# 10th Annual
# Capitol Graduate Research Summit

February 14, 2013

Featuring Graduate Student Research from:

Kansas State University
The University of Kansas
The University of Kansas Medical Center
Wichita State University

The Graduate Deans and Graduate Students of KU, KUMC, KSU and WSU wish to gratefully acknowledge the support and co-sponsorship of the Capitol Graduate Research Summit from the Kansas Bioscience Organization and its President and

# Presenters and Poster Titles

## Kansas State University

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| **Feraidon Ataie** | UTILIZATION OF HIGH LIGNIN RESIDUE ASH (HLRA) IN CONCRETE MATERIALS |
| **Katie Burke** | |

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| **Stephanie Bishop** | A CLICK CHEMISTRY-MEDIATED APPROACH TO UNDERSTANDING SURVIVIN: CASPASE-9 PROTEIN-PROTEIN INTERACTIONS |
| **Marlene Pietrocola** | NURSE PERCEPTIONS OF THE BARRIERS ASSOCIATED WITH REACHING AN 80% BACCALAUREATE PREPARED NURSING WORKFORCE IN RURAL KANSAS BY THE YEAR 2020 |
| **Lauren Ptomey** | AN INNOVATIVE WEIGHT LOSS PROGRAM FOR ADOLESCENTS WITH INTELLECTUAL AND DEVELOPMENTAL DISABILITIES |
| **Lei Qiu** | THE HISTONE DEMETHYLASE JMJD2B REGULATES GENES THAT CONTRIBUTE TO OVARIAN CANCER METASTASIS |
| **Natalie Tarbutton & Alison Nuttle** | RETROSPECTIVE CHART REVIEW OF DISTRESS AMONG CANCER SURVIVORS |

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| **Joseph Brungardt** | THE ROLE OF PALLADIN IN METASTATIC CANCER AS IT AFFECTS ACTIN BINDING, BUNDLING, AND POLYMERIZATION |
| **Laina M. Burdiek** | A NORMATIVE STUDY ON WIDEBAND TYMPANOMETRY AND ENERGY REFLECTANCE IN HUMAN EARS: EFFECTS OF REPETITIVE MEASUREMENTS |
| **Karin Hampton Cernik** | DO EPISTEMOLOGICAL BELIEFS AND WAYS OF KNOWING PREDICT REACTIONS TO A CHILD WITH ASPERGER SYNDROME? |
| **Michelle Dreiling** | BEYOND ANNIE OAKLEY: AN ANALYSIS OF PORTRAYAL OF MARKSWOMEN |
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**UTILIZATION OF HIGH LIGNIN RESIDUE ASH (HLRA) IN CONCRETE MATERIALS**

***Feraidon F. Ataie*** *and Kyle A. Riding*
*Department of Civil Engineering, Kansas State University*

h lignin residue (HLR) is documented. HLR, a byproduct of bioethanol production from corn stover, is actually dilute acid pretreated and enzymatic hydrolyzed corn stover. Based on heat of hydration, calcium hydroxide consumption, and compressive strength experiments, it was concluded that the ash produced by burning HLR is a very reactive pozzolanic material that can be used as a partial replacement of cement in concrete materials. Thus, HLR which are byproducts of biochemical conversion of AR can be utilized as valuable materials for CSMs production for concrete.

**MEASURING GULLY EROSION IN TWO DISTURBED KANSAS LANDSCAPES**

***Katie Burke***
*Department of Environmental Planning and Design, Kansas State University*

Gully erosion creates human safety hazards, soil loss, and sediment and nutrient pollution.

