



GRADUATE STUDENT ASSOCIATION

THE UNIVERSITY OF TOLEDO

7th Annual

MGRS

Midwest Graduate
Research Symposium

APRIL 9TH, 2016





Patricia R. Komuniecki, Ph.D.

As Vice Provost for Graduate Affairs and Dean of the College of Graduate Studies, it is my great pleasure to welcome all of you to The University of Toledo (UT) for the 7th Annual Midwest Graduate Student Research Symposium. We are delighted that you have chosen to participate in what has become an exciting annual tradition. UT places great importance on quality graduate and professional programs. We have about 4,300 graduate students in our 128 Master's programs and 40 Doctoral Programs in 13 colleges spanning two campuses.

Today, you will be making your oral and poster presentations on the Main Campus, but we also have a Health Science Campus-the home to our healthcare graduate programs-just 3 miles to the south. We are expecting about 175 presenters, including participants from 20 other Midwest universities. The presentations range from projects in biomedical and environmental sciences to engineering, humanities and the social sciences.

The UT Graduate Student Association (GSA), under the dynamic leadership team of President Eric Prichard and Vice President Robert Gabriel III, has been working hard for months to make this day successful. It is a wonderful opportunity for graduate students from around the region to share their research and meet potential collaborators.

President Gaber, Provost Barrett and the UT faculty all join me in wishing you an exciting day of research on our campus. We hope that you all enjoy the day, the presentations, the meals and the company. The College of Graduate Studies is proud to support this endeavor and wishes all the participants the warmest of welcomes to The University of Toledo.

Sincerely,

Dean Komuniecki

April 9, 2016



Eric Prichard, President of Graduate Student Association

Although this is only the seventh year the University of Toledo's Graduate Student Association has hosted the Midwest Graduate Research Symposium, I cannot help but feel a thrill when I consider the long standing tradition of scholars meeting to engage in academic discourse. When researchers gather from across many universities and disciplines to discuss ideas, one can almost hear the echoes of The Academy, Alexandria, Al-Nizamiyya, and Abelard's Paris. Open academic discourse has fueled the flames of progress through humanity's darkest hours. It has given rise to innovation and it has inspired. Above all, open discourse is fun. It is fun to socialize with people who have a passion for research and to learn from fellow scholars. So I invite you to enjoy this day. Enjoy participating in one of the greatest human traditions. An academic meeting is a time to celebrate the hard won progress we have each added, in our small ways, to the relentless pursuit of knowledge. The workbench. The archive. The field. The classroom. These are places where we toil. Here is where we come together to celebrate as a community of learners in a spirit of collegiality and curiosity.

Welcome to the 7th Annual Midwest Graduate Research Symposium!

Sincerely,

Eric Prichard, M.A, PhD Graduand,
President of the University of Toledo Graduate Student Association

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INVITED UNIVERSITIES

Akron University	Otterbein University
Alderson-Broadus College	Pennsylvania College of Art and Design
Ashland University	Purdue University
Ball State University	Rose Hulman IT University
Bowling Green State University	Shawnee State University
Carnegie Mellon University	St. Francis University
Case Western Reserve University	Syracuse University
Central Michigan University	Tennessee State University
Cleveland State University	Tiffin University
Columbia University	University of Charleston
Cornell University	University of Cincinnati
Duke University	University of Dayton
Eastern Michigan University	University of Detroit Mercy
George Mason University	University of Evansville
George Mason University	University of Findlay
George Washington University	University of Indianapolis
Grand Valley State University	University of Kentucky
Indiana Purdue Fort Wayne	University of Louisville
Indiana State University	University of Michigan
Indiana University	University of Notre Dame
Indiana Wesleyan University	University of Pittsburgh
IUPUI	University of South Carolina
James Madison University	University of Tennessee
Kent State University	University of Toledo
Lourdes University	University of Virginia
Marietta College	Walsh University
Miami of Ohio University	Western Michigan University
Michigan State University	Wright State University
Mount Union University	Wayne State
North Carolina State University	Xavier University
Oakland University	Youngstown State University
Ohio Northern University	
Ohio State University	
Ohio University	

KEYNOTE SPEAKER



Ronald Delph, Ph.D.

