

15<sup>th</sup> Annual  
Capitol Graduate  
Research Summit



# Presenters and Poster Titles



Kansas State University

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<b>Laura Constance</b>	ROLE OF THE GUT MICROBIOME IN RESPONSE TO VACCINATION AND VIRAL RESPIRATORY INFECTION IN GROWING PIGS
<b>Sam Fox</b>	SOIL MICROBIAL COMMUNITY SHIFTS DUE TO DIFFERENT FIRE SEVERITIES
<b>Jillian Joyce</b>	DEVELOPMENT OF EVIDENCE-BASED SCHOOL LUNCH BEST PRACTICES: A CRITICAL REVIEW
<b>Rijesh Karmacharya</b>	CALIBRATION OF HIGHWAY SAFETY MANUAL FOR 4-LEGGED SIGNALIZED INTERSECTIONS AT URBAN AND SUBURBAN AREAS IN KANSAS
<b>Ashley Kelly</b>	INSPIRING FUTURE CONSERVATIONISTS THROUGH A JUNIOR ZOOKEEPER PROGRAM
<b>Kahao Lim</b>	SUSTAINABLE RESOURCE RECOVERY FROM MUNICIPAL WASTEWATER IN A PILOT-SCALE ANAEROBIC MEMBRANE BIOREACTOR (ANMBR) AT FT. RILEY, KS
<b>Narmadha Mohankumar</b>	OPTIMIZING THE DESIGN OF THE KANSAS MESONET ENVIRONMENTAL MONITORING NETWORK
<b>Barrett Scroggs</b>	THE INFLUENCE OF PARENTAL EMOTIONAL SUPPORT ON INCOME AND WELL-BEING DURING THE TRANSITION TO ADULTHOOD: A LIFE-SPAN APPROACH COMPARING SEXUAL MINORITY AND HETEROSEXUAL INDIVIDUALS
<b>Stuart Sprague</b>	EXPRESSION OF ATGRXS17 IN MAIZE INCREASES YIELD UNDER HEAT STRESS
<b>Tom Su</b>	ENHANCE HEALTH WITH A NEW EVIDENCE-BASED TREATMENT FOR DEPRESSION





# University of Kansas Medical Center

**Lisa Larson**

PERCEPTIONS AND EXPERIENCES OF KANSAS  
BACCALAUREATE NURSING PROGRAM  
LEADERS RELATED TO NURSING INFORMATICS

**Asona J. Lui**

INTERFERON STIMULATED GENES ARE  
OVEREXPRESSED IN AROMATASE INHIBITOR-  
RESISTANT BREAST CANCER AND CAN BE  
TARGETED TO INHIBIT TUMOR INVASION

**Nicholas Marchello**

DIET QUALITY DURING WEIGHT  
MAINTENANCE IN RURAL BREAST CANCER  
SURVIVORS

**Jackie A. Thompson**

HOMEGROWN BIOMEDICAL RESEARCH:  
RESEARCH HIGHLIGHTS FROM THE GRADUATE  
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# Fort Hays State University

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**Arianne Fisher**

HOW PSYCHOPATHY AFFECTS ATTITUDES  
TOWARD OTHERS

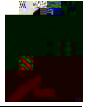
**Cyrus Green**

LONG BONE HISTOLOGY IN AN ONTOGENETIC



<b>Ahlam Alghamdi</b>	COBALT OXIDE DECORATED POLYPYRROLE: A BI-FUNCTIONAL MATERIAL FOR ENERGY STORAGE AND PRODUCTION
<b>Ren Bean</b>	PERSONALIZED DRUG-COCKTAIL NANOMEDICINE FOR THE TREATMENT OF PROSTATE CANCER
<b>Sanket Bhoyate</b>	INDUSTRIALLY PRODUCIBLE HIGH-PERFORMANCE CORN-OIL BASED FLAME RETARDENT RIGID POLYURETHANE FOAMS
<b>Hannah Martin</b>	THE IMPACT OF HOUSING AND COMMUTERS ON ECONOMIC GROWTH IN PITTSBURG
<b>Sreerupa Sanyal</b>	AN ANALYSIS ON NEWS READING AND NEWS SHARING AMONG STUDENTS AND STAFF OF PITTSBURG STATE UNIVERSITY





**Joshua Key**

LEARNING ANALYTICS AND DROPOUT  
DETECTION: DEVELOPING AN EARLY  
WARNING SYSTEM TO SUPPORT POTENTIAL  
DROPOUTS

**Brady Lund**

IMPROVING INFORMATION ACCESS IN  
KANSAS'S RURAL OPPORTUNITY ZONES

**Pardon Masarirambi**

AN INVESTIGATION TO RECOVER AND  
INDIVIDUALIZE VERTEBRATE DNA FROM THE  
GI-TRACT OF FLESH EATING BEETLES

Kansas State University





**INSPIRING FUTURE CONSERVATIONISTS THROUGH A JUNIOR ZOOKEEPER PROGRAM**

**Ashley E. Kelly<sup>1</sup>**, Jeffrey C. Skibins<sup>1</sup>, Susi Algrim<sup>1</sup>, Jared Bixby<sup>2</sup>, and Nicole Wade<sup>2</sup>  
*<sup>1</sup>Department of Horticulture and Natural Resources, Kansas State University; <sup>2</sup>Sunset Zoo, Manhattan, KS*

The recent decline in children’s engagement with nature due, in part, to our increasingly urbanized lifestyles, may produce future leaders less inclined to value and protect wildlife. Sunset Zoological Park in Manhattan, Kansas, has been a cultural and educational asset to the community for more than 80 years and is passionate about facilitating up-close explorations of wildlife as part of their mission to inspire conservation of the natural world. The Junior ZooKeeper program is a participatory summer career-sA6t





**EXPRESSION OF ATGRXS17 IN MAIZE INCREASES YIELD UNDER HEAT  
STRESS**

**Stuart A. Sprague**<sup>1</sup>, Ying Hu<sup>2</sup>, Qingyu Wu<sup>3</sup>, Jungeun Kim Park<sup>1</sup>, Ning-hui Cheng<sup>4</sup>,  
Kendal Hirschi<sup>4</sup>, Frank F. White<sup>5</sup>, and Sunghun Park<sup>1</sup>

*<sup>1</sup>Department of Horticulture and Natural Resources, Kansas State  
University; <sup>2</sup>Department of Plant Pathology, Kansas State University; <sup>3</sup>Jackson Lab,  
Cold Spri*



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**NEW KEYS TO OLD LOCKS: CELL MIMICS FOR CANCER TREATMENT**

**Angelo Andres**









**ELECTROCATALYSIS: STORING RENEWABLE POWER FOR  
TOMORROW**

**Charles Shaughnessy<sup>1</sup>, Bala Subramaniam<sup>1</sup>, Kevin Leonard<sup>1</sup>, Hyun Jin Lee<sup>1</sup>, James Blakemore<sup>2</sup>, and David Sconyers<sup>2</sup>**

*<sup>1</sup>Department of Chemical and Petroleum Engineering, University of Kansas;*

*<sup>2</sup>Department of Chemistry, University of Kansas*

This project benefits the state of Kansas by working to make renewable energy more cost effective. Currently when the wind is providing more power than can be absorbed by the grid, towers must be shut down. This problem will only increase as we build more wind turbines. This project looks to provide a method of storing the excess electrical generation in chemical bonds, providing a secondary revenue stream for operators of wind turbines. The increase in efficiency will create a powerful incentive to build more wind turbines bringing jobs and money into the rural parts of the state. We accomplish this by enhancing the electrocatalytic conversion of CO<sub>2</sub> to value-added chemicals and fuels. Specifically we are investigating the use of new electrocatalysts and reaction conditions to facilitate these reactions. We a



**PERCEPTIONS AND EXPERIENCES OF KANSAS BACCALAUREATE  
NURSING PROGRAM LEADERS RELATED TO NURSING INFORMATICS**

**Lisa Larson** and Wanda Bonnel

*School of Nursing, University of Kansas Medical Center*

**Introduction.** Managing patient health information using technology is essential for nurses to promote patient safety. Nursing informatics (NI), a combination of nursing science, computer science, and information science, manages patient health information and improv (om)25.(.01 C



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**DIET QUALITY DURING WEIGHT MAINTENANCE IN RURAL BREAST  
CANCER SURVIVORS**

**Nh**



department of biochemistry and molecular biology at the University of Kansas Medical Center, how this work benefits human health and our state, and the important role of the Kansas policymakers in sustaining graduate student success.