, Daniel U. Thomson[1], *and Gary A. Anderson*[2]
[1]*Department of Clinical Sciences, Kansas State University;* [2]*Department*

inclusion increased (0 20%), ER decreased (4.1-3.5) for the 353 RPM and fluctuated for 453 RPM (2.7 3.7), while expansion for baked kibbles was not evident (0.96). With the absence of mechanical shear, PD was 56% higher in the baked product than the extruded product indicating

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Precipitation has direct impacts on agricultural production, water resource management, and recreational activities. Thus understanding rainfall trends is important, especially for states like Kansas that experience a highly variable climate. The annual rainfall trends were analyzed using precipitation data from 1890 through 2011 from 24 long- term stations in Kansas. The overall analysis showed that on average western Kansas received 500 mm annual rainfall with a gradual increase of up to 1000 mm along the eastern border. In addition, a gradual increase was found in the state average total annual rainfall with a greater increase for recent years (1956 through 2011) and in the eastern part of the state. A change-point analysis was conducted to determine if the trend in increasing annual rainfall had an abrupt change. The Pettitt and CUSUM methods were used to detect the change points for all 24 stations. The Pettitt method detected a significant change-point in 12 stations and CUSUM detected a significant change -point in 9 stations. These stations were spread across the state with no special tendency. In addition, the change-points vary across the state, with the earliest one happened in 1939 for Lakin in southwest and the latest one happened in 1981 for Winfield in south, which emphasizes the rainfall variability across the state. The most significant change-point occurred in 1981 for Winfield. The majority of change-points were a start of an increase in the trend except for St. Francis, which had an increasing trend from 1908 to 1950 and a decreasing trend from 1951 to 2011.

## GOT ID? AN ANALYSIS OF VOLTER ID LAW

***Chelsie Bright***
*Department of Political Science, The University of Kansas*

In the spring of 2011, Kansas passed a law requiring all voters to show photo-identification when voting. County clerks were tasked with informing voters about how this new law would affect the 2012 election. Some clerks used advertising materials that stress the fact that voters must have photo identification to be allowed to vote. Other clerks produced materials assuring voters that their votes will be counted, via the provisional balloting process, even if they do not have approved photo-identification. There have been concerns that voter identification laws could reduce election turnout. How these new laws are advertised may play a key role in the number of registered voters turning out to vote. Our research compares the requirement-focused advertising with the advertising assuring voters that all votes will be counted, and assesses the impact that each advertising strategy has on turnout. Some counties in Kansas sent voters requirement-

information to voters. This variance creates a natural experiment, allowing us to assess the impact of advertising on turnout in the 2012 election. Employing a quasi-experimental design, we compare precinct-level turnout data from counties using both advertising strategies. Precincts in counties with no advertising are used as a baseline, allowing for a clear assessment of the impact of advertising. The results of our analysis will provide policy relevant information to both local and state public officials in the state of Kansas.

## DEVELOPMENT OF A PROCINE MODELTO CHARACTERIZE THE WOUND HEALING OF TRANSCUTANEOUS OSSEOINTEGRATION PROSTHESES

***Kevin Colbert***
*Department of Bioengineering, The University of Kansas*

One quarter of the 1.7 million US lower limb amputees consider their quality of life to be poor to extremely poor because of soft tissue sweating, irritation, and sores associated with their socket-stump artificial limb. A surgical method has been developed in Europe to circumvent the noted soft tissue problems by redirecting ambulatory forces back to the skeleton using an implant that is permanently fixed through the skin (transcutaneous) to enable direct bone anchorage of a prosthetic leg. This research develops a porcine model to study the wound healing of transcutaneous prosthetics by characterizing infection concerns. This is the first known animal model with similar skin characteristics to the human condition in which an axially-loaded1 0 0 1 21.775

# INTEGRATED APPROACH TO ALGAL BIOFUELS: OVERCOMING CHALLENGES FOR NEW INDUSTRY

***Griffin Roberts*[1]**, *Marie-Odile Fortier*[2], *BelindaSturm*[2], *Susan Stagg-Williams*[1]
[1]*Department of Chemical and Petroleum Engineering, The University of Kansas;*
[2]*Department of Environmental Engineering, The University of Kansas*

In recent decade significant resources (state and

# MEASURING THE EFFECTIVENESS OF INTERDISCIPLINARY FIELD STUDIES FOR GENERAL STUDENT POPULATIONS AT COMMUNITY COLLEGES

***Benjamin Wolfe***

*Department of Educational Leadership and Policy Studies, The University of Kansas*

Two-year colleges and open-access institutions face a struggle in teaching college level science curriculum to often under-prepared students, many of whom require developmental course work in English, reading, and mathematics. Most of these students are non-science majors pursuing general education course work for transfer to four-year schools. Many approach the sciences with pre-conceived negative attitudes and low self-confidence. The challenge is to make science stimulating and engaging for these students. This study measures the effectiveness of an interdisciplinary science field study at a large urban Midwestern community college. Using interviews and student experience surveys, this study measures student confidence and attitudes of science, comparing students participating in interdisciplinary field studies with students enrolled in a traditional introductory geology lecture course. Student participants in the field study reported positive feelings towards science-related topics and a greater understanding of the relationship between fields of science after the trip. They reported increased confidence in Student participants in the field study also conveyed increased interest in pursuing science related degrees at transfer institutions. Our findings show interdisciplinary field studies actively engage students in scientific inquiry. Such activities illustrate links between fields of study and they provide students with greater positive, successful experiences with science as compared to traditional science lecture courses. Our results suggest interdisciplinary field study activities will result in greater scientific literacy and an increase in the pursuit of science, technology, engineering and mathematics (STEM) degrees at transfer institutions.

# AN INNOVATIVE WEIGHT LOSS PROGRAM FOR ADOLESCENTS WITH INTELLECTUAL AND DEVELOPMENTAL DISABILITIES

***Lauren T. Ptomey*[1]**, *Joseph E. Donnelly*[2], *Jeannine R. Goetz*[1], *Debra K. Sullivan*[1]:
[1]*Department of Dietetics and Nutrition,* [2] *Cardiovascular Research Institute, Department of Internal Medicine, Cardiovascular Research*

Wichita State

# DO EPISTEMOLOGICAL BELIEFS AND WAYS OF KNOWING PREDICT REACTIONS TO A CHILD WITH ASPERGER SYNDROME?

***Karin Hampton Cernik**, and Marlo Schommer-Aikins*
*Department of Education, Wichita State University*

This study explored the relationship between epistemological beliefs, ways of knowing, parenting styles, and how one reacts to a child with Asperger Syndrome acting out in public. The purpose was to determine if epistemological beliefs, ways of knowing, and/or parenting style predict how an individual would respond in such a situation. Epistemological beliefs, or beliefs about the nature and source of knowledge, looked at were certain knowledge and omniscient authority. Ways of

## ARE E-TEXTBOOKS THE EDUCATIONAL TOOLS OF THE FUTURE?

***Jo Jardina,*** *and Barbara Chaparro*
*Department of Psychology, Wichita State University*

Many schools and universities are starting to offer e-Textbooks in place of traditional paper textbooks. E-Textbooks are offered via a variety of reader applications, each having its own user interface for page navigating, search, annotation, and highlighting of text. This study investigated the efficacy of two e-Textbook reader applications, Kindle and Inkling, for an Introductory Psychology text. 40 participants completed tasks during a simulated study session for an open-book quiz using one of the applications. The ability to use the e-Textbook to make notes, bookmarks, highlights, and to navigate throughout a chapter were examined along with user satisfaction, perceived workload, engagement, and comprehension. Results showed that use of both applications resulted in similar levels of comprehension of the material as well as satisfaction, perceived workload, and engagement. Participants were less successful and reported the Kindle to be more difficult to find material using the Table of Contents and to find previously highlighted text than Inkling. Turning pages, however, was reported to be more difficult with Inkling than Kindle. Participants were overall positive about the use of the e-Textbook as a study tool stating that information was easier and faster to find than when using a paper textbook. They also preferred its light weight and portability to a traditional book. Details on these findings and user interface design recommendations for e-Textbook reader applications will be discussed.

## DISTRACTED WHILE DRIVING: A COMPARISON OF THE EFFECTS OF TEXTING AND TALKING ON A CELL PHONE

***David Libby,*** *and Alex Chaparro*
*Department of Psychology, Wichita State University*

In the United States, 39 states have passed legislation banning texting while driving. By comparison, no state bans hands-free cellular phone use by adults while driving. The concern regarding texting reflects an underlying assumption that it poses a greater risk than talking on a cellular phone. However, there have been few published studies directly comparing these two tasks and their effects on driving performance. We conducted two experiments comparing the effects of talking on a cell phone and texting on driving performance. Experiment 1 was to compare the effects of texting and talking on a cellular phone on simulated driving performance. The results show that texting has a pervasive negative effect on mean speed, reaction time and eye movements relative to talking on a phone. The difference in performance might be due to the fact that texting often takes longer to perform than replying verbally. Experiment 2 investigated the effects of texting and talking on a cellular phone on simulated driving performance while equating task duration. After equating the time spent on each task, texting still had a greater impact on driving performance. Drivers in the texting condition had significantly slower reaction times, had more eye movements, drove more slowly and failed to detect as many peripheral letter targets compared to during the calling condition. The visuo-motor demands associated with text entry including the need to look away from the roadway to enter and confirm the text reply may account for the deleterious effects of texting on driving performance.

## SPLITTING WATER MOLECULES VIA CONDUCTIVE NAMOMATERIALS FOR HYDROGEN PRDUCTION

***Vishal Nageshkar,*** *Emil Jurak, Madhulika Srikanth, and Ramazan Asmatulu*
*Department of Mechanical Engineering, Wichita State University*

One of the main topics of discussion at every multi-national forum is about the fossil fuel depletion and carbon footprints. It is believed that the world will run out of cheap oil in 30 years, causing energy costs to rise, and probably hitting the economies of many nations. Time is now to look for alternative sources of energy, so that a gentle transition from fossil fuels to renewable sources can take place. While several research programs are being conducted mostly on the sun and wind energies, there is one more source that covers 71% of the Earth surface, which is water and unique to the Earth. Splitting water using electrolysis forms oxygen and hydrogen molecules. Hydrogen has several uses in energy generations, including fuel cells, hydrogen-powered engines, heating, and many others. In this experiment, conductive nanoparticles, such as graphene, carbon nanotubes, $C_{60}$, and indium tin oxide, were added into pure water with 10% of sulfuric acid solution, dispersed very well, and then electric current is passed through the dispersion at different DC voltages. During the tests, hydrogen gas was formed at the cathode, the negative side of the cell. The industrial hydrogen production using acid and pressure is very costly, and cannot compete with the fossil fuels. However, adding the nanoparticles increased the yield of hydrogen at lower voltages up to 10 fold. If the overall process is successful at a larger scale, the hydrogen production will be considerably low for the future energy demand of the world.

## COMBAT IDENTIFICATION TRAINING USING AN AUGMENTED REALITY LEARNING SYSTEM

***Dustin Smith,*** *Melissa Chinn, and Joseph Keebler*
*Department of Psychology, Wichita State University*

Combat identification (CID) is a high priority task throughout modern warfare. However, due to the quantity of fratricide accidents, it is reasonable to question the reliability of current CID training methods. With perceptual limitations (i.e. the keyhole effect), and the increase in use of unmanned vehicles (UVs) for missions, a question arises: How do we best train operators to perform well when presented with a combat i000005901 0 396ri6 07c n:t apure ETQq0.000005901 0 396 612 reW*nB

# STATISTICAL ANALYSIS TO ESTABLISH THE RELATIONSHIP BETWEEN RADIATION CONSUMPTION AND ENERGY USE FOR MEDICAL X-RAYS

***Fernando Valenzuela***, *and Janet Twomey*
*Department of Industrial and Manufacturing Engineering, Wichita State University*

Current methods for estimating the amount of

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**NOTES:**

For more information, please contact:

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