Professor at Eastern Michigan University

Dr. Ronald Delph is an expert on the history of Renaissance Italy. He did his undergraduate work at Western Michigan University and received his PhD from the University of Michigan. He is professor of history at Eastern Michigan University. He teaches courses on Europe in the Middle Ages, and on European culture and society in the Renaissance and Reformation eras. His specialty is Renaissance Italy, and he frequently teaches his course, "Power, Place and Image in Florence and Rome," in these two lovely Italian cities over winter break, accompanied by Eastern students.

His articles appear in the *Encyclopedia of World History*, and the *Encyclopedia of the Reformation*. Book reviews appear in *Erasmus of Rotterdam Society Yearbook*, *Catholic Historical Review*, and *Sixteenth Century Journal*.

MAJOR SPONSORS

The Graduate Student association would like to thank the sponsors of the 7th Annual Midwest Graduate Research Symposium.

Without their help and generosity, this symposium would not be possible.



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THE SCIENTIFIC RESEARCH SOCIETY

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7th Annual Midwest Graduate Research Symposium Schedule

8:00-9:00 AM Registration and Light Breakfast (Field House Atrium) Hang posters in the Student Union Room (2582 /2584)

9:00-9:30 AM Welcome and Introduction - President, Graduate Student Association: Aaron Shaw (Field House Auditorium Room 2100)
 Introduction of the Dean, College of Graduate Studies - President, Graduate Student Association: Aaron Shaw
 Opening Remarks - Dean, College of Graduate Studies: Dr. Patricia Komuniecki
 Description of Symposium Format - Vice President, Graduate Student Association: Robert Gabriel III

	Room 2200	Room 2210	Room 2220	Room 2230	Room 2240	Room 2250	Room 2260	Room 2270	Room 1230
Oral Presentations I	Session I	Session II	Session III	Session IV	Session V	Session VI	Session VII	Session VIII	Session IX
	Ethnic and Cultural Studies	Renewable Energy	Social Health Issues / Oncology	Education / Astronomy	Our Water	Materials and Polymer Science	Medical Treatments	Physiology	Climate Change, Hydrology, Engineering for Weather
9:45-10:05	John Frye	Ruwani Wasalathanthri	Biniyam Yemane	Pearl Mohankumar	Jessica Sherman	Yeakub Zaker	Cassandra Gohn	Hai Nguyen	Eric Moore
10:05-10:25	Damian Peoples	Yaser Shirazi	Erin Vogel	Talal Alasmari	Delilah Clement	Natalia Razgoniaeva	Tripti Thapa Gupta	Zahra Assar	Deepesh Bista
10:25-10:45	Malek Abduljaber	Geethika Liyange	Anna Martinez	Monica Hatfield Price	Martin Simonson	Badri Bhattarai	Hamideh Keshavarz	Nikita Deshpande	Mitchell Dziekan
10:45-11:05	Kamal Belmihoub	Suneth Watthage	Jeanette Eckert	Mike Mathis	Casey Yanos	Aydar Atmagulov	John Imbery	Alyssa Lesko	Audrey Maran
11:05-11:25	Mariana Naddaf	Ilke Celik	Kristen Coleman	Joseph Booker	Megan Niner	Janani K. R. Manchala	Vinay Mutthamsetty	Qinzhe Wang	Ahmed Abdelaal
11:25-11:45	Amin Etemadifar		Nikhil Dhinagar	Jennifer Greco		Jennifer Gadiant	Yuhang Cai	Maisha Rashid	

7th Annual Midwest Graduate Research Symposium Schedule

Begins 11:45 AM

Lunch (Field House Atrium)

Professional Development Seminar - Moderator: Alissa Anderson (Field House Auditorium Room 2100)

Panelists: Dr. Tomer Avidor-Reiss, Dr. Gale Mentzer, Ryan Duckett and Linda Koss

12:00-1:00 PM

Discussion Topic- Writing a Successful Grant

	Room 2200	Room 2210	Room 2220	Room 2230	Room 2240	Room 2250	Room 2260	Room 2270	Room 1230
Oral Presentations II	Session X	Session XI	Session XII	Session XIII	Session XIV	Session XV	Session XVI	Session XVII	Session XVIII
	Agriculture / Diet	Non-Human Biology / Human Antibodies	Oncology	Education	Bioinformatics / eDNA	Design / Literature	Psychology	Ecology	Public Policy / Security
1:10-1:30	Justin Burdine	Gopal Dahal	Gardiyawasam Kalpana	Vijay Paralkar	Tin Nguyen	Nadia Arafah	Fawn Caplandies	Amanda Winters	Lindsey Waller
1:30-1:50	Ariel Dodgson	Nisansala Muthunayake	Kaitlyn Dvorak	Lisa Lambert Snodgrass	Diana Diaz	Nicholas Hansford	Jinling Zhao	Caitlin Maloney	David Medved
1:50-2:10	Christian Scott	Adaeze Izuogu	Surya Karki	Erica Hollis	Kaveh Ahmadi	Gloria Diaz	Lindsay Roberts	Cari Ritzenhaler	Majed Rajab
2:10-2:30	Ashley Murray	Teresa Clark	Lichchavi Rajasinghe	Pamela Wilson	Taylor Monus	Lauren O'Connor	Yopina Pertiwi	Matthew Snyder	Wen Qu
2:30-2:50	Stephanie Nummer	Yongle Pang	Haneen Amawi	Collins Imoh	Breanna Caton	Gelareh Raoufi		Robby Baroudi	Fathi Amsaad
2:50-3:10	Edwina Kofi-Opata	Dulat Bekbolsynov	Jaime Stafford	Nathaniel Marshall				Brittani Furlong	Yassir Elrayah

7th Annual Midwest Graduate Research Symposium Schedule

3:00-4:25 PM

Session XVI: Poster Session (Student Union Rooms 2582/ 2584)

Keynote Speech and Awards Dinner (Student Union Ingman Room)

Introduction of Keynote Speaker - Josh Waldman, M.B.A., Ph.D

4:30-6:00 PM

Midwest Graduate Research Symposium Keynote Address

Ronald Delph , Ph.D

Professor at Eastern Michigan University

Awards Presentation



Oral Presentations

9:45 – 11:45 am & 1:10 – 3:10 pm

Memorial Field House

Abstracts are listed in alphabetical order using the first name of the presenter

1. Investigating the Antiviral Response to Tick-Borne Flaviviruses in the White-Footed Mouse

Adaeze Izuogu, Dr. Travis Taylor

Medical Microbiology and Immunology, The University of Toledo

Tick-borne flaviviruses (TBFV) greatly impact global health by causing encephalitis and hemorrhagic fevers. Despite severe disease in humans, TBFV infection of natural rodent hosts has little noticeable effect. The aim of the current study is to compare virus-specific responses in reservoir host cells and related susceptible species. Infection of primary fibroblasts from the white-footed mouse (*Peromyscus leucopus*, a representative host) with multiple TBFV showed up to a 10,000-fold reduction in viral titer compared to control *Mus musculus* cells. Step-wise comparison of the virus infection cycle revealed a significant block to viral RNA replication in the reservoir host. Furthermore, knockdown of key signaling genes led to significantly higher virus replication in *P. leucopus* cells suggesting that interferon signaling likely plays a role in viral restriction. Future studies will seek to identify the genetic determinants of restriction and we predict that findings from these studies will be useful in developing antiviral therapeutics.

Time- 1:50-2:10 pm, Location- Field House Auditorium Room 2210

2. Mitigating Icing Problem on Bridge Stays

Ahmed Abdelaal, Douglas Nims

Mecanical, Industrial and Manufacturing Engineering, University of Toledo

Atmospheric icing is a significant challenge that affects many structures such as power lines, bridges, telecommunication towers, and wind turbines in the countries located in cold areas. This study focused on icing problem on cable bridges. As icing events pose a potential threat to the traveling public and have a significant economic impact, a broad investigation was conducted in order to review all the identified anti/de-icing technologies which resulted in the selection of three technologies for testing, i.e. coating, chemicals, and internal heating. Experiments were conducted indoors at the University of Toledo (UT) icing tunnel and outdoors at UT icing station. None of the tested technologies were found to be appropriate for implementation. Therefore, administrative strategies were adopted which include the development of two new sensors and two models for ice accumulation and ice shedding from bridge cables to predict ice thickness and duration of the whole icing event.

Time- 11:05-11:25 am, Location- Field House Auditorium Room 1230

3. Adenomatous Polyposis Coli regulates Epithelial Membrane Protein 2 to mediate 3D morphogenesis and apical-basal polarity

Alyssa Lesko

Biological Sciences, University of Notre Dame

Adenomatous Polyposis Coli (APC) regulates several cellular processes including apical-basal polarity. We demonstrated that APC knockdown (APCKD) in Madin-Darby Canine Kidney (MDCK) cells altered morphogenesis, inverted polarity, and increased expression of epithelial membrane protein 2 (EMP2) in 3D culture. Interestingly, both the c-terminal fragment of APC and EMP2 knockdown in APCKD cells decreased cyst size and restored apical polarity. Therefore, we hypothesize that the APC c-terminus regulates EMP2 to mediate apical-basal polarity. The current study investigates two mechanisms of EMP2 regulation: transcriptional activation or direct interaction. EMP2 promoter screens identified 32 transcription factors binding sites including signal transducer and activator of transcription (STAT3). APCKD cells have increased STAT3 activation in luciferase reporter assays. Ongoing studies are focused on dissecting the mechanism(s) of EMP2 regulation through CHIP assays and biochemical analysis. Understanding how the interaction of APC and EMP2 influences apical-basal polarity will identify key players involved in APC-mediated disease progression.

Time- 10:45-11:05 am, Location- Field House Auditorium Room 2270

4. Direct and Indirect Effects of Predation and Warming on Herbivory and Ecosystem Processes

Amanda Winters, Shannon Pelini

Biological Sciences, Bowling Green State University

Global-average surface temperatures and climate variability are predicted to increase and there is the potential for a positive feedback between atmospheric carbon dioxide and warming. Our ability to make this determination is crippled by our lack of understanding of the conjoined effects of warming and organisms—both above- and belowground—on elements of the carbon cycle. Insect herbivores affect primary production and decomposition by altering plant chemistry and litterfall quantity and quality via their grazing activity and excretions. Predators impact herbivore abundance and activity, subsequently impacting elements of carbon cycling. Yet, the responses of herbivores and predators, and the plants and microbes with which they interact, to climatic changes will vary in magnitude and direction. Using experimental mesocosms, I will study the effects of three warming treatments on interactions between an arthropod predator, a lepidopteran larval herbivore, and aspen. I will also demonstrate how these trophic relationships affect decomposition and plant growth.

Time- 1:10-1:30 pm, Location- Field House Auditorium Room 2270

5. The Chaos Theory and the Middle East

Amin Etemadifar, Monita Mungo
Sociology, University of Toledo

As some scientists believe, twentieth century science will be known for only three revolutionary theories: relativity, quantum mechanics, and chaos theory. Chaos theory refers to systems that, despite their irregularities, contain a latent regularity which express irregular, unpredictable, complicated and nonlinear behavior. Although chaos theory was proposed first in natural sciences, a number of social scientists in recent years have tried to apply this theory to social sciences and shed new lights on social or political phenomena. The main argument of our discussion is that although some social scientists, like Talcott Parsons and Niklas Luman, attempt to consider society as a system, their explanations are valid only for developed societies, since the conditions of developing countries, such as countries in the Middle East, are more in harmony with a chaotic system, and show the characteristics of such a system like butterfly effect, strange attractors, and fractal structure.

Time- 11:25-11:45 am, Location- Field House Auditorium Room 2200

6. The Experience and Health Effects of Public Insurance Stigma for Low-income Health Seekers

Anna Martinez, Linda Hunt
Anthropology, Michigan State University

As part of a larger qualitative study on Medicaid expansion, this study examines the healthcare experiