

MICHIGAN AGEP ALLIANCE FALL CONFERENCE

Kellogg Hotel & Conference Center
Michigan State University, East Lansing, Michigan
November 21, 2015

Student Abstracts CrossTalks & Posters

CrossTalks: 16 Student Oral Presentations

9:00 AM – 11:00 AM

Room 104 AB with Facilitator: Dr. Sharifa Love-Rutledge

Room 105 AB with Facilitator: Dr. Kyana Young

Poster Session: 29 Poster Presentations

12:30 - 2:00 PM

Big Ten A

MICHIGAN STATE
UNIVERSITY

MICHIGAN AGEP ALLIANCE FALL CONFERENCE

Kellogg Hotel & Conference Center
Michigan State University, East Lansing, Michigan
November 21, 2015

Student Oral Presentation Abstracts Room 104 AB

Chelle Jones

University of Michigan

Korean Sex Trade Law: Conflicting Movements & Contested Meanings

This paper investigates the effects of social movement activism on court interpretation and implementation of sex trade regulation legislation after it is enacted. Focusing on court interpretation of sex trade legislation in South Korea over the period from 1999 to present, this case study complicates the story of social movement effects by comparing the effects of legislatively victorious sex trade abolition movement with a persistent sex workers rights movement fight in the courts. The study of social movement effects is informed by a diverse literature addressing a variety of movement outcomes, including legislative victories (Giugni, 2004; Amenta, Caren & Olasky, 2005; Burstein & Sausner, 2005); mobilization, demobilization and organization (Lee, 2007; Klatch, 2004; Staggenborg, 1988); and issue framing (Snow, 1986; Keck & Sikkink, 1998; Levitsky, 2014); while still other social movement effects literature focuses on changes in behavior to assess success (McVeigh, Welch & Bjarnason, 2003), or how movements constitute some agents as morally worthy (Best, 2012). While describing social movement effects, these approaches assert a counter narrative. As feminist and human rights social movements gain increasing political influence in globally and regionally significant states like South Korea, how should we assess their effects? Is human rights legislation on sex trade symbolic or does it improve the lives of women?

Shelley Jeltema

Michigan Technological University

Creating Educational Materials for Teaching Python Programming in a GIS Context

This project created a 14-week course to teach Geographic Information Systems Science (GISS) students how to use Python to extend the functionality of Geographical Information System (GIS) software. Using a combination of a traditional college course and corporate training methods resulted in a modular course that is taught in a traditional college setting with the possibility of being presented online or as a customized course for business applications. The class is comprised of lectures and labs where students learn scripting, tool creation, and data processing utilizing Python with the ESRI ArcMap environment by accessing both ArcMap Model Builder and Python coding. A base set of lab exercises focusing on programming scripts and models for GIS analyses were developed. At the end of the course, students have experience in scripting and modeling with Python and ArcGIS. Prerequisites for this class are prior experience with ArcGIS and an understanding of modeling. Computer coding experience is suggested but not required. Future work includes continued refinement to include enhancement of existing GIS tools and models. Potential lab options include scenarios to expand the audience to engineering, surveying, business and social science audiences.

MICHIGAN AGEP ALLIANCE FALL CONFERENCE

Kellogg Hotel & Conference Center
Michigan State University, East Lansing, Michigan
November 21, 2015

Katie Yoest
University of Michigan

Estrogen Receptors Differentially Affect Motivation for Food

In females, eating behavior and weight is strongly influenced by sex hormones. In both women and female rats ovulation is accompanied by a drop in food intake and body weight (Asarian & Geary, 2006). This has been linked to changes in the female steroid hormone estrogen. Estrogen is able to bind to multiple hormone receptors; the two major estrogen receptors are estrogen-receptor alpha (ER) and estrogen-receptor beta (ER). In particular, ER has been linked to estrogen's effects on food intake and body weight, as administration of a drug that binds selectively to ER can mimic the effect of estrogen on eating behavior, while a drug that binds selectively to ER has no effect on food intake or body weight (Santollo, Wiley, & Eckel, 2007).

The current study sought to establish whether this observed decrease in food consumption is accompanied by a decrease in motivation for food. After surgical removal of the ovaries, female rats were trained to respond for a food reward. Females were then given either estrogen or one of two selective estrogen receptor agonists. Hormone priming with estrogen and the ER selective agonist both reduced motivation for food while administration of the ER selective agonist enhanced motivation for a palatable food reward. However, the effect of each agonist was reversed by prior administration of the other selective agonist. These findings suggest a complex interaction between these two selective estrogen receptors in their control of motivated feeding behavior.

Karlin Tichenor
Michigan State University

A Proposed Grounded Theory Study of the Challenges the Development and Maintenance of Romantic Relations for African-American Couples

A romantic relationship is a foundational aspect of family development, togetherness, and connectedness. Romantic relationships are the primary differentiation for human beings and other mammals. These relationships stem from emotional connections that develop long-term commitments, intimacy, and emotional safety for individuals within these relationships. For African American heterosexual couples, culture and historical experiences play significant roles in the development of romantic interactions and long-term commitments. Historically, African Americans have endured contextual challenges that negatively impact relationship maintenance. Historical Trauma Theory provides a lens to guide exploration into the process of couple development for African American heterosexual couples and the historical and contextual challenges that may negatively impact successful maintenance. In the proposed study, in-depth interviews are being conducted with African American heterosexual couples who have been married for at least 6 months and couples who have been divorced after being married for at least 6 months. Participants are recruited through word of mouth (WOM), social media websites, email invitations, and recruitment flyers. Grounded theory methodology is used to analyze data with the goal of constructing an in-depth understanding of the experiences of these couples to develop a theory descriptive of the process of developing healthy romantic relationships and enduring historical and contextual challenges to sustainability. Rich descriptions of relationship process and development, coping strategies, meaning-making processes, and adaptation will be presented, aiding in the expansion of intervention strategies to support struggling couples. Data continues to be collected for this study and preliminary assessments of data will be shared during this presentation.

MICHIGAN AGEP ALLIANCE FALL CONFERENCE

Kellogg Hotel & Conference Center
Michigan State University, East Lansing, Michigan
November 21, 2015

Isola Brown

Michigan State University

Enteric Glial Activation Drives Enteric Neuron Loss During Inflammation in the Gut

The enteric nervous system (ENS) provides local control of gastrointestinal (GI) functions including motility. The ENS is composed of enteric neurons and enteric glia (EG), a special type of peripheral glial cell that surround enteric neurons and maintain enteric circuits. Loss of glial maintenance is thought to lead to neuron death and gut dysfunction during inflammation. However, this theory is at odds with data showing that glial activation can drive neuron death during neuroinflammation in the brain. We hypothesized that activation of enteric glial can promote enteric neuron death and GI dysfunction during inflammation.

We activated EG using P2Y1 receptor (P2Y1R) activators and quantified neuronal survival with immunohistochemistry. Glial activity was monitored using Ca²⁺ imaging and ATP biosensors. We modulated glial release using genetic ablation models and by altering nitric oxide (NO) levels. Stimulating glial P2Y1Rs activate enteric glia in the GI tract. Glial activation drove ATP release through Cx43 channels and reduced neuron density by 23%. Inhibition or ablation of glial Cx43 prevented neuron death in situ and in vivo ($p < 0.01$). Cx43-dependent glial ATP release was potentiated by NO ($p < 0.05$) and Cx43 inhibition protected against NO-mediated neuron death ($p < 0.05$). Our data demonstrate a novel pathogenic role of enteric glia in enteric neuron loss during colitis where direct glial activation is sufficient to cause enteric neuron loss in a Cx43 and NO dependent manner.

Corine Jackman

University of Michigan

Understanding Bacterial Interactions in the Vaginal Microbiome Using Novel High-throughput Microfluidic Technology

There is increasing evidence which suggests that the bacteria in the human vagina, referred to as the vaginal microbiome (VMB), play fundamental roles in women's health and susceptibility to disease. For instance, bacterial vaginosis (BV), the most common vaginal infection in women of reproductive age in the United States, is characterized by disturbances in the VMB. BV is associated with 1 in 8 neonate mortalities worldwide, and an increased susceptibility to contracting sexually transmitted infections, such as HIV. In recent years, a large number of species in the VMB have been identified, many of which have never been cultured (>99%). Discovering vaginal microorganisms that have not been cultured suggests a strong dependency on a microbial species' natural environment for survival, including interactions between the host and indigenous microorganisms. The fundamental question of how cell-cell and cell-host interactions function molecularly remains largely unanswered. The proposed research uses high-throughput microfluidic technology to investigate vaginal bacterial interactions in micro-droplets. Experimentation uses as little as <200 μ L fluid and generates 1-500 droplets per second. Preliminary results have supported evidence for a commensal relationship as previously reported between two species of the VMB. Additional results have revealed microdroplet cultivation of vaginal bacteria from human vaginal swabs using 16S sequencing. The proposed microfluidic droplet co-cultivation technology platform closes knowledge gaps for detecting microbial interactions in natural microbial communities.

MICHIGAN AGEP ALLIANCE FALL CONFERENCE

Kellogg Hotel & Conference Center
Michigan State University, East Lansing, Michigan
November 21, 2015

Ruby Carillo

Michigan State University

Regulating the Light Switch for Energy Production in Plants

Photosynthesis is the process by which plants convert sunlight to chemical energy (i.e., ATP and NADPH), thereby fueling virtually all life on earth. Photosynthesis must also be finely regulated to allow for efficient solar energy storage, while preventing self-destruction through photodamage. One of the key enzymes in photosynthesis is the chloroplast ATP synthase, which is essential for the storage of photosynthetic energy in the form of ATP, a major energy currency of life. By controlling the light-driven flow of protons across the thylakoid membrane, the ATP synthase plays a key role in the regulation of photosynthesis. In turn, the ATP synthase is regulated by other factors, including the well-known thioredoxin system that activates the complex by delivering electrons from photosystem I to special redox-active Cys residues on the ATP synthase. There is strong evidence for additional, unknown regulatory factors. I will present results that led to the discovery NADPH thioredoxin reductase C (NTRC). Mutants of this protein displayed nearly normal ATP synthase activity at high light, but very slow activity at low light. Analysis of this mutant showed ATP synthase is activated through two distinct pathways: first, under low light through NTRC using NADPH as a substrate; and second, at higher light through the canonical ferredoxin-thioredoxin pathway. These results explain how ATP synthase is activated at very low light levels to prevent photodamage, while allowing for fine tuning of the enzyme activity during normal light-cycle photosynthesis.

Francisco Aldarondo

University of Michigan

Comparing Two Goods-to-Person Order Picking Systems for Online Retailing

Over the past decade, online sales has increased to nearly 8% of the total retail sales in the U.S. (U.S. Census Bureau) and it's projected to reach \$370 billion by 2017 (Forrester Research). For many online retailers, order picking (OP) is a labor-intensive activity, and it typically accounts for over 50% of their operational costs. Although many online retailers use walk-and-pick systems, a stronger alternative is goods-to-person OP, which generally improves the picker efficiency and offers ergonomic advantages. In such systems, automated equipment brings the containers to the pick station(s) where picker(s) perform the picks. In this study, we are concerned with comparing two types of goods-to-person OP systems, namely, the Kiva system and the Miniload-AS/RS (with a conveyor loop to connect the pick stations). The results are based on a simulation model that was developed for each system. Both models use the same or similar parameters. The two systems are compared on the basis of quantitative factors such as the expected throughput (picks per hour), the expected picker and equipment utilizations, and the order completion times. We also compare the two systems on the basis of certain qualitative factors that are relevant for OP systems.

MICHIGAN AGEP ALLIANCE FALL CONFERENCE

Kellogg Hotel & Conference Center
Michigan State University, East Lansing, Michigan
November 21, 2015

Student Oral Presentation Abstracts

Room 105 AB

Daniel Gomez

California State Polytechnic University-Pomona

Managerial Communication and Occupational Mobility of U.S. Dairy Farms

This research focuses on U.S. dairy farm manager's attitudes and behaviors regarding the occupational mobility of their employees. Occupational mobility refers to the movement of an individual of an occupational group either vertically or horizontally along the stratified system of occupational prestige (Marshall and Scott, 2009). Attitudes and behaviors of managers may serve decisive roles in determining employee occupational mobility. This research attempts to answer the questions: Does the rate of communication and mode of training between U.S. dairy farm managers and employees impact managerial perceptions of employee trust, laziness, and ambition on the job? Occupational mobility studies have been heavily concerned with macro-level trends, migrant networks, and language ability; primarily missing important dimensions such as communication between managers and workers and training of employees. Through secondary analysis of Human Resource Survey (n=30) and Inventory of Mastitis Practices Attitudes and Behaviors (IMPAB) focus group data among managers (n=11) collected by the Julian Samora Research Institute, I address the managerial communication, training, and attitudes toward employees by observing the training and communication processes of managers, the rate of contact of managers and employees, and manager perceptions on employee ambition, trust, independence on the job, and laziness. The survey covers farms in Michigan, Pennsylvania, and Florida. Analyses resulted in statistically insignificant findings, but suggest further paths of consideration for social scientists. By continuing investigation of managerial roles effects on the occupational mobility of farm workers, more effective Human Resource practices can advance the skills and productivity of dairy farms.

David Walton

Michigan State University

I am Black and I am Gay: A Brief Activist Biography of Simon Nkoli, 1974 -1994

This study is primarily concerned with two fundamental questions, and one sub-question. Specifically, the questions are: 1) Did Simon Nkoli face racism within the general South African gay rights movement and face homophobia within the anti-apartheid movement? If so, how did he address those challenges? 2) What was Simon Nkoli's philosophy concerning the connection between anti-apartheid activism and gay rights activism? I selected this topic because Simon Nkoli, a principle co-founder of the first national black lesbian, gay, bisexual, transgender, queer, and intergender (LGBTQI) organization in South Africa; the Gay and Lesbian Organisation of Witwatersrand (GLOW), has been marginalized in the broader black South African anti-apartheid historiography. Thus, this study is, in part, a search for the 'real' Simon Nkoli, as well as an assessment of Nkoli's role in the democratization of South Africa. Furthermore, an examination of the history and trajectory of South Africa's black gay rights movement, from the 1970s to the 1990s help explicate Nkoli's contributions to the movement and impact on post-apartheid society.

MICHIGAN AGEP ALLIANCE FALL CONFERENCE

Kellogg Hotel & Conference Center
Michigan State University, East Lansing, Michigan
November 21, 2015

John Tran
Michigan State University

Breaking Down the Wall: Inside the Makings of the Plant Cell Wall

Innovations in agricultural practices are required to meet the challenges posed by global climate change and rapid population growth, which is estimated to surpass 9.5 billion people globally by the year 2050. One possible solution is to engineer plants to become more productive and, at the same time, more robust in extreme environments. Plants contain important materials such as carbohydrates and dietary fiber in the cell wall, which play an important role in a healthy human diet. Our lab is interested in understanding the architecture of the plant cell wall by asking two fundamental questions: how is it made, and how is it regulated? Using a novel approach, we have evidence for a protein complex that likely synthesizes an important component of the plant cell wall. This finding brings us closer to understanding the mechanisms of plant cell wall formation. We plan to further identify how this protein complex is regulated and if other proteins are involved in the synthesis and regulation of this component in the plant cell wall. Our work has the potential to help improve the quality of fibrous plant material for improved uses in the production of food, forage, and bioenergy to address the challenges of the future.

Zoe Miller
Michigan Technological University

Watershed and Water Quality Modeling for Integrated Clean Water Act Planning

Combined sewer overflows (CSOs) are instances in which storm water runoff combined with raw human and industrial waste are discharged directly into natural water bodies, adversely affecting human health and the natural environment. Cleveland, Ohio is one of approximately 772 cities in the U.S. that have CSOs. These CSOs discharge into the Cuyahoga River, other rivers and streams, and directly into Lake Erie. Today, the Northeast Ohio Regional Sewer District (NEORS) manages storm water and wastewater in the greater Cleveland area, and is therefore responsible for the U.S. Environmental Protection Agency (EPA) required Long Term Control Plan (LTCP). In 2011, a Consent Decree was settled between the U.S. EPA and the NEORS, requiring the NEORS to spend 3 billion dollars over 25 years to reduce the volume of raw sewage discharged into the environment. This research integrates a suite of sewer, stream and hydrodynamic models to assess the impacts of CSOs on surrounding water quality. Results from sampling from a storm in 2014 demonstrate that using the EPA Storm Water Management Model (SWMM) is appropriate for modeling the stream hydraulics and water quality for three pollutants of concern. Future work will entail continuous simulations integrating the NEORS's proposed engineered alternatives.

MICHIGAN AGEP ALLIANCE FALL CONFERENCE

Kellogg Hotel & Conference Center
Michigan State University, East Lansing, Michigan
November 21, 2015

Teresa Clark
Michigan State University

Understanding Carbon Efficiency in Seeds

The seeds are the most economically valuable part of the major crop plants, including soybean, maize, and rice. During development, seeds receive carbon from the mother plant and convert that carbon into biomass products like sugars, proteins, and oils. While soybean seeds can convert 80% of this carbon into biomass products (the remainder is lost as carbon dioxide), other plants are much less efficient. For example, Camelina seeds only convert 40% of their carbon to biomass products. Because Camelina seeds have high oil content and are able to grow on nutrient-poor soils, there is great interest in developing Camelina as an oilseed crop. In order to improve Camelina's carbon use efficiency (and its economic value), it is important to understand why it is inefficient. To answer this, we fed developing Camelina seeds labeled carbon compounds and tracked where that label went. Using a mathematical model, we were able to use the labeling information to estimate carbon flow within the seed. We found that most of the carbon dioxide "waste" is from an unusually high carbon flow through a particular pathway that generates high-energy compounds at the expense of making carbon dioxide. Generating high-energy compounds is normally beneficial, but we estimate that more high-energy compounds are being made than what the seed is actually using. We hypothesize that engineering Camelina to have decreased carbon flow through this pathway would enable the seeds to use more carbon more efficiently and increase the production of biomass products.

Ayanna Spencer
Michigan State University

Intersectional Understanding of Sexual Terrorism and Language

This presentation explores the relationship between language and violence in the context of rape culture. A part of a larger thesis, the presentation delves into the linguistic representations of sex and sexual assault in legal discourse, media, music, and popular culture that form a flawed theory of consent. The project draws from Dr. Lynn Tirrell's work, "Genocidal Language Games", which looks at the role derogatory language played in making violence against Tutsi Rwandans more plausible in the minds of everyday people. Put in conversation with Michel Foucault's "Truth and Power, the two works assist in forming the presentation's argument that language is a social act that replicates ideological frames of violence on a local level. Linguistic violence, then, is language as an arm of a dominant power structure that replicates violent power relationships and reinforces violent systems of oppression. Through analysis on how we linguistically sanction access to women's bodies as consensual by using rhetoric that disregards women's domains, and ultimately their personhood, the project deconstructs how the ideological frame of rape culture linguistically impacts how we view our material reality. Building on Lynn Tirrell's work, I argue that sexually derogatory language perpetuates and reinforces rape culture, a culture that normalizes and accepts sexual violence. I contend that if language motivates action, then language that reinforces rape culture is a major component in propagating sexual violence. Ultimately, I claim that rape culture language is harmful and a key tool in sexual terrorism.

MICHIGAN AGEP ALLIANCE FALL CONFERENCE

Kellogg Hotel & Conference Center
Michigan State University, East Lansing, Michigan
November 21, 2015

AJ Rice

Michigan State University

Privatizing Black Power: The Detroit Free Press and Emergency Management

Michigan Governor Rick Snyder's appointment of an Emergency Manager (EM) to Detroit in 2013 signaled an important development for urban politics in the United States, with particular consequences for Black urban politics. This appointment centralized governing power in the hands of an unelected official, Kevyn Orr, disempowering the Detroit's Mayor and City Council. Despite opposition from local civic and political leaders, Orr's appointment was characterized by the Detroit Free Press as necessary because of city leaders' inability to work together, and the conclusion that they are 'unlikely,' or 'unable' to take the appropriate measures to improve Detroit's budgetary challenges. Pulitzer Prize winning journalist Stephen Henderson observed, "Detroit's elected leaders have been unable, and in many cases unwilling, to confront the horrible fiscal imbalances that leave insufficient money" for public services, including fire trucks, ambulances, police officers, and public lighting. Supporting Michigan Governor Rick Snyder's decision to appoint an EM to Detroit, Henderson urgently concludes that, "it's Detroiters, the victims of the spectacular failure of local governance in this city, who can't afford any more delay." Using the method of discourse analysis, this paper will analyze how the Detroit Free Press constructed a discourse that discredited elected officials in Detroit and for what purpose? Based on a review of Free Press articles between December 2012 and March 2013, I argue that the newspaper operated in the interest of the business class by promoting a free market ideology. The study concludes by discussing the impact of Orr's appointment on Black politics in Detroit.

Renee Oats

Michigan Technological University

Application of Photogrammetry Techniques for Condition Assessment of Infrastructure Systems and Materials

There is a great demand to deploy innovative monitoring techniques to detail the condition or performance of civil infrastructure and/or its materials. Common methods to monitor infrastructure require hands-on instrumentation, great labor, time and resources. Deploying remote sensing technologies provides a hands-off efficient way to analyze the current state of infrastructure systems. Optical remote sensing or digital technologies are sought to enable quick data collection of the material or component of interest and evaluate changes over time.

Digital imaging processing using photogrammetry principles have been shown to be comparable evaluation tools for determining alterations and quantifying changes on systems. This presentation will illustrate the application of photogrammetric-based techniques for assessing performance of structural materials and monitoring changes of a retaining wall model. Results from laboratory testing and field demonstrations validate great comparability of the photogrammetry techniques for characterizing changes and performance of materials when compared with traditional and numerical modeling techniques. This work supports the integration of digital imaging techniques as a condition assessment tool for structures and materials.

MICHIGAN AGEP ALLIANCE FALL CONFERENCE

Kellogg Hotel & Conference Center
Michigan State University, East Lansing, Michigan
November 21, 2015

Student Poster Presentation Abstracts Big Ten A

Aliya Beavers

Michigan State University

Black Student and Pell Student Physical Activity

A 2014 Michigan State University study concluded that students who participate in fitness activity have higher grade point averages than those who do not. Numerous other studies confirm that in addition to higher grade point averages, engaged college students gain positive outcomes such as leadership abilities, development of psychosocial skills, and improved critical thinking. Despite this information, students from certain populations continue to struggle to connect with the community for a variety of reasons. This scholarly research explores levels of Black students and Pell eligible students engagement with physical fitness. Recreational fitness data on 8,000+ first-year students was collected and analyzed using the statistical program SPSS. Several themes emerged from this study including reasons Black students and Pell eligible students do not engage in fitness activity; the differences in grade point averages between students who participate in fitness activity and those who do not; and recommendations for how to involve more Black students and Pell eligible students.

Anabel Flores

University of Michigan

Selective deletion of the brain-specific alpha and delta isoforms of the human obesity gene product SH2B1

The rise in obesity and its associated co-morbidities (e.g. diabetes, cancer, heart disease) makes it critical to gain new insight about regulators of body weight. Mutations in the scaffold protein SH2B1 have been identified in individuals with severe early onset childhood obesity. These individuals also exhibit hyperphagia and insulin resistance. Some of these mutations are found in specific SH2B1 isoforms. The four known isoforms of SH2B1 (α , β , γ and δ) share 631 amino acids and only differ in their C-terminal tails. SH2B1 γ and β isoforms are ubiquitously expressed, but the α and δ isoforms are expressed primarily in the brain. To study the role of the brain-specific α and δ isoforms of SH2B1 in vivo, our lab used the CRISPR-cas9 system to edit the DNA of mice to prevent the expression of the SH2B1 α and δ isoforms. We designed two potential guides (C and D) and a 4kb donor template. Following homology-directed repair, only the γ and β isoforms of Sh2b1 should be expressed. There were 17 mice generated from the single guide C RNA; 3 were correctly edited. 11 out of the 58 mice from the oocytes injected with guides C and D were correctly edited. The mice are being bred to verify germline transmission and will be metabolically phenotyped to help determine the contribution of the brain-localized α and δ isoforms of SH2B1 to body weight control, feeding behavior and energy expenditure.

MICHIGAN AGEP ALLIANCE FALL CONFERENCE

Kellogg Hotel & Conference Center
Michigan State University, East Lansing, Michigan
November 21, 2015

Andre Thompson
University of Michigan

Thermodynamic Properties of Aqueous PEO-PPO-PEO Micelles of Varying Hydrophilicity with added Cisplatin Determined by Differential Scanning Calorimetry

Differential Scanning Calorimetry was performed on a series of aqueous solutions of polyethylene oxide-polypropylene oxide-polyethylene oxide, PEO-PPO-PEO, (L101, P104, P105, and F108) amphiphiles in the low concentration regime (0-2%) to resolve the critical micelle concentrations (cmc) of the neat polymers. Work was done from 2% wt/v to 10% wt/v (in 2% wt/v increments) amphiphilic copolymer concentrations and PEO-PPO-PEO solutions co-formulated with cisplatin concentrations (0% wt/v-0.1% wt/v in 0.02% wt/v increments) to resolve any deviation in the enthalpy of micelle formation. Enthalpy-entropy compensation plots for each neat copolymer and each amphiphile solution mixed with cisplatin were obtained. Two types of behaviors were observed; a drug influenced compensation temperature profile (P104), and a drug invariant behavior (L101, P05 and F108) where the change in compensation temperature was less than 1°C. Only neat P104 was found to be profoundly influenced by the presence of cisplatin that must reorganize the interface between the hydrophobic and hydrophilic regions of the micelle. Adding cisplatin lowered Tcompensation from 302.1 to 288.8 K.

Ashley Sanderlin
Michigan State University

The Effect of Obesity on Severity of Cognitive Impairment and Neuropsychiatric Symptoms in Mild Cognitive Impairment Subjects

OBJECTIVE: To examine the effects of obesity (OB) on the severity of cognitive impairment in Mild Cognitive Impairment (MCI) and whether OB is associated with specific neuropsychiatric symptoms (NPS).

BACKGROUND: We used the Alzheimer's Disease Neuroimaging Initiative (ADNI)

Phase 1 database to obtain relevant demographic, clinical, cognitive and behavioral measures for MCI subjects. OB and NPS are risk factors for the development of dementia. However the prevalence and interaction of these non-cognitive factors within MCI has not been studied.

DESIGN/METHODS: Data within the neuropsychological battery was used to examine disease severity. Tests included Logical Memory immediate & delayed, Digit span, Category Fluency, Trails A&B, Digit Symbol, Boston Naming Test and clock drawing. NPS measures were the Neuropsychiatric Inventory Questionnaire (NPIQ) and the Geriatric Depression Scale (GDS). We used a standard definition of OB (BMI >30), overweight (OW 25-29.9) and normal weight (NW <25).

RESULTS: Our ADNI1 sample of MCI subjects (n=397) consisted of 162NW (40.8%), 169OW (42.6%) and 66OB (16.6%). BMI groups did not differ by age or MMSE, however OB had fewer years of education than both OW/NW (p = 0.01). Additionally, the prevalence of NPS was higher among OB subjects for both the GDS (p < 0.01) and the NPIQ (p = 0.03). Examination of component measures of the NPIQ indicated the most prevalent symptoms were irritability (28%) and depression (20%). A significantly higher proportion of apathy (X2 = 15.4, p<0.01), disinhibition (X2 = 6.5, p = 0.04), irritability (X2 = 8.5, p = 0.01), and appetite (X2 = 7.8, p = 0.02) were found in OB subjects.

CONCLUSIONS: This study demonstrates that within MCI specific NPS prevalence are associated with a higher BMI. Late life adiposity may play a role in the presentation of specific psychiatric symptoms *after MCI onset, which may help better characterize MCI and assess the risk of progression to dementia.*

MICHIGAN AGEP ALLIANCE FALL CONFERENCE

Kellogg Hotel & Conference Center
Michigan State University, East Lansing, Michigan
November 21, 2015

Ayushi Jharia
Wayne State University

Assessing the Mechanical Properties of Fibers Utilized in Nerve Conduits

Last year, 800,000 cases of peripheral nerve damage in the USA and Europe were reported by the UCL Center for Nanotechnology and Regenerative Medicine. Currently nerve repair methods include nerve autograft, a method where insufficient availability of a nerve that meets proper dimensions is a major drawback, and co-adaptation, a method that generates undue tension of the suturing site. A synthetic nerve conduit can be altered to meet desired dimension and mechanical properties, eliminating these disadvantages. These conduits must meet the mechanical properties that nerve holds, given the forces applied to a nerve within the human body. For example, a nerve must be flexible enough to go over joints, but maintain integrity. A synthetic nerve conduit was fabricated using 30% and 60% Methacrylated Hyaluronic Acid (MeHA). Through electrospinning methods, this polymer is spun onto a rotating mandrel to form a scaffold of aligned fibers. Tensile testing was conducted on these fibers in a dry environment using an Instron. It was found that 60% MeHA had an ultimate tensile strength of 10.93 N whereas the 30% MeHA was limited to 3.47 N. Likewise, the 60% MeHA was able to be extended 6.61 mm and only 3.65 mm using 30% MeHA before rupture. The methacrylation on the Hyaluronic Acid is concluded to increase the stiffness of the fibers by forming crosslinks in the polymer. In the future, similar testing will be conducted in a Phosphate Buffered Saline solution at 37 degrees Celsius to mimic the physiological environment of the human body.

Candace Latnie
Michigan State University

Modeling and Analysis of Patient Specific Data of Pulmonary Arterial Hypertension

Pulmonary arterial hypertension (PAH) exists in various types and forms, all of which affect millions of individuals who endure its costly implications. Pulmonary hypertension is a disease caused by an elevated blood pressure in the lungs' arteries. Treating a cardiovascular dysfunction such as this, however, comes with difficulties because the effects of this disease on cardiac function are not fully understood. Through the use of three-dimensional modeling of the left and right ventricles of the heart, paired with the knowledge of the ventricle pressure and measured volume, ventricular pressure-volume relationships can be constructed. Along with the use of this pressure-volume relationship, Finite Element Analysis (FEA) is used to determine the deformation of the heart and identify any irregularities in the pulmonary hypertensive heart. The use of this technique will enable us to better understand this disease so that better treatment methods can be identified to treat patients affected by PAH.

Christina Jones
Wayne Community College District

Manganese (II) Determination at Select Sites on the Detroit River with the Use of Monochromic Indicators

The Detroit River, a largely industrialized natural border between the United States and Canada, is a precious natural resource. It requires frequent water monitoring to ensure that the fresh water source is both safe for consumption and recreational use. Several samples were collected from Belle Isle to conduct water quality testing and to determine the levels of select heavy metals, including manganese (II). Heavy exposure to manganese (II) can accumulate in the body over time and negatively impact the nervous system. For this reason, it is important to monitor manganese (II) levels in

MICHIGAN AGEP ALLIANCE FALL CONFERENCE

Kellogg Hotel & Conference Center
Michigan State University, East Lansing, Michigan
November 21, 2015

highly industrialized areas such as Detroit, MI where manganese (II) pollution is more likely to occur. A complexing agent was used to determine the presence of the metal using monochromic indicators and a spectrometer was used to find the absorption spectrum. This data could then be used to determine the concentration, in parts per million (ppm), of manganese (II) in the collected samples using Beer's Law, $A=kc$, and linear regression analysis. Testing concluded that the quality of the Detroit River at the sampled locations were well within guideline standards and manganese (II) levels were slightly higher than the EPA recommended .05 ppm.

Clayton Carter
Western Michigan University

Atherosclerosis

Atherosclerosis is commonly referred to as the hardening or narrowing of arteries due to plaque formation. Given enough time, atherosclerosis can lead to heart disease, heart attack, or stroke. This process is caused by blood becoming saturated with LDL cholesterol, some will begin to diffuse into the endothelial cell lining of arteries. Once within this cell lining, oxidation occurs in the phospholipid lining of cholesterol, starting a chain reaction leading to plaque formation. It has already been observed that PEIPC is the most active phospholipid, so many of our tests centers around its use. One objective in our studies is to develop a practice in order to obtain a purified PEIPC concentration for more accurate testing, through the use of mass spectrometry. Furthermore, we are investigating the exact proteins involved in the process leading to endothelial cell stimulation. Our results have begun to yield a more pure PEIPC, due to the use of several different purification columns. Further studies to be conducted include testing to see if the individual sizes of the cholesterol particles impact diffusion, continued efforts to purify PEIPC, and retesting to confirm the roles of the identified proteins.

Erica Leonardi
Wayne State University

Electrospinning Growth Factor Releasing Microspheres Into Fibrous Scaffolds

Nerve regeneration has been an ongoing challenge in the field of science. Because of the complexity of the brain and spinal cord, little spontaneous regeneration occurs, and repair or healing are almost always partial at best. The main objective for this project is to generate a multifaceted environment that supports nerve growth and repair. Using the Electrospinning process, microspheres and support material are combined and spun into fibrous scaffolds. The microspheres contain NGF (Nerve Growth Factor) and it promotes and directs nerve cell growth. It is important to measure and analyze the many different characteristics of the scaffold before and after the chick dorsal root ganglia neurons are placed onto it: the alignment of the fibers, the fiber diameter, the porosity, and the degradation. Florescence and microscopic images are used to observe neurite growth and direction on the scaffold compared to the controls. Once pictures are taken, ImageJ is used analyze and enhance the images: the alignment and fiber diameter are measured and recorded, and the porosity, swelling and degradation are calculated.

MICHIGAN AGEP ALLIANCE FALL CONFERENCE

Kellogg Hotel & Conference Center
Michigan State University, East Lansing, Michigan
November 21, 2015

Hamad Mirza
Wayne State University

Polyamidoamine Dendrimer-TPP as a Platform to Deliver siRNA for Lung Cancer

Lung cancer is the second most common cancer in both men and women. Specifically, lung cancer accounts for one third of men and one fourth of women that expire from all types of cancer. RNAi, a post-transcriptional gene silencing mechanism, is a reliable tool in the treatment of many pulmonary disorders including lung cancer, due to its specific gene targeting ability. The development of efficient RNAi technologies has been hindered, however, due to the lack of nanocarriers that can effectively deliver short interfering RNA (siRNA) intracellularly. Poly (amidoamine) (PAMAM) dendrimer has been recognized as one of the most promising gene carrier as PAMAM is monodisperse and has multivalent surface group for siRNA binding. Additionally, triphenylphosphonium (TPP), a small delocalized cation, has been known to accumulate in the mitochondria due to its negative charge. In this work, we investigate the gene knockdown ability of siRNA complexed with generation 4 amine terminated PAMAM dendrimer (G4NH₂ PAMAM) modified with TPP, as a function of N/P ratio (5, 10, 20, 30) and TPP density (0, 4, 8, 12) within eGFP expressing lung alveolar epithelial (A549) cells. The complex of siRNA and G4NH₂ PAMAM- TPP, named dendriplex, is studied for size and potential using Light Scattering methods, complexation efficiency using gel electrophoresis and the cytotoxicity using a MTT assay. We discover that the G4NH₂-12TPP/ siRNA complex at N/P ratio 30 represents the highest in vitro gene knockdown of all groups. This work demonstrates the potential benefits of utilizing TPP-conjugated dendrimers in the formation of dendriplexes.

Ida Fonkoue
Michigan Technological University

Acute alcohol consumption modulates sympathetic vascular transduction differently in Caucasians and African Americans

Recent studies consistently report that alcohol consumption increases muscle sympathetic nerve activity (MSNA) in humans. Despite the increased prevalence of hypertension and alcohol consumption in African Americans (AA), no studies have compared MSNA responses to acute alcohol consumption in AA and Caucasians (C). We hypothesized that acute alcohol consumption would increase MSNA in both AA and C, but that sympathoexcitatory responses would be augmented in AA. Five minutes of supine heart rate (HR), blood pressure, MSNA, and forearm blood flow were recorded in 108 AA (age, 243±1 yrs) and 118 C (age, 232±1 yrs) before and 45 min after consumption of 2.5ml of vodka per kg body mass. Increases in blood alcohol content were greater in AA (0.99105%) compared to C (0.087%; P<0.05). Acute alcohol elicited similar increases of HR in AA (612±45 to 6970±34 beats/min; p<0.001) and C (612±45 to 678±45 beats/min; p<0.001). Contrary to our initial hypothesis, acute alcohol consumption tended to increased MSNA in C (164±3 to 287±5 bursts/100 heart beats; P=0.14<0.05), but did not alter MSNA more than in AA (268±7.6 to 29±56 bursts/100 heart beats). Forearm vascular conductance (FVC) was not altered by alcohol consumption in AA or C. However, when sympathetic vascular transduction was calculated (i.e., FVC/MSNA), a significant racial difference was observed (time×race, p=.02717). Specifically, sympathetic vascular transduction was reduced in C (2.4±0.4 to 1.1±0.12 units; p<0.01), but did not change in AA (1.43±0.34 to 1.3±0.34 units). These findings suggest acute alcohol consumption influences MSNA-vascular coupling differently in AA and C, but it is unclear if the rate of alcohol metabolism is contributing to this difference.

MICHIGAN AGEP ALLIANCE FALL CONFERENCE

Kellogg Hotel & Conference Center
Michigan State University, East Lansing, Michigan
November 21, 2015

Jabed Khan

Wayne Community College District

Levels of Nickel (II) and Copper Ion in Selected Sites of the Detroit River Using Linear Regression and Monochromic Indicator

Layer-by-layer (LBL) films containing synthetic and bioactive molecules such as DNA are promising biomaterials for controlled and localized gene delivery for a number of biomedical applications including cancer DNA vaccine delivery. Gene delivery applications require that LBL films disassemble in physiological conditions. This research focuses on the synthesis and engineering of bio-reducible poly (amido amines) and non-bio-reducible poly (ethylenimine) as gene delivery vectors. This research also describes a method to deposited DNA into two different LBL films. One is fabricated by bio-reducible poly (amido amine) (pAPOL) which contain disulfide bond, and the non-bio-reducible one is using well-know polycation gene carrier poly(ethylenimine) (PEI). LBL film self-assembly is based on the electrostatic force between polycation and DNA. All the film fabrications are alternatively dipping substrate into polycation and DNA solution. Based on the electrostatic force, the LBL film can be built in layer structure with order. The LBL films containing pAPOL with disulfide bond is high redox sensibility which can be broken down by thiol group like glutathione. The concentration of glutathione in our human body is much higher in intracellular fluid and tumor cells rather than extracellular milieu and normal cells. It's makes this film can be degraded in specific physiological condition and released DNA on purpose to achieve target therapy, But since PEI is non-bio-degradable polymer which making this LBL film much stable in human body. We will immerse these two kinds of films in dithiothreitol (DTT) to perform LBL disassembly property. Films assembly and disassembly will be characterized with atomic force microscopy (AFM). It's describing a simple method of LBL assembly and disassembly in gene delivery system.

Jacob Jurss

Michigan State University

Indigenous Borderlands: Importance of Environmental Resources to Indigenous Power in the western Great Lakes

My research examines the intersection of power and the environment in the early nineteenth century western Great Lakes. In 1825 the American government hosted a treaty conference to establish boundary lines between the Native American nations living in the region. However, the Americans failed to recognize the landscape for what it was, an Indigenous Borderland where power and authority were based on the ability of leaders to use their access through kinship ties to environmental resources to provide for the greater community. This was a bountiful region filled with natural resources that sustained life for the people. However, there were areas like maple sugar trees grooves, wild rice ponds, and hunting territory that were more prized then others because of their ability to sustain large numbers of people. The overlapping claims to such areas created the Indigenous Borderlands. This is clearly seen at the wild rice and maple tree grooves surrounding the Leech Lake and Mille Lacs region fought over by western Ojibwe and eastern Dakota. During the late 1790s villages at these lakes were Dakota strongholds. As the Ojibwe moved west the authority over these village sites came into contention. By 1825 Ojibwe leaders at the Prairie du Chien council used the treaty to solidify their claims at Mille Lacs and Leech Lake setting up the expansion of their communities at Gull Lake and areas further west. My research explores how these Indigenous Borderlands operated.

MICHIGAN AGEP ALLIANCE FALL CONFERENCE

Kellogg Hotel & Conference Center
Michigan State University, East Lansing, Michigan
November 21, 2015

Jason Meichtry
Western Michigan University

Knockdown of Candidate Proteins to Investigate the Role of Each Protein in the Regulation of OxPAPC in Endothelial Cells

The buildup of plaque in arteries is known as atherosclerosis which can eventually lead to cardiovascular disease (CVD). This disease is the leading cause of mortality in the U.S. with around 700 million CVD-related deaths last year. Oxidized lipids, specifically oxidation products of 1-palmitoyl-2-arachidonoyl-sn-glycerol-3-phosphatidylcholine (PAPC), are the main active components of oxidized LDL that stimulate endothelial cells that line the artery which induce monocyte binding and atherosclerosis. It has previously been determined that OxPAPC treatment affects several pathways in endothelial cells, including the oxidative stress and inflammatory pathways, but the exact mechanism was unknown. We determined with siRNA transfection studies that certain proteins affect OxPAPC regulation of genes in endothelial cells. I utilized methods such as western blotting, mass spectrometry, solid phase extraction, phosphorus assay, polymerase chain reaction (PCR) and tissue cultures during the experimentation of these proteins.

Lastasia Woods
Wayne Community College District

Levels of Nickel (II) and Copper Ion in Selected Sites of the Detroit River Using Linear Regression and Monochromic Indicator

The purpose of this investigation is to determine the appropriate Nickel (II) and Copper levels in freshwater quality obtain from Detroit River. The Detroit River and Belle Isle Park are the questionable location samples were taken from four surrounding areas. North plus South fishing pier, the Beach as well as the Detroit Yacht Club. According to the EPA Water Quality Act appropriate levels of Nickel II concentration limit is 0.1 ppm and Copper concentration level limit is 1.3 ppm, water quality was ascertained by testing pH. It is important to check levels of Nickel II and Copper due to corrosive water which can cause metals in pipes to leach on to tap water pH levels greatly affect this. Metal ions solutions in most cases are detected in some environmental water, high levels are considered toxic to the Environmental Protection Agency (EPA) due to potential environmental and health risk. Spectrophotometer technique was utilized for Nickel (II) and Copper ion maximum wavelength Nickel II 398 and Copper 656. Methodology stock solution, concentration and dilution, Beers Law, Henderson Hasslebalch plus linear regression developed.

MICHIGAN AGEP ALLIANCE FALL CONFERENCE

Kellogg Hotel & Conference Center
Michigan State University, East Lansing, Michigan
November 21, 2015

Mahlet Gardew
Michigan State University

Lignin to Liquid Fuels and Value-added Products using Thermochemical Conversion and Electrocatalytic Upgrading

Biomass fast pyrolysis (BFP), which uses heat (400-600C) in the absence of oxygen to convert biomass to bio-oil, biochar and combustible gas, offers an alternative to fossil fuels and a means to alleviate the environmental impact of burning fossil fuels for energy production. The major product, bio-oil, can be further upgraded to liquid hydrocarbon fuels, while biochar can serve as a solid fuel or soil amendment. The combustible gas co-product is typically burned for needed process heat. However, the most valuable of the pyrolysis products, bio-oil is highly oxygenated, corrosive, low in energy content and unstable during storage due to the hundreds of compounds that make up bio-oil. As a means of improving bio-oil properties, electrocatalytic hydrogenation (ECH) is employed to reduce these reactive compounds. This study particularly focuses on the electrocatalytic stabilization of compounds derived from the pyrolysis of lignin. As lignin is a component of biomass comprising up to 30% of the mass and 40% of the energy stored in biomass it offers great potential as a BFP feedstock. Lignin model compounds representative of bio-oil components were subjected to ECH under mild conditions using ruthenium on activated carbon (Ru/ACC) catalyst. To date, several model monomers have been reduced to simpler compounds, which have better heating values when compared to the starting substrates. The coupling of pyrolysis and electrocatalysis for depolymerization and upgrading of lignins, that are byproduct of the cellulosic ethanol conversion processes, will enable maximization of yields from biomass conversion to fuels and value added products.

Mia Jawor
Western Michigan University

A Green-efficient Protection Method for Specific Functional Groups

This project addresses the need for environmentally-friendly organic synthesis processes, by eliminating solvents, toxic/explosive reagents, purification steps, maximizing conversion/yield and minimizing waste production. Specifically, we propose a novel functional group protection method for heterocyclic amino, hydroxyl, thiol groups. This method is valuable for organic synthesis both at the laboratory and the industrial scales. Based on our preliminary results with pyrazole, we propose to extend the novel, green protection method discovered in our lab to a variety of substrates, including other heterocyclic amines, as well as hydroxyl- and thiol functionalized compounds. To this end, we: 1) investigate the feasibility of the protection method and optimize the reaction conditions for a number of different substrates, 2) test the hypothesis that the acidity of the substrate proton, which will be replaced by the protecting group, is directly correlated with the efficiency (conversion, reaction temperature, and time) of the process, and 3) test the hypothesis that heterocyclic amines can be selectively protected in the presence of primary amino (NH₂) substituents.

MICHIGAN AGEP ALLIANCE FALL CONFERENCE

Kellogg Hotel & Conference Center
Michigan State University, East Lansing, Michigan
November 21, 2015

Natalie Nevarez
University of Michigan

DA Neurochemistry of Pair Bonding

The monogamous prairie vole serves as an ethologically sound model to study social attachments as it forms lifelong pair bonds. Previous work has shown that dopamine (DA) signaling within a part of the brain called the nucleus accumbens shell is important for the development and maintenance of pair bonds. Interestingly, this is the same region that is hijacked by drugs of abuse. Indeed, when voles develop a drug dependency they cannot form pair bonds and vice versa- pair bonding is protective against the rewarding effects of addictive drugs. In the past we have used sub second DA recordings in brain slices to show that DA release is increased in pair bonded animals and that, in males, this increase is dependent on the fertility of the pair. Our current work shows that the observed enhancement is a result of decreased autoregulation within the DA system. Finally, we are investigating peptides that may modulate DA release within these areas to promote pair bonding. Our data show that mu-opioid receptor activation can modulate presynaptic DA release whereas oxytocin (OT) treatment shows only a mild effect. To determine whether OT is modulating DA release via another mechanism we are measuring real-time cocaine induced DA release in OT treated rats. Preliminary data show that OT treatment reduces cocaine induced DA release. This work provides valuable insights to our understanding of pair bonding and drug addiction and evidence for the benefits of social support for drug addicts.

Romana Chowdhury
Wayne Community College District

Doxorubicin

An optimized, pH-sensitive mixed-micelle system conjugated with folic acid is prepared in order to challenge multidrug resistance (MDR) in cancers. The micelles are composed of poly(histidine (His)-co-phenylalanine (Phe))-b-poly(ethylene glycol) (PEG) and poly(L-lactic acid) (PLLA)-bPEG-folate. Core-forming, pH-sensitive hydrophobic blocks of poly(His-co-Phe) of varying composition are synthesized. DOX-loaded m-PHSM(20%) was prepared using a dialysis method. The m-PHSM(20%) was composed of poly(His-co-Phe (16 mol%))-b-PEG (80 wt%)/PLLA-b-PEG with a folate moiety at the end of the PEG (20 wt%) (denoted as DOX/m-PHSM(20%)-f) or without folate (denoted as DOX/m-PHSM(20%)). The drug-loading efficacy was 85% and the drug-loading content in the micelles was 20%.

MICHIGAN AGEP ALLIANCE FALL CONFERENCE

Kellogg Hotel & Conference Center
Michigan State University, East Lansing, Michigan
November 21, 2015

Rosa Jaiman
Michigan State University

Comparative Effects of MeHg on Glutamate Levels of Cerebellar and Cortical Astrocytes

Methylmercury (MeHg) is a neurotoxicant that targets granule cells in the cerebellum. MeHg increases the internal calcium concentration in granule cells, which induces an increase in glutamate release and eventually cytotoxicity. Astrocytes can buffer glutamate from the extracellular environment and prevent excitotoxic cell damage. Despite the fact that MeHg primarily affects granule cells, astrocytes are also targets of this metal. MeHg-induced neurotoxicity in astrocytes has been studied in the cortical layer. However, effects on cerebellar astrocytes are less studied, and regional differences can occur in astrocytes between the two areas. The goal of this study was to compare levels of glutamate in the media of cerebellar and cortical astrocytes after an acute MeHg exposure. Determining the levels of glutamate in the media would allow us to know if MeHg induces release or decrease in absorption of glutamate in astrocytes. Primary astrocyte cultures from the cerebellum and cortical forebrain layer were obtained from 7-8 day old mice. At 13-15 DIV, cells were exposed for 3h to 0 μ M, 1 μ M, 2 μ M, or 5 μ M MeHg. Levels of glutamate in the media were measured 24h later, using a colorimetric assay. There was a significant decrease in glutamate absorption at 5 μ M MeHg in cortical astrocytes. However, there was a significant decrease in glutamate absorption at 1 μ M and 2 μ M MeHg and an absolute glutamate release at 5 μ M MeHg in cerebellar astrocytes. The effects of MeHg exposure in glutamate levels observed on cerebellar astrocytes might contribute to the sensitivity of the granule cells to MeHg.

Riana Manabat
Wayne State University

Design and Development of Lab Apparatus & Calibration for Pressure Transducer for Measurements of Jet Fuel Force on a Control Surface

When determining fuel economy and emissions of a diesel engine it is important to understand the injection process, through determining the fuel flow rate. Modeling and simulation of the injection process of a diesel engine allows for accurate design to meet fuel economy and emission targets. One of the parameters for obtaining the fuel flow rate is by measuring the pressure of fuel out of an injector. To determine the pressure of the diesel fuel, the force of the jet fuel is measured on a control surface. An apparatus was designed to hold a pressure transducer, a Piezotronics high frequency pressure sensor, PCB113B26. This pressure transducer must be positioned directly perpendicular to the fuel stream, allowing for precise measurement. Following, calibration of the transducer is necessary before accurate measurements of the force of the fuel spray can be taken. Positioning the PCB113 transducer orthogonal to the jet fuel spray is done by designing an apparatus that can accurately move the pressure transducer laterally, rotationally and angularly. Three components were procured, to move and to position the transducer in the three dimensions, making the transducer orthogonal to the spray. Design and manufacturing of adapters and connecting pieces were developed to assemble a single apparatus with the three components. Before accurate measurements of the jet fuel can be taken, calibration needs to take place. The purpose of instrument calibration is to remove or reduce bias in the readings from the transducer and surroundings. The PCB113 transducer is a dynamic transducer and a signal conditioner to remove noise in the readings, and a deadweight tester was used for calibration. An adapter was designed and developed to place the transducer in the deadweight tester. Measurements from the deadweight tester were then taken through the signal conditional from an oscilloscope.

MICHIGAN AGEP ALLIANCE FALL CONFERENCE

Kellogg Hotel & Conference Center
Michigan State University, East Lansing, Michigan
November 21, 2015

S. Gisela Leija
Michigan State University

Unveiling Sexual Identity in the Face of Marianismo

Marianismo illustrates a gender role phenomenon common in Latina women, which implicitly socializes embodiment of virtues of the Virgin Mary, including caretaking, self-sacrifice, honor, passivity, and sexual morality. The authors suggest that problems may arise regarding sexual satisfaction, as sexual pleasure may conflict with the expectation of sexual morality. Integration of transgenerational and narrative therapies to facilitate sexual exploration throughout the acculturation process are proposed. Suggestions on facilitation of sexual exploration for Latinas experiencing conflict with contradicting cultural attitudes about their sexuality are discussed.

Silvia Villaneueva
Michigan State University

Effect of Different Laying Hen Strains on Egg Pecking and Daily Egg Laying Patterns

Selection of specific production traits in animal husbandry has been heavily influenced by demand in the last century, therefore optimization of space and proper usage of facility resources are goals to be achieved in commercial facilities. This study examined the relationship between the use of nest boxes per time of day to each specific hen strain (Bovan Brown, DeKalb White, Hyline Brown, and HyLine W36) in an aviary system. This experiment also developed an angle towards determining whether higher rates of hens within the designated laying areas contribute to higher egg pecking ratios. Eggs and birds were tracked and accounted for in three 4 hour bouts (morning, midday, and evening). Pecked eggs were counted towards the total number of eggs produced, then recorded in a separate category to calculate the ratio from each production total per day to determine the correlation (if any) to each strain. The average total morning nest box occupancy was higher in the Bovan Brown and HyLine Brown strains compared to that of either white strain. Hyline Brown and Bovan Brown exhibited a peak laying optimum in the morning period whereas DeKalb White and W36 hens had a lower morning lay rate and continued to lay during midday. All four strains were similar in their evening laying percentages. Pecked egg percentages were higher in the brown strains than in the white strains in all three time periods and were correlated to high nest box occupancy and high system egg lay.

Souful Bhatia
Michigan State University

Electroactivated Carbon-hydrogen Activation to Develop Deuterated Compound

This work entails a mild and general procedure for the activation of carbon-hydrogen sites in alcohol and amines in a regioselective and stereoretentive manner. We have developed an electrocatalytic setup that effects hydrogen replacement by deuterium in amines, alcohols and chiral compounds such as amino acids with >95% deuteration and enantiomeric excess of >99%. Due to the significance of deuterated compounds as therapeutic agents, internal standards and investigative tools to understand reaction mechanisms, this methodology is a significant step in developing mild, regioselective and stereoretentive heterogeneous-based catalytic system. This concept has also been extended to make carbon-nitrogen bonds in the presence of amines as nucleophiles and alcohols as alkylating agents to construct alkylamines. Alkylamines that are significant as building blocks for surfactants, pharmaceutical drugs, gas

MICHIGAN AGEP ALLIANCE FALL CONFERENCE

Kellogg Hotel & Conference Center
Michigan State University, East Lansing, Michigan
November 21, 2015

scrubbers etc. are currently made using potent alkylating agents such as alkyl halides or sulfonates. Compared to our reaction that takes place under mild heating and at atmospheric pressure in a mix of water and the alcohol catalyzed by a heterogeneous, robust electroactivated catalyst, such reagents are vulnerable to overalkylation, thereby making them less selective and atom economical.

Taeyeon Kim
Michigan State University

Does School Type Matter?: School Effects of Autonomous Public High Schools

In 2009, the Korean government introduced policy regarding autonomous public high schools, which were established to enforce public schools to have accountability and autonomy, as a future model of public high schools. Key goals included diversifying school curricula, focusing humanistic and career education, and improving academic achievements. Though Korean citizens have questioned whether autonomous high schools can improve students' development in public schooling, researchers have overlooked the effectiveness of these schools, examining the operational conditions and improvement plans of the policy.

The purpose of this study was to examine the effects of autonomous public high schools on student learning and development of students' social skills, while excluding the effects of student selection into these schools. Using sophisticated modeling for two-year panel data from 2010 to 2011 collected by the Seoul Educational Longitudinal Study (SELS) to analyze the student and school traits of both autonomous and normal public high schools, I estimated the effectiveness of autonomous schools on learning and social development.

Importantly, the only significant effect found for autonomous public high schools was a negative effect on students' math scores. No effects were found for reading scores, English scores, school satisfaction, creativity, and career maturity. Additionally, the core factors like curriculum autonomy and career education did not have a significant effect. These results suggest that the effects of autonomous public high schools should be re-considered in aiming for the improvement of Korean schooling.

Tatyona Fields
Michigan State University

Improving Solar to Electrical Energy by Studying j-Aggregates

The goal of this research project is to improve solar to electrical energy conversion. The efficiency of this process depends on how efficiently energy that is captured as photons is converted into charge separation or electrons. We will investigate J-aggregates of indocyanine green (ICG). J-aggregates are self-assembled stacks of molecules that mimics photosynthetic stacks of molecules in plants, and mimics semiconductor solar energy cells. A pair of laser pulses will be used to measure the dephasing time. In order to do this a map need to be obtain of dephasing times and then use an electron microscope to learn which structures have longer dephasing times, which correlate with more efficient energy conversion. The information learned can then be communicated to scientists and engineers designing solar cells.

MICHIGAN AGEP ALLIANCE FALL CONFERENCE

Kellogg Hotel & Conference Center
Michigan State University, East Lansing, Michigan
November 21, 2015

Victoria Bankowski
Wayne Community College District

Fresh Water Analysis of Detroit's Belle Isle Fishing Site NaCl Assist in Quality Control of The Detroit River

The Detroit River is one of the most demanding waterways around the world. It is vital that the levels of microbes are within the safe range (Blaster). The focus of this study is to determine if the levels of bacterium found in Detroit's Belle Isle's Fishing Zone are below the guidelines set by the Environmental Protection Agency. Microbial contaminates can arise from algae, bacteria, sewage and can occur in both animals and humans. The research focus on Staphylococcus aureus in this area, determined colony counts could have a higher numbers; due to activities in this area; (fishermen, can be seen with their hands in mouths, prepping fishing line, can also be seen spitting, and have hands in the water), are possibility's for an unsafe number of the organisms found within the water. This research will determine if pH, Na Cl levels, weather, and river depth play an important role in assuring the rivers normal flora is within a safe range.

William Davie
Michigan State University

Water Infiltration Rates Across Roping Systems and Plant Communities

Water from rainfall or irrigation must first enter the soil for it to be used by plant roots and microbes. The speed at which water enters the soil is the infiltration rate. With low infiltration rates, the soil may be more prone to erosion. As soil erosion occurs, productive topsoil is lost to waterways, simultaneously leaving less nutrients for crop production and depleting water quality. Infiltration rates may also influence leaching, which is the loss of nutrients through rain or irrigation. This is a concern when it contaminates groundwater and effects public health. For example, nitrate leaching can cause Methemoglobinemia, a kind of "Blue Baby Syndrome".

My research project compares infiltration rates across cropping systems and plant communities of the KBS Long Term Ecological Research site. We predicted that more intensively managed systems would have lower infiltration rates. I measured infiltration rates by using a single-ring infiltrometer with a Mariotte-syphon. We the highest rates of infiltration were in unmanned forest sites while the lowest were in highly managed cropping systems. Further study of how infiltration rates affect microbial activity, and how seasonal dynamics, crop rotations, rainfall variability, along with how topography affect infiltration would be valuable. These findings may motivate farmers and decision makers to alter their practices.

Yashashree Majalika
Wayne State University

Optimal Stiffness of MeHA Hydrogels

The most common prognosis for nerve damage currently is autografting. It provides the best outcome with the current technology but almost never returns full functionality to the nerve. The development of a biomaterial that will wrap around the edges of the two severed ends and pull them together and enhance neuron growth would allow for the nerve damage to be fully repaired. The study is done by testing hydrogels of different stiffnesses and mae with different concentrations of Methacrylated Hyaluronic Acid (MeHA), a naturally occurring substance in the body. Fibroblasts extracted from chick embryos were planted on the hydroogels and allowed to proliferate. The final elongation ratio and cell count was measured to determine that the hydrogel with 3% concentration of low modification MeHA was preferred for cell growth.

MICHIGAN AGEP ALLIANCE FALL CONFERENCE

Kellogg Hotel & Conference Center
Michigan State University, East Lansing, Michigan
November 21, 2015

CONFERENCE NOTES

MICHIGAN AGEP ALLIANCE FALL CONFERENCE

Kellogg Hotel & Conference Center
Michigan State University, East Lansing, Michigan
November 21, 2015

WHAT IS MICHIGAN AGEP ALLIANCE (MAA)?



The Michigan Alliance for Graduate Education and the Professoriate (AGEP) seeks to join together universities and colleges in the common mission of increasing the number of underrepresented minority students earning PhDs and positioning minority students to become leaders in the social, behavioral, and economic sciences fields (SBE), science, technology, engineering and mathematics (STEM) fields.

Each AGEP alliance employs creative administrative strategies, develops infrastructure, and engages in substantive partnerships with non-doctoral granting institutions (many minority-serving institutions to enhance recruitment, retention, and advancement).

Five major research universities in this alliance include the graduate schools at the University of Michigan, Michigan State University, Michigan Technological University, Wayne State University, and Western Michigan University.

For more information, visit us at:

MAA website: www.michagep.org

MSU AGEP website: www.grad.msu.edu/agep

Michigan AGEP Fall Conference website: www.grad.msu.edu/agep/conference.aspx

Michigan AGEP Fall Conference Planner: Steven Thomas, deshawn@grd.msu.edu

This material is based upon work supported by the National Science Foundation under The Michigan AGEP Alliance for Transformation (MAA): Mentoring and Community Building to Accelerate Successful Progression into the Professoriate # 1305819. Any opinions, findings, and conclusions or recommendations expressed in this material are those of The Graduate School at MSU and do not necessarily reflect the views of the National Science Foundation.