**TRANSCRIPTOME CHARACTERIZATION AND DEVELOPMENT OF  
TARGETED THERAPY IN JUVENILE NASOPHARYNGEAL  
ANGIOFIBROMA**

**Shireen Usman**<sup>1</sup>, Joel W. Jones<sup>1</sup>, Tran Le<sup>1</sup>, Jacob New<sup>1,2</sup>, Sumedha Gunewardena<sup>3</sup>,  
Ossama Tawfik<sup>4</sup>



**QUANTIFYING POTENTIAL THERAPEUTIC BENEFIT OF  
SPATIOTEMPORAL DOSE MODULATION FOR CANCER TREATMENT**

**Ali Adibi** and Ehsan Salari

*Department of Industrial, Systems, and Manufacturing Engineering, Wichita State  
University*

It is estimated to have 14,400 new cancer cases in Kansas in 2017 and radiotherapy remains one of the main modalities to treat them. The goal of radiotherapy is to deliver sufficient radiation dose to the tumor region to eradicate the disease while sparing the surrounding healthy tissues to the largest extent possible. To achieve this goal, radiotherapy plans for individual cancer patients are designed to deliver the desired spatial dose distribution to the patient. The radiotherapy plan will be then used on a daily basis to deliver a fraction of the prescribed radiation dose over the course of the treatment. However, there is biological evidence suggesting that additional therapeutic gain may be achieved if we allow for temporal variation in the



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**LINGUISTIC DISCRIMINATION AGAINST LATINO RESIDENTS OF  
GARDEN CITY, KANSAS**

**Drew Colcher**



**SAFEGUARDING PATIENTS DATA FOR REASONABLE HEALTH CARE COST**

**Srikanth Gampa** and Rajiv Bagai

*Department of Electrical Engineering and Computer Science, Wichita State University*

Health care providers including hospitals are required by law to publicly release their patient data, removing explicitly identifiable attributes, such as name, social security number, and address. The release of this data helps research laboratories, and federal and state governments (the state of Kansas in this case) in tasks, such as analyzing geographical movement of diseases, disease eradication, and drug discovery. For a long time, organizations believed the data to be adequately protecting patient privacy as long as all explicitly identifying attributes were removed from it. Motivated insurance companies could perform analyses to decipher people's medical history and raise premiums of those with sensitive medical history, thereby raising the overall health care cost of the society. Several sophisticated data anonymization concepts have since been proposed by the research community, of which t-closeness is a leading one. The currently available t-closeness algorithm is capable of handling only one sensitive attribute, such as a patient's diagnosed disease. We extend the state-of-the-





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**PROPOSED METHOD FOR CLEAN WATER BY ADDRE**



**HOW PSYCHOPATHY AFFECTS ATTITUDES TOWARD OTHERS**

**Arianne Fisher**

*Department of Psychology, Fort Hays State University*

Psychopathy has been related to overall negative perceptions of others in past research, but the reason for these negative attitudes is unclear. The current study investigated the relationship between psychopathy and attitudes toward others and attempted to explain these negative attitudes by testing empathy and early maladaptive schemas as mediators and social dominance orientation as a moderator for this relationship. There were 191 participants in the current study; participants first read a short story and took a scale assessing attitudes toward the characters; then, they completed the Interpersonal Reactivity Index, the SDO7, the Young Schema Questionnaire-SF, and the Levenson Self-Report Psychopathy Scale, in that order. Psychopathy was significantly negatively related to empathy and attitudes toward the characters and significantly positively related to social dominance orientation and early maladaptive schemas. Both empathy and early maladaptive schemas partially mediated the relationship between psychopathy and attitudes toward others. These results help to clarify some of the questions surrounding the interpersonal functioning of individuals high in psychopathy and could potentially be used to help create interventions to address these interpersonal deficiencies.

**LONG BONE HISTOLOGY IN AN ONTOGENETIC SERIES OF *CLIDASTES*  
(SQUAMATA: MOSASAURINAE)**

**Cyrus Green**

*Department of Geosciences, Fort Hays State University*

Osteohistology is a well-documented technique used to investigate mechanics, evolution, lifestyle, and growth in extinct animals. Previous osteohistological studies of mosasaurids have focused on adult-sized bones, but no study to date has looked at an ontogenetic series. Here, osteohistology is used to study ontogenetic changes in internal microstructure of the mosasaurid *Clidastes*. This can help in understanding how long it took to reach an adult size, allowing for a clearer picture of the animal's growth rate and lifestyle. Four humeri described as belonging to a neonate, juvenile, sub-adult, and adult were chosen to represent a size gradient. *Clidastes* (z) 1r tr. estog 3 (r) 6.7 (e) 10 (e) 01 (6) 1 (7) 50



**MULTI-SEASON OCCUPANCY MODELING AND DEVELOPMENT OF  
LONG-TERM AVIAN MONITORING PROTOCOLS AT QUIVIRA  
NATIONAL WILDLIFE REFUGE**

**Kyle Schumacher**, Liz E. Tanner, Rob Channell, Mitchell J. Greer, and William J. Stark

*Department of Biological Sciences, Fort Hays State University*

In 2014, Quivira National Wildlife refuge in central Kansas initiated a collaborative research project with Fort Hays State University to develop long-term monitoring protocols. As part of this monitoring effort breeding bird point-count surveys focused on grassland bird species were established. Survey transects contained 30 observation points arranged to investigate grassland bird community associations with habitat classifications as defined by the US Fish and Wildlife Service's National Vegetation Classification System (NVCS). Surveys yielded 14,061 observations of 48 species in 2016 and 16,304 observations of 57 species in 2017. Multi-season occupancy modeling and nonmetric multidimensional scaling were conducted to assess bird community relationships to vegetation characteristics at each observation point. As the project progresses, additional analysis of bird communities will be conducted using remote vegetation sensing and the addition of habitat management covariates.

**STRATIGRAPHIC FRAMEWORK OF SILICIFICATION IN THE MIDDLE  
SILURIAN CARBONATES OF THE ST. IGNACE DISTRICT OF THE  
HIAWATHA NATIONAL FOREST, UPPER PENINSULA OF MICHIGAN**

**Kaitlyn Gauvey**

*Department of Geoscience, Fort Hays State University*

Hand samples of the Middle Silurian dolostones in the Hiawatha National Forest, Upper Peninsula, Michigan were measured and collected in order to determine the mechanisms and relative timing of silicification. Silicified features ranged in scale from thick-bedded cherts (microcrystalline



**QUALITY OF LIFE AND SELF-EFFICACY IN OSTOMY PATIENTS IN A  
LOCAL SUPPORT GROUP**

**Callea Breiner, Colleen Paramesh, and Valerie Yu**  
*Department of Nursing, Fort Hays State University*

It is estimated that there are over one million individuals in North America living with an ostomy. This includes a colostomy, ileostomy, or urostomy. The formation of a stoma has a great impact on the patient's psychological, sexual and social well-being and patients need appropriate support to adapt to their new lifestyle. Services related to ostomy care including a local clinic or support group, have not been available in the community for 20 years. Patients travel up to 150 miles for ostomy care or to attend a support group. The purpose is to investigate the effects of a planned 12-week educational program on quality of life (QOL) and self-efficacy in ostomy patients. Synthesis and analysis of supporting literature: Physical and psychological aspects of life have shown to compromise QOL in individuals with an ostomy. Studies found that patients allocated to a specific program had improvement in QOL. Implementation of a support group in a community has shown to be beneficial and improve QOL and self-efficacy in ostomy patients. Project implementation: This quality improvement project, using Roy's Adaptation Theory, took place in Northeastern

**COBALT OXIDE DECORATED POLYPYRROLE: A BI-FUNCTIONAL MATERIAL FOR ENERGY STORAGE AND PRODUCTION****Ahlam Alghamdi<sup>1</sup>, P. K. Kahol<sup>3</sup>, Ram K. Gupta<sup>1,2</sup>***<sup>1</sup>Department of Chemistry, Pittsburg State University, <sup>2</sup>Kansas Polymer Research Center, Pittsburg State University, <sup>3</sup>Department of Physics, Pittsburg State University*

Composites of metal oxide-conducting polymer are very attractive for energy applications. The main objective of this study is to synthesize nanostructured cobalt oxide decorated on polypyrrole using a facile method for energy applications. For this first, polypyrrole was synthesized using a chemical polymerization method. In the second step, a varying amount of cobalt oxide was decorated on polypyrrole using a hydrothermal method. The synthesized materials were structurally and electrochemically characterized. The electrochemical properties were studied using cyclic voltammetry, galvanostatic charge-discharge techniques, and electrochemical impedance spectroscopy. The structural characterizations were performed using X-ray diffraction and scanning electron microscopy. The surface area of the synthesized compounds was measured using BET method. It was observed that the electrochemical properties of the composites depend on their composition. The sample with 300 mg of polypyrrole showed the maximum specific capacitance about 1533 F/g at 1 m/V with significant electrochemical stability. The composite







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**LEARNING ANALYTICS AND DROPOUT DETECTION: DEVELOPING AN  
EARLY WARNING SYSTEM TO SUPPORT POTENTIAL DROPOUTS**

**Joshua Key** and Dabae Lee

*Department of Instructional Design and Technology, Emporia State University*

Last year 3,750 students in Kansas dropped out before completing postsecondary education, according to the Kansas State Department of Education (2017). Learning Management Systems (LMS) automatically collect data about student behaviors and performance in a course, such as frequency of log in to LMS, assignment submission logs, and grades. This study seeks to address the dropout problem via use of these student data in order to identify students at risk by creating a predictive model for an early warning system. This can serve to flag potential dropouts so that an institution can intervene to prevent dropout. This study creates a predictive model



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**NOTES:**





For more information, please contact:



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