisites or the standard prerequisites plus organic and/or biochemistry. *Results:* Point-biserial Pearson correlation=no correlation between GPA and PANCE by group. Linear regression=no predictability of GPA or PANCE scores. *Conclusion:* Advanced courses (beyond standard prerequisites) were not correlated or predictive of PA program performance or PANCE scores.

## A Survey of Psychiatric Physician Assistants Determining Scope of Practice, Preparedness, and Post Grad Training

Amanda Ginther\*, Mindy Woydziak\* and Tim Quigley

*Department of Physician Assistant*

With the growing trend of specialization in health care, an increasing number of PA's are opting to specialize. Psychiatry is one of many specialties and as of 2006, accounts for only 1% of practicing PA's. Formal training specifically for psychiatry is sparse and relies heavily on on-the-job training. Since the demand for PA's in psychiatry has grown over the past 10-15 years, it is expected that the current scope of practice, level of preparedness, and post-graduate training have all been directly affected. *Methodology:* A 13 question survey assessing the scope of practice, level of preparedness, and post-graduate training in psychiatry. The survey was distributed via email using surveymonkey.com to current members of the Association of Psychiatric Physician Assistants (APPA) who have been identified by Don St. John, President of APPA. A repeat survey was emailed to non-responders in six and twelve weeks after the initial survey. *Results:* The survey response rate was 51.0% (n=51). Scope of practice was diffuse. 40% of respondents felt somewhat prepared upon entering the field of psychiatry, and 60% felt adequately prepared after 0 to 2 years in practice. In addition to PA certification, only 8% of respondents maintained other licenses or certifications pertaining to psychiatry. *Conclusion:* Overall, it appears that a PA's scope of practice has broadened over the years, yet post-grad training is sparse and proves the importance of on the job training and CME's in psychiatry.

## An Examination of Becoming a Mental Health Certified Peer Specialist

Emily A. Grant \*, Crystal Reinhart, Ashlee Keele-Lien, Nathan Swink,  
Scott Wituk and Greg Meissen

*Psychology Department*

Peer support between mental health consumers in the mental health system is not a new concept. However, the position of Certified Peer Specialist (CPS) is a recent addition to the mental health system. CPSs are people in recovery who are employed by the mental health system to provide support through sharing lived experience with those who are working on their recovery from mental illness. CPS services became Medicaid reimbursable in 2001. Since then, CPS programs have been implemented in several states. Each state has its own standardized training and certification process that CPSs complete. Kansas began having a Medicaid reimbursable CPS program in 2007. The first training session was held in September 2007, and five trainings have been held. More than 100 people have been trained to provide CPS services in Kansas. The Center for Community Support & Research at Wichita State University has conducted interviews with those who attend the training. Interviews are completed during the initial training, and again 6 months and 12 months after the training. This poster will examine the responses to the interview questions regarding their experiences of being a CPS, their responsibilities and activities as a CPS, and their incorporation into the mental health system. It will also provide background information on the development and implementation of the CPS program in Kansas. In addition, implications for CPS providers, mental health administrators, and researchers interested in peer support are provided.

## Physical Therapist Clinical Instructor Perceived Benefits and Reservations of the Clinical Instructor Role

Debra Greenwood\*, Candy Bahner, Hy-Vong Ha,  
Danette Harris and Toni Knabe

*Department of Physical Therapy*

During clinical internships, physical therapy students must be supervised by clinical instructors (CIs) who are practicing physical therapists (PTs). The willingness of CIs to take on student PTs is imperative, as approximately one third of the physical therapy curriculum is clinic based, and CIs are not reimbursed for their time. The purpose of this study was to update the body of knowledge regarding these instructors' perceived benefits of being a CI, as well as identifying reservations that would discourage them from serving as a CI. Surveys were sent to 300 CIs. The survey used a Likert scale to measure the benefits and reservations of being a CI and included a demographic section. Eighty six CIs responded who met all the inclusion criteria (29%). These individuals averaged 12 years experience as a CI. Frequency tables were constructed for responses to perceived benefits and reservations. Practice setting data were regrouped into 3 areas: acute/subacute, private practice and other. Because the data were not normally distributed, the Kruskal-Wallis test was used followed by a *post hoc* Mann-Whitney test with Bonferoni adjustment. Significant differences were found for three of the benefits questions based on practice setting ( $p \leq 0.017$ ). The perceived benefits were ranked higher overall than the perceived reservations. Further exploration of the impact of other demographics regarding these benefits and reservations, and use of a larger sample size are recommended.

## Effects of Lower Trapezius Muscle Strengthening Exercises

Rachel Haag, Robert Manske, Michael Reiman , Barbara Voegelé,  
Staci Cook and Jennie Carlgren\*  
*Department of Physical Therapy*

The lower trapezius muscle plays a significant role in normal scapulohumeral rhythm. Scapulohumeral rhythm involves upward rotation of the scapula allowing the humerus to complete available range of motion. Without this essential scapular motion, lack of shoulder mobility would hinder completion of normal daily activities. The lower trapezius functions to stabilize the scapula by resisting lateral scapular displacement and elevation produced by the serratus anterior and the levator scapulae respectively. Limited knowledge on strengthening exercises and dosage for a weak lower trapezius muscle exists. Our study was designed to determine if exercises purported to be useful, via electromyographic activity, are effective for strengthening of the lower trapezius muscle. Shoulder external rotation, prone elevation in the scapular plane, and scapular retraction were the three exercises used in this study. Fifty-five participants (33 experimental; 22 control) between the ages of 20 and 30, with no prior history of shoulder pathology within the last year participated. Lower trapezius strength was assessed with hand held dynamometer pre-training and post-training at 4, 8, and 12 weeks. A mixed 2-way ANOVA will be used to look at differences between experimental and control lower trapezius strength at the various time frames.

## Tympanometric Measures in Human Ears with Negative Middle-Ear Pressure

Jason Harader\* and Xiao-Ming Sun  
*Department of Communication Sciences and Disorders*

Tympanometry is a physiological measurement of the acoustic admittance in sound transmission through the ear canal and middle ear and has been widely used in audiology as an objective and non-invasive means to determine the function of the middle ear system. A graphic display of the measurement is called a tympanogram. Characteristics of tympanograms have been quantified with several measures, e.g., peak compensated static acoustic admittance ( $Y_{tm}$ ) and equivalent ear canal volume ( $V_{ec}$ ). In the past decades, numerous investigations confirmed the effect of several middle-ear pathologies on tympanometric measures. However, little effort has been made to specifically explore the effect of negative middle-ear pressure. The objective of the present study was to present the outcomes of two tympanometric measures ( $Y_{tm}$  and  $V_{ec}$ ) in human ears with negative middle ear pressure. Data was obtained from 77 patients' records (96 ears) at the Wichita State University Speech-Language-Hearing Clinic. Results demonstrate that substantial overlap exists in both  $Y_{tm}$  and  $V_{ec}$  measures of tympanometry between the ears with negative middle ear pressures and those with normal pressure in previous studies. These measures are unlikely useful to serve as an index in the diagnosis of negative middle ear pressure in humans. The present study also suggests that both  $Y_{tm}$  and  $V_{ec}$  tend to decrease with decreasing negative middle ear pressure.

## Which Way Are You Looking?: Establishing Eye-Direction Detection in Children with ASD

Lesley Hathorn, Kristi Santry\*, Trisha Self and Terese Conrad  
*Department of Communicative Sciences and Disorders*

Children with autism spectrum disorders (ASD) lack the ability to share attention with others. This is a key symptom for diagnosing an ASD. The inability to reference the joint attention of another negatively impacts a child's language and social skill development. This study investigated whether three preschool boys, diagnosed with ASD, could be taught to detect an adult's eye gaze direction to obtain a motivational item. If children with ASD can improve their ability to share attention, this may positively affect their language and social skill development. Preferred reinforcers were used to establish a baseline measure for each child to verify if the participants were able to locate the food after: the trainer indicated they were hiding it under one of three cups, asked the child to hide their eyes, hid the item under a cup, established visual attention with the child, and directed them to look for the item under the cup while shifting their eye gaze in the direction of the appropriate cup. During baseline, none of the participants were able to reference the trainer's eye gaze or use trainer's eye direction to locate a concealed

## An Efficient Carrier Offset Estimator for OFDM System

Gami Hiren, Heba Shatnawi, Qasaymeh M. M, Ravi Pendse and M.E. Sawan  
*Department of Electrical Engineering and Computer Science*

In this paper, we proposed a closed form solution for blind Orthogonal Frequency Division Multiplexing (OFDM) Carrier Frequency Offset (CFO) estimation employing the Rank-Revealing QR triangular factorization Method (RRQR). The advantage of using the RRQR it gives precious information about numerical rank and efficiently separates the signal space from the noise space. Computer simulations are showing the superior performance and much less processing time of RRQR compared with the method employing ESPRIT Algorithm.

## Effectiveness and Invasiveness in Patient Medical Decision Aids

Lukas Hulsey\* and Victoria A. Shaffer

*Psychology Department*

This research tested the hypothesis that including anecdotal evidence impacts treatment choice by influencing the trade-off between effectiveness and invasiveness. In addition, the role of decision-making style was examined. Participants imagined making a decision between two treatment options for angina (chest pain). Bypass is more effective, but more invasive; balloon angioplasty is less effective, but less invasive. Participants received statistics about the effectiveness of the two treatments, testimonials, or both. They then indicated their choice between the two treatment options and rated the importance of the effectiveness and invasiveness of the treatment chosen to their decision. A subset of the participants also completed the Decision Making Styles Inventory (DMI) which describes individuals on three styles of decision-making: analytical, intuitive, and regret-based. Although the presence of anecdotal evidence changes treatment choices, it does not appear to do so by changing the relative importance of effectiveness and invasiveness to the decision maker. However, ratings of the importance of invasiveness explained a significant amount of the variance in treatment choice. Therefore, the trade-off between effectiveness and invasiveness appears to be an important source of individual differences in treatment choice.

## Facies Characterization and Mechanism of Termination of a Tertiary Carbonate Platform: Rajamandala Fm., West Java Indonesia

Brad M. Jeffrey\* and Dan Lehrmann

*Department of Geology*

The objective is to better understand an Oligocene coral reef ecosystem, exposed in SW Java as a scenic ridge of karst towers. Extensive mining threatens to destroy the spectacular scenery and important geological history. Depositional environments were interpreted from field and laboratory studies. Previous studies established the system as a fringing reef in a deep marine back-arc basin. It has been debated whether the reef formed an isolated platform or if it was attached to the island arc. Results indicate an attached shelf receiving sedimentation from a landward source, due to the presence of quartz sand. Initial reef development in a high-energy environment is indicated by fractured grains. The biologically diverse reef contains massive corals, algae, and foraminifera. The slope contains delicate platy corals and experienced episodic debris-flows. Extinction of the reef is represented by deepwater limestones, indicating platform drowning. The geologic context suggests rapid subsidence. The presence of photosynthetic red algae suggests submergence was not to subphotic depths. Abundant giant foraminifera indicates delayed reproduction under stressed conditions, which may have included cool waters, increased nutrients, algal blooms, and/or influx of sedimentation. Results will improve the understanding of similar ancient and modern reefs and their response to environmental change.

## An Evaluation of Indirect Interactions between Herbivore Guilds: Effects of Meristem Miners on Flower Head Feeders

Matthew Jones

*Biological sciences*

In the study of biological control of weeds, effects of insect herbivores that attack different plant organs have long been assumed to be independent of one another. Emerging research indicates stronger interactions between herbivore guilds than was expected historically. My research focuses on damage to apical meristems of tall thistles (*Cirsium altissimum*) by stem mining insects and the indirect, plant-mediated effects of this damage on flower head feeding insects. Two specific questions were addressed: First, how does mining of the apical meristem affect tall thistle architecture, including number of branches and flower heads produced? Second, what influence does apical meristem mining have on the intensity of damage to the plant by flower head feeding herbivores? 45 adult tall thistles at three different sites (135 plants total) were tagged and assigned to levels of a “meristem-herbivore exclusion treatment” in April, 2008. For plants on which the apical meristem was protected, insecticide was applied to the apical meristem only bi-weekly. Control plants were sprayed with water or were not sprayed. I measured root-crown diameter, plant height, number of flower heads per plant, number of branches, and damage to flower heads. Effects of the herbivore exclusion treatment and site on plant growth, branching and flower head production are being analyzed using two-way ANOVA. Effects of meristem-herbivore exclusion and site on insect damage to flower heads will be evaluated using a contingency table analysis.

## Trunk Stability with Abdominal Draw-In Exercise versus Abdominal Bracing Exercise

Karim L, Marotta M, Rands J. and Thrush A.

*Department of Physical Therapy Department*

Trunk stabilization training has grown in popularity. This popularity has led to widespread use of this type of training to environments beyond rehabilitation, including personal training and performance enhancement. There are generally two accepted methods of implementing trunk stabilization training, abdominal bracing and abdominal hollowing. The purpose of this research study is to investigate the most effective stabilization method to increase trunk stability in middle aged adults. We hypothesized that there will be no significant difference in trunk stability in those who perform abdominal draw-in exercises (hollowing) compared to those who perform abdominal bracing exercises. *Experiment:* Each participant was randomly assigned into abdominal bracing or abdominal hollowing experimental groups. Rehabilitative Ultrasound Imaging measurements of the abdominal muscles were taken between muscle fascial boundaries prior to and after an 8 week trunk stabilization exercise intervention. The ability of each participant to independently stabilize their trunk was measured via trunk strength with a dynamometer. *Results:* There was no significant difference between the bracing group and the hollowing group with a repeated measures analysis of all dependent variables. *Conclusion:* Clinically, both exercises may be equally beneficial to patients. Therefore, professional judgment should guide selection and prescription of therapeutic exercises for addressing core stability.

## Static and Dynamic Warm-up in Upper Extremity Functional Activities

Shane Katz, Jeremy Jabara, Afton Sumler\*, Tim Swanson and Robert Manske  
*Department of Physical Therapy*

There has been considerable research addressing the most appropriate method to stretch lower extremities prior to functional activities; however, limited literature exists examining whether a static or dynamic stretch is best for functional activities of the upper extremity. Identifying the best method to stretch the shoulder prior to functional upper extremity activities will help to enhance rehabilitation outcomes, training, and testing. The purpose of this study is to determine whether a static or dynamic stretch will increase the functional capacity of the upper extremity. A sample of convenience of healthy males and females between the ages of 21-35 was utilized. Subjects were randomly assigned to either the static or dynamic stretching group. Regardless of the initial assignment, each subject served as their own control by performing the alternate warm-up for each functional activity. The subject's dominant arm was tested in the following activities following each stretching mode: shoulder isokinetic internal and external rotation, proprioception, distance of softball throw and a closed-kinetic chain stability activity. Data analysis consisted of paired t-test's which were used to determine if a significant relationship existed between the functional activity and the type of warm-up stretch. This analysis was performed on each subject within each functional activity.

## Relationships of Demographic Background and Practice Setting Among Practicing Physician Assistants in the United States

Justin Kelley\*, Shawn Lies\* and Richard Muma  
*Department of Physician Assistant*

The assumption has always been that minority health care providers were more likely to work in areas of need. However, no recent research has been conducted to determine this. The purpose of this study was to determine the relationships between current practice specialty and population served to demographic variables (e.g., race). *Methodology:* This cross-sectional study measured demographic and practice setting survey data. A random sampling of 10,500 PAs was surveyed. *Results:* Nearly 12% of the sample was minority (compared to nearly 25% nationally). The main results indicated minority PAs were more likely to work in underserved and primary care practices as compared to non-minorities (Underserved=31.9% vs.19.3%; Primary Care=38.8% vs. 29.3%). Separately, there was a significant relationship among all those serving underserved populations and non-married individuals and those over age 39 (more likely to serve in this setting) ( $p<0.01$ ). Household income less than \$50,000 at the time of high school graduation was significantly related to serving underserved and primary care populations (more likely to serve in these settings) ( $p<0.01$ ;  $p<0.001$ ). *Conclusion:* In this sample minority PAs were more likely to serve in underserved and primary care settings. Certain demographics among all respondents were also significantly related to service in underserved and primary care settings.

## Comparison of Dissociation Tendencies of Meta- & Para-Trifluorotolylglycine Methyl Esters and Meta- & Para-Tolylglycine Methyl Esters in ESI-MS

Dale Kerstetter\*, Idia Tokunboh and Mike Van Stipdonk  
*Department of Chemistry*

Peptide fragmentation is an integral part of an evolving field commonly referred to as proteomics. Understanding of peptide fragmentation is vital to continued proteomic research. The frame work of this study was the benzylglycine methyl ester with either a methyl or trifluoromethyl constituent in the para- and meta-positions of the benzyl ring. The glycine methyl ester was coupled to the different acids using a PS-carbodiimide resin. The acids used were p-trifluorotoluic acid, m-trifluorotoluic acid, p-toluic acid, and m-toluic acid. Synthesis was confirmed using electrospray ionization mass spectrometry (ESI-MS). Collision induced dissociation (CID) was utilized to observe the dissociation tendencies of the given molecules. The anticipated  $b_2^+$  pathway as seen in previous studies was not as readily seen for some of the molecules in this study. Density functional theory calculations were employed for the reaction pathways to determine the thermodynamic characteristics on the pathways to help explain the observed fragmentation pathways. Double resonance experiments to probe the potential serial dissociation pathways were performed on a modified Bruker Esquire ITMS. Double resonance experiments clearly show that the acylium ions are generated directly from the protonated molecule rather than from the fragmentation of energetic  $b_2^+$ .

## Progressive Crushing Energy Absorption Capabilities of Glass Fiber-Reinforced Corrugated Panel

Kian Yip, Tan\*, Sana Fazal, Elyas, K.S. Raju  
*Department of Aerospace Engineering*

Fiber-reinforced composites are widely used in aircraft structure, automobiles as well as structurally demanding fields. The study of composite structures on aircraft crashworthiness is not only crucial on improving the overall aircraft construction but also enhance the occupant safety. Theoretically, in order to avoid occupant injury during certain crash scenarios, kinetic energy has to be dissipated in order to alleviate deceleration loads on the occupants. This experimental study addresses the progressive crushing of Newport NB321/7781 E-glass fiber-reinforced corrugated panel. The crushing tests were conducted at three distinct loading speeds which is  $10^{-3}$ -in/s,  $10^{-1}$ -in/s and 1-in/s for  $[0]_n$  and  $[\pm 45]_n$  specimens, respectively and stopped when the displacement of 1-in is reached. Overall,  $[0]_n$  has approximately 15% greater initial peak load than the  $[\pm 45]_n$  for ply 4,8,12, respectively. Stacking sequence and number of ply plays a significant role in energy absorbing capability with the difference up to 30% and 40% for  $[0]_{12}$ ,  $[\pm 45]_{12}$  and  $[0]_8$ ,  $[\pm 45]_8$  accordingly.

## Empowering the Disenfranchised: Creating College Access for Foster Care Youth

Chris Kirk, Rhonda Lewis-Moss, Corinne Nilsen and Deltha Colvin  
*Department of Psychology*

College attendance has been demonstrated to be a factor in lifetime income level, quality of life, better health, and decreased strain on government financial support systems. Yet, the privilege of attending college continues to be disproportionately distributed to certain demographic groups. Among these are youth adults emerging from the foster care system. While 70% of foster care children indicate a desire to attend college, less than 10% actually do so. Kansas Kids @ GEAR UP is a program which targets foster care children in an effort to help them prepare for post-secondary education. Student participants from the Kansas Kids @ GEAR UP program were surveyed to determine their educational aspirations and expectations.

## Paleoenvironmental Interpretation of the Bandera Shale Formation, Marmaton Group, Desmoinesian Stage, Middle Pennsylvanian in Southeastern Kansas

Zach Koch\* and C.D. Burke  
*Department of Geology*

In southeastern Kansas and northeastern Oklahoma the Bandera Shale Formation (BSF) (Middle Pennsylvanian) crops out from Linn to Labette Counties in Kansas and in Nowata County, Oklahoma in units ranging from 12 cm to 20 m thick. The BSF consists of shale, sandstone, and coal, and is stratigraphically located between the underlying Pawnee Limestone and overlying Altamont Limestone Formations of the Marmaton Group. Preliminary results from 6 stratigraphically measured exposures, lithologic and petrographic analyses, sedimentary structures and fossil evidence indicate that variability in the BSF can be related to marginal marine depositional environments. Previous studies from rock exposures have interpreted the BFS to be non-marine in origin. Recently a subsurface log analysis has interpreted the BSF as mainly marine in origin. This study serves to re-interpret the environments of deposition of the BSF, its relation to sea-level fluctuations and paleotectonic history.

## Damage Detection in Metal Structures Using Acoustic Emission

Zachary Kral\*, Walter Horn and James Steck  
*Department of Aerospace Engineering*

The structural components of many machines remain in service far beyond their designed lifetimes. This is especially true in the field of aerospace structures, where aircraft, wind turbines, satellites, and other components are expected to be in service for decades. Therefore, a good maintenance system is desired, allowing these structures further service use, while maintaining efficiency and reliability from failures. The focus of this research paper is on developing an improved maintenance system, called structural health monitoring, using acoustic emission sensors and artificial neural networks to detect and analyze any damage well before any component failure occurs. To replicate a damaged component for this study, an experiment was performed, involving thin, flat panels of aluminum (Al 2024-T3) with a designed, initial crack. These panels were subjected to static loads that were increased until crack propagation occurred. Acoustic emission sensors, which detect energy released by growing cracks in the form of strain waves, were used to detect this propagation and transform the characteristics of the propagation into electrical signals. These complex signals were then analyzed through an artificial neural network system, which allowed for fast post-processing. A structural health monitoring system was found to be plausible, using real-time analysis of the aluminum panel, detecting and reporting any growing crack from a size larger than 0.05 inches, well before any failure occurred. This study proved that acoustic emission could make structural health monitoring a reality.

## Rendering Toxic Metal Oxides Inert

Joe Leonard  
*College of Art and Design*

Ceramic glazes are composed of three primary components: a flux, an alumina- bonding agent, and a glass former. These three materials can be adjusted for firing ranges as low as 1213 degrees Fahrenheit, up to 2419 degrees Fahrenheit. However, some of the oxides used are toxic, and can leach through the glaze matrix rendering them unsuitable for functional ware. One oxide is Copper Oxide, applicable in different forms: Carbonate-CuCo<sub>3</sub>, Cupric Oxide- CuO, and Sulfate-CuSO<sub>4</sub> 5H<sub>2</sub>O. All three are toxic, and have been found in previous studies to leach to the surface of a glaze that contains more than 5% Copper Oxide by weight. When acidic liquids such as citric juices, vinegar, or wine come into contact with these surfaces, mild poisons are created, posing strong health hazards to individuals. The intent of my study is to take four previously derived formulas for high temperature glazes that will reach maturity at-2284 degrees Fahrenheit, and adjust the ratios of flux to glass former and alumina to render the metal oxides encapsulated within the glaze matrix. These glazes all contain more than 5% percent Copper in its three forms, and have been labeled toxic after chemical analysis. Through incremental adjustments of the three primary materials, and the additions of auxiliary fluxes, it is my anticipation of reducing the leaching of the copper oxide to negligible levels or none at all. After maturation of the glazes I will conduct acid tests to check for leaching, and if any samples test negative for leaching, samples will be sent away for microscopic observation insuring safety on a microscopic level.

## Peer Reviews of Teaching: Are They Useful?

Masako Maeda\*, Phillip R. Sechtem\* and Rosalind R. Scudder  
*Communication Sciences and Disorders*

Peer reviews of teachers consist of formal evaluations of faculty members performed by colleagues and peers in their college or university. They are frequently used for promotion, tenure, and salary adjustments. They may also be used for formative purposes as in the development and improvement of teaching methods, techniques, and styles. Despite the purposes mentioned above, little is known about the authenticity, practicality, and usefulness of peer reviews of university teachers. The purpose of this study was to learn more about methods and uses of information gained from peer reviews of teaching, specifically in Communication Sciences and Disorders programs. Through a national survey, 115 participants from 85 programs returned information. Results showed that peer reviews are being used in many programs with mostly positive results, even though the use, format, and conduct of the reviews vary greatly among programs. The results of peer reviews were meaningful to almost 80% of the respondents, who also included comments and suggestions about the authenticity and helpfulness of reviews conducted by their peers.

## Propagator Method for Blind OFDM Carrier Frequency Offset Estimator

Qasaymeh M. M, Gami Hiren, Heba Shatnawi, Ravi Pendse and M.E. Sawan  
*Department of Electrical Engineering and Computer Science*

In this paper, a new algorithm for blind Orthogonal Frequency Division Multiplexing (OFDM) Carrier Frequency Offset (CFO) estimation is obtained by introducing the Propagator Method (PM) in conjunction with the well-known MUSIC based high resolution searching algorithm. Furthermore, the PM does not require the eigenvalue decomposition (EVD) or singular value decomposition (SVD) of the covariance matrix of the received signals; computer simulations are also included to demonstrate the effectiveness of the proposed method in comparison with other conventional methods.

## Energy Transfer Followed by Electron Transfer in a Supramolecular Boron Dipyrin-Zinc Porphyrin-Fullerene

Eranda Maligaspe\* and Francis D'Souza  
*Department of Chemistry*

Photosynthesis, the process of converting light energy into chemical energy, involves two major steps, absorption and transportation of light energy of appropriate wavelength by the antenna light harvesting molecules to the reaction center, and photoinduced electron transfer (PET) to generate charge separated entities by using the electronic excitation energy. Mimicking the “antenna - reaction center” functionality in photosynthesis by using bio-inspired synthetic model compounds is essential to further our understanding the process of bioenergetics which also holds promise for technological advances in solar energy conversion. In the present study, supramolecular boron dipyrin-porphyrin-fullerene constructs, in which covalently linked boron dipyrin-porphyrin-crown ether compounds were self-assembled with alkylammonium cation functionalized fullerenes, have been designed to achieve sequential energy transfer followed by stepwise electron transfer. The presentation will focus on the synthesis, characterization, and electron donor-acceptor assembly formation. Further, photochemical results revealing charge separation in these novel systems will be presented

## Load Rate Effects on Interlaminar Fracture Toughness of Composite Materials

Pratap Nuggehalli Nandakumar\* and K.S. Raju  
*Department of Aerospace Engineering*

The energy dissipation due to failure of composites is of particular interest for crash applications involving dynamic loading. Separation of layers or delamination which can occur in opening (mode-I) is one of the key failure mechanisms that dictates the energy absorption. In this investigation, the effects of load rate on the mode-I fracture behavior of laminated composites were studied using quasi-static experiments. The experiments were conducted on laminated beam type specimens with inserts to simulate delamination. The results showed a decreasing trend on the fracture toughness for the corresponding increase in the crack extension rate.

## Transparency and Readability Assessments of Childhood Obesity Websites

Pamela K. O'Neal

*Elliott School of Communication*

Currently, there are over 25 million U.S. children who are overweight or obese [1 & 2]. Approximately 113 million or 80% of adult Americans regularly seek health information on the Internet [3]. Parents whose children are diagnosed as overweight or obese may look to the Internet for information about how best to manage this critical health issue. The quality of the information they receive may at times be misleading or inaccurate [4]. By examining websites containing information about obese and overweight children and confirming if the content meets standards set forth by the U.S. Health and Human Services Department (U.S.H.H.S.), the transparency of childhood obesity websites can be determined. Parents who obtain information about their child's health from websites need to know (1) the identity of the site's sponsor, (2) the purpose of the site, (3) information sources utilized, (4) privacy policy, (5) if the site is evaluated and (6) how it is updated [5]. To assess the transparency and clarity of websites containing information about the management of childhood obesity, 52 websites were examined to indicate the extent to which they followed the six criteria.

## Numerical Modeling of Boiling In Microchannels

Rohitha Paruchuri\* and T.S.Ravigururajan

*Department of Mechanical Engineering*

Two-phase flows in microchannel heat sinks can increase heat removal capabilities in micro electronic devices. Two-phase flows include air-water flow and steam-water flow etc. An important aspect related to two phase flows in microchannels is the study of boiling phenomena and its characteristics. Flow boiling in microchannels raises a fundamental question on the manner in which the small channel dimension affect the bubble dynamics. Numerical analysis of boiling in two-phase flows is carried out by using Gambit and Fluent. The fluid flow and heat transfer characteristics of two-phase microchannel heat sinks are also determined. A review is carried out on flow boiling in both minichannels and microchannels

## Cybernetic answer to who, what, where, when and how: Comparative analysis of online and print newspapers in Serbia, Great Britain and the United States

Jelena Petrovic

*Elliott School of Communication, College of Liberal Arts and Sciences*

In the last 8 years, the number of the Internet users worldwide increased by 305%. The number of online newspapers increased more than 50% since 2003. In the light of these developments, this study questions if the online newspapers can be seen as a news genre distinct from its print parent. Built on the premises of genre theory, the study tests the applicability of Shepherd and Waters' (1998) classification of news cybergenres. Content analysis of the 220 front pages of the selected online newspapers from Serbia (18), Great Britain (107) and the United States (95), showed significant differences in the current trends and the state of the online newspapers in these three countries. Serbian online newspapers most closely resemble their print parent, while online dailies in the USA and GB are exhibiting features of a new news cybergenre.

## Physician Individual Differences Related to Willingness to Use a Computer-Based DSS

C. Adam Probst\*, Victoria A. Shaffer and Raymond Chan

*Department of Psychology*

Computer-based diagnostic support systems (DSS)s have been shown to reduce medication errors and treatment costs (Bates et al., 1998, Tierney et al., 1996), aid in diagnosis (Corey & Merenstien, 1987), and assist in preventative medicine (Dexter et al., 2001). While a large number of physicians have access to computer-based DSS, many physicians do not use all functions of the system (Simon et al., 2007). Therefore, the purpose of this study was to explore individual differences in physicians' willingness to employ a computer-based DSS. 59 physicians in several different domains of medicine completed an online survey. The survey contained demographic information, classification (med student, intern, resident, or practicing physician), years in practice, and several individual difference measures including comfort/familiarity with computers attitudes toward statistics, and willingness to employ a computer-based DSS. We found that physicians believe DSS to be beneficial both general and specialized medicine. They are more willing to use computer-based DSS as information systems rather than diagnostic tools. In addition, confidence in one's diagnostic ability, computer use, Internet use, and attitude toward statistics plays no major role in a physician's willingness to use computer-based DSS.

## Wichita “Twitters” about the 2008 Presidential Election: Fantasy Theme Analysis of Messages During Three Election Night Time Phases

Bobby L. Rozzell

*Elliott School of Communication*

The internet application Twitter, according to a description from its website is, "A free social messaging utility for staying connected in real time." [1] The number of users is estimated at more than one million. An average of three million messages are exchanged each day. This study, grounded in Ernst Bormann's Symbolic Convergence Theory [2] will utilize Glazer & Strauss's (1967) constant comparative method [3] to analyze the Twitter posts generated in Wichita, Kansas and surrounding area (20 mile radius.) The time frame for these messages will be three time periods during the 2008 Presidential election on November 4, 2008: 3 hours before John McCain's concession speech, the time period between the beginning of McCain's concession and the end of Barack Obama's acceptance speech, and 3 hours after the close of Obama's acceptance speech. [1] Twitter home page, twitter.com retrieved November 4, 2008 [2] Bormann, Ernest G. (1985). Symbolic convergence theory: A communication formulation. *Journal of Communication*, 35, 4 [3] Glaser, B. (1965). The Constant Comparative Method of Qualitative Analysis. *Social Problems* 12, 4.

## Free-Time Leisure Activities

Kylea Schrag\* and Kathy Stratman

*Communication Sciences and Disorders*

Literacy continues to be important during the secondary school years; however, during middle school motivation to read is known to decline (Hughes-Hassell & Rodge, 2007; Moss & Hendershot, 2007; Pitcher, et al., 2007; National Institute for Literacy, 2007). There is little research on how adolescents spend their free-time especially activities that could include reading (Nippold, Duthie, & Larsen, 2005). Less is known about differences in urban or rural communities. The purpose of this study is to determine to what extent sixth graders in an urban and rural public school differ in their preferred types of literacy activities, amount of time spent engaging in literacy activities, and the effect of time spent doing homework on leisure reading.

Approximately 30 students from both urban and rural 6<sup>th</sup> grade classes participated. Data were collected using a multiple choice survey constructed to obtain information about student's free-time activities as they relate to time spent engaging in literacy activities and homework.

Comparisons were made between sixth grade students time spent engaged in assigned reading, reading for fun, and homework. Preliminary data indicated a significant difference in the amount of time urban boys and urban girls read for fun. Results also indicate that urban students read more than rural students.

## An Improved Frequency Estimator

H. Shatnawi\*, Qasaymeh M. M, Gami Hiren and M.E. Sawan

*Department of Electrical Engineering and Computer Science*

A novel method of estimating the differential delay of a sinusoidal signal is considered. The new method utilizes the Propagator Method (PM) which does not require the eigen-decomposition of the cross-spectral matrix (CSM) in estimating the signal frequencies. Such estimates frequencies are based on the observation and/or covariance matrices. Computer simulation is performed to validate the new procedure.

## Impact of the First Step to Active Aging on Older Adult's Functional Fitness, Balance, and Daily Activity

Mindy L. Slimmer\*, Eun Young Park and Nicole L. Rogers

*Gerontology*

To determine how the First Step to Active Aging (FSAH) program impacts functional fitness (FF), balance, and daily physical activity (DPA) in older adults. The FSAH group consisted of 18 women. FSAH group met at a senior center for 11 wk, 2d•wk for a 50 min. training program (flexibility, strength, balance, aerobic). The control group consisted of 15 women. Program effectiveness was assessed using measures of FF (chair stand, arm curl, sit & reach, up & go, scratch test, and 12-min walk), balance (movement velocity (MVL), endpoint excursion (EPE), maximum EPE (MXE), and directional control (DCL) for forward (F), right (R), left (L) and back (B) movements), pedometer measured DPA, and weight. No baseline difference existed between groups. Repeated measures ANOVAs revealed group x time interactions ( $p < .05$ ) on all measures except flexibility. After 11 weeks, FF improvements were noted in the FSAH group: Chair Stand 46%, Arm Curl 25%; Up-&-Go 8%; 12-min Walk 13%. With respect to LOS, MXE improved in all directions (F 18%, R 14%, B 23%, L 10%) and DCL improved in the F direction 9%. DPA also increased from 3,108 to 5,077 steps (38%). The control group did not change in any variable. Participating in a FSAH program improves FF.

## Electropolymerization of Triphenylamine appended Zinc Porphyrin to form Porphyrin-Fullerene dyads at the electrode surface for photochemical studies

Navaneetha K. Subbaiyan\* and Francis D'Souza

*Department of Chemistry*

Porphyrins are one of the most studied organic chromophores due to their roles as biological light absorbers, redox centers, and oxygen carriers. Their attractive chemical properties also qualify them to seek potential technological applications including solar energy conversion, sensors, catalysts, biomedicine, molecular electronics, and photonics. Many of these applications require the porphyrin to be on a surface, preferably in a conducting polymer matrix. Electro polymerization is a convenient method to produce such a conducting porphyrin polymer on the electrode surface. Compared to chemical methods, electrochemical method is simple, and ensures good electrical conductivity across the interface. In the present study, we report electro polymerization of tetrakis N,N-diphenylaminoporphyrinatozinc(II) on the electrode surface. Subsequently, porphyrin-fullerene dyad are formed via axial coordination of an phenylimidazole appended fullerene. The film formation was monitored by electrochemical quartz crystal microbalance, and characterized by surface and optical methods. The newly formed donor-acceptor dyad was further utilized in photoelectrochemical applications to convert light energy directly into electricity.

## Physician Assistant and Physician Assistant Student Exposure to and Perceptions of Pharmaceutical Representatives in the Clinical Setting: A Pilot Study at Wichita State University

Matthew A. Swanson\*, Cathryn Caputo\*, Timothy Quigley and Elizabeth Ablah

*Department of Physician Assistant Studies*

A physician assistant (PA) exercises considerable autonomy in diagnosing and treating illnesses, along with the responsibility of prescribing medication. In 2006, PAs transmitted approximately 286 million prescriptions. Pharmaceutical companies thus market to physicians, medical students, PAs, and PA students to promote the use of their products. Though physician interaction with pharmaceutical marketing has been extensively researched, review of the existing literature about PA interactions revealed a lack of research. The purpose of this study was to fill this literature gap by conducting a survey that assessed WSU PA and PA student exposure to and perception of pharmaceutical representatives. *Methods:* Subjects completed a 45 question survey based upon a previous study among medical students at UCLA. The survey was distributed via a custom survey site called surveymonkey.com. *Results:* Approximately three quarters (76.3%) of the surveys were completed. All respondents verified having at least one type of interaction with the pharmaceutical industry. A majority of respondents reported being less likely to be influenced by marketing strategies than would their colleagues, a finding similar to previous studies conducted on physicians and medical students. *Conclusions:* PAs and PA students are exposed to the same influences as their MD counterparts. This implies that interventions used for MDs should also be applied to PAs. In addition, associations like the American Academy of Physician Assistants (AAPA) and Kansas Academy of Physician Assistants (KAPA) should consider additional education about PA-pharmaceutical representative relationships due to frequent interactions between the two professions.

## Design and Implementation of a Web Service for LiteOS-based Sensor Networks

\*Masaaki Takahashi, \*Basit Hussain and Bin Tang  
*Department of Electrical Engineering and Computer Science*

Wireless Sensor Networks (WSNs) enables us to interact with the physical world and receive real time information. Connecting sensors to the Internet gives users more flexibility to manage and use WSNs. In this work, we design and implement a web service for LiteOS-based WSNs to remotely monitor the light, temperature, magnet, and acceleration of the physical world. LiteOS is a newly developed operating system for the sensor motes. Taking advantage of UNIX-like shell commands and C programming language supported by LiteOS, we implement a web service that enables the users to remotely query and visualize the sensor readings. Our web service system is equipped with secure membership, a visualizer for sensor readings, and accepts parameterized queries. We show this is an easy-to-program approach to deploy web service on sensor networks.

## Attitudes of United States Physician Assistants towards Persons with HIV/AIDS

Anja K. Talley\*, Kyrie G. Webster\* and Richard D. Muma  
*Department of Physician Assistant*

Several studies have shown that a large number of healthcare workers had negative attitudes toward persons infected with HIV early in the epidemic, but a more positive shift has occurred in these attitudes over the last decade. These studies focused mostly on the perceptions of physicians, surgeons, and nurses. However, recent surveys about attitudes of mid-level providers, such as Physician Assistants (PAs), a large purveyor of health care services, are missing. *Methodology:* This cross-sectional survey was completed to determine the current attitudes of practicing PAs concerning individuals with HIV/AIDS. A nationwide randomized sample of 1,500 PAs was surveyed through the United States (U.S.) mail. The AIDS Attitudes Scale (AAS) developed by Froman, Owen and Daisy in 1992 was used as a self-reported measure of attitude toward persons with AIDS. The AAS is viewed as a reliable and valid Likert-based instrument that measures HIV/AIDS empathy and avoidance among healthcare workers. In the scale, avoidance is described as fear of contracting the disease, and empathy is described as supportive attitudes towards persons living with HIV/AIDS. The results were analyzed using descriptive, t-test, and ANOVA statistics. *Results:* The response rate was 16% (n=246). A majority had high empathy, low avoidance, and positive general attitude scores. Respondents living in the South had the highest avoidance and lowest general attitude scores compared with those living in other regions (ANOVA,  $p < .05$ ). *Conclusion:* The results were consistent with similar current studies of healthcare workers, which demonstrated supportive attitudes towards persons with HIV/AIDS.

## The Anatomy of Teenage Cliques: Communication Behavior at the 2008 Kansas State Fair and in Popular Media

Chigozirim Utah\*

*Elliott School of Communication*

Assumptions are often made about teenagers, and how they interact with one another within groups. These stereotypes are influenced largely by how teenagers are portrayed in the media and popular culture, and are indicative of how teenagers are viewed and characterized by society [1]. This paper reports on a grounded observational study conducted at the 2008 Kansas State Fair. The researcher observed verbal and nonverbal teen relationship behavior within the self-contained, unrestricted context of the Freak Out ride, where there was minimal presence of parents, teachers, and older authority figures. This context was chosen because it was designed to appeal to teenage participants through the use of popular music, young, attractive carnival workers, targeted games, and daring rides. Comparisons and contrasts will be made between the teenage clique and group relationships observed at the Kansas State Fair, and teenage clique representations in popular media, specifically TV shows and movies. Findings from this study will also be applied to academic research on teenage friendships, clique behaviors and stereotypes.

## Tensile Stress Concentration due to Counter Sunk Holes in Adhesively Bonded Layered Aluminum

Bharadwaj Veera Raghavan\* and K.S. Raju

*Aerospace engineering*

The adhesively bonded layered aluminum is used in aircraft structures to avoid knife edge situations when flush head fasteners are used with minimum gage skins. A 3-D finite element model was used to estimate the location and magnitude of stress concentration under remote tension for aforementioned. The influence of the countersunk depth and adhesive properties on the stress concentration was investigated for a counter sunk angle of 100 °. The stress concentration was found to be maximum at the countersink edge for  $E_{adh}/E_{al} > 0.1$  where as it is slightly below the countersink edge in straight shank portion for  $E_{adh}/E_{al} < 0.1$ . Stress concentration was found to be minimum when the adhesive is positioned in the countersunk section

## PEM Cells-Performance, Durability and Role in Energy Storage

Yaamunan Venkatesan\* and T.S.Ravigururajan  
*Department of Mechanical Engineering*

Polymer Electrolyte Membrane (PEM) fuel cells are used for transport, portable as well as stationery applications over a range of temperatures. It transforms chemical energy into electrical energy. Its current applications are in mobile phones, laptops, space crafts, base load power plants etc. Fuel cells are becoming widely accepted as a preferred means of generating electricity for distributed electrical power generation because of their high fuel conversion efficiency, environmental compatibility and reliability, noise free operation. When used as an energy storage device, the fuel cell is combined with a fuel generation device, commonly an electrolyzer, to create a Regenerative Fuel Cell RFC system, which can convert electrical energy as a storable fuel and then use this in a fuel cell reaction to provide electricity when needed. The key to the effectiveness of an RFC system is the ability to separate the energy storage function from the power conversion function allowing each to be optimized. PEM cells are cost effective when compared to the regular batteries. The paper addresses the state of art in Fuel Cell technologies and the challenges faced in commercializing it. Included in the discussion are parameters and issues which affect its performance and durability.

## Synthesis and Biological Evaluation of Drug-Carrying Magnetic Nanocomposite Particles for Targeted Drug Delivery

Wamocho, H.L\*, Misak, E.H. and Asmatulu, R.  
*Department of Mechanical Engineering*

Drug-carrying magnetic nanocomposite spheres were synthesized using  $\text{Co}_0.5\text{Zn}_0.5\text{Fe}_2\text{O}_4$  nanoparticles and poly (D,L-lactide-co-glycolide)(PLGA) for the purpose of magnetic targeted drug delivery. Magnetic nanoparticles (MNP) (~10 nm) were prepared by a chemical co-precipitation of sulphate salts in the presence of sodium hydroxide. Oil-in-oil emulsion/solvent evaporation technique was conducted at 7000 rpm and 1.5-2 hrs agitation for the synthesis of nanocomposite spheres. Specifically, PLGA and the cancer drug 5-Fluorouracil were first dissolved in acetonitrile (oily phase I) and combined with MNP. The drug, MNPs and polymer solution was added drop-wise into viscous paraffin oil combined with Span 80 (oily phase II). 10%, 15% and 20% of MNP in the nanocomposite spheres were evaluated in terms of particle size, morphology and magnetic properties using X-ray and SQUID, Fluid flow and Biological trials were carried out to determine their effectiveness in targeted drug delivery

## Evaluating a Community Health Center's Diabetes Project: A Strategy to Reduce Health Disparities

Shoshana Wernick\* and Rhonda Lewis-Moss

*Department of Psychology*

Diabetes poses a serious health problem in the African American community who experience significantly higher rates of diabetes and diabetes complications when compared to Caucasians. Archival data collected at a local community health care center from patients who participated in a Diabetes Project from 1998 – 2008 was evaluated. There were 216 participants -- 143 (66.2%) African Americans, 55 (25.5%) Caucasians, and 15 (7%) Other. Twenty six (10.3%) had Type 1 diabetes, and 190 (90.3%) had Type 2 diabetes. The overall hemoglobin HbA1c, blood pressure (BP - systolic and diastolic), lipoprotein LDL cholesterol, and body weight (BMI) was measured at baseline and at the last visit. The results showed that three of the five pairwise comparisons were significant – HbA1c, BP, and LDL. Although the results indicated that there were no statistically significant differences between baseline and last measures among gender, race, and age group, there were some differences between these groups that are worthy of noting. Limitations and implications for practice will be discussed.

## Sequential Energy Transfer Followed by Electron Transfer in Newly Synthesized Molecular Tetrads.

Channa A Wijesinghe\* and Francis D'Souza

*Department of Chemistry*

Light energy absorption & transportation processes are fundamental events in natural photosynthesis. In the studies of mimicking these events it is customary to have a system comprising donor-acceptor conjugate with light harvesting antenna. In these studies well-known porphyrin-fullerene donor-acceptor dyad and functionalized borondipyrrin (BDP) as energy harvesting unit were used. Borondipyrrin was functionalized with different antenna moieties and ferrocene derivatives for broad band light absorption and charge stabilization processes.

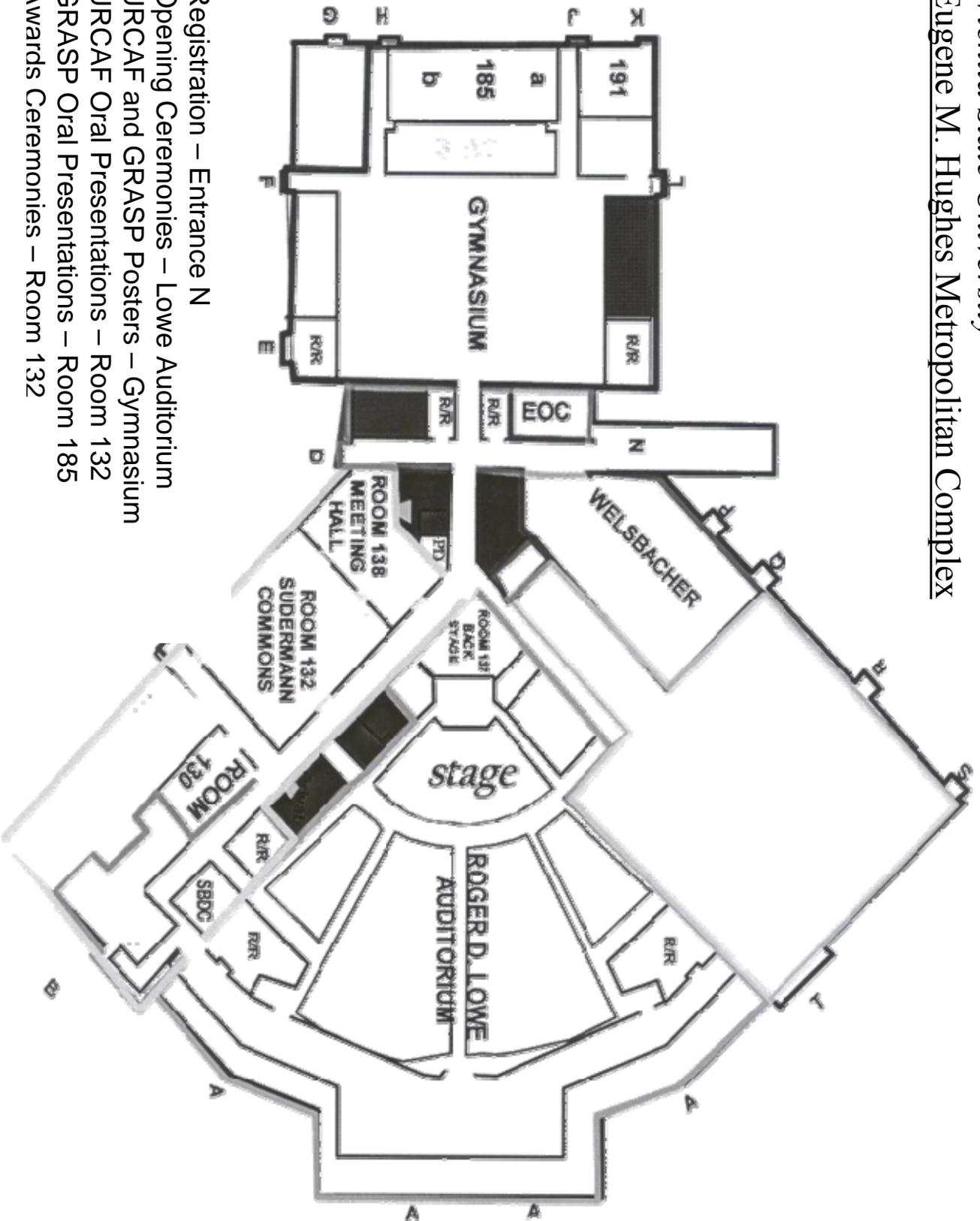
## Case Report: Nitrofurantoin-Induced Pulmonary Toxicity

Ryan Todd Wilkin\*, LaDonna S. Hale and Richard A. Claiborne  
*Department of Physician Assistant*

Nitrofurantoin is commonly prescribed to treat and prevent uncomplicated urinary tract infections. Although generally considered safe, one rare but serious side effect is chronic pulmonary toxicity. *Purpose:* Describe a single incident of chronic nitrofurantoin-induced pulmonary toxicity that was nearly overlooked, in part, due to poor chart documentation of home medications. *Case Report:* An 89 year old female presented to the emergency department (ED) with a one month history of fatigue, nonproductive cough, and weakness. Chest radiograph demonstrated extensive interstitial changes with bilateral cyst formation or possible cavitation. Because of incomplete medication histories documented in nursing, ED, and pulmonary consult records, prior chronic nitrofurantoin use was not recognized. On day two of hospitalization, a complete home medication list was obtained and all medications resumed. It was then that the use of nitrofurantoin was recognized and a diagnosis of chronic nitrofurantoin-induced pulmonary toxicity was made. A chest radiograph performed 22 months later demonstrated resolution of toxicity. *Conclusion:* Poor documentation of home medications coupled with the rarity of occurrence of this adverse reaction and slow insidious onset of symptoms created a diagnostic dilemma for clinicians. Describing this relatively rare adverse reaction to a commonly prescribed antibiotic may remind clinicians to consider drug toxicity in patients who develop new onset of pulmonary symptoms while taking nitrofurantoin. This case also highlights the importance of thorough documentation and awareness of home medications in making accurate diagnoses.



*Wichita State University*  
Eugene M. Hughes Metropolitan Complex



Registration – Entrance N

Opening Ceremonies – Lowe Auditorium

URCAF and GRASP Posters – Gymnasium

URCAF Oral Presentations – Room 132

GRASP Oral Presentations – Room 185

Awards Ceremonies – Room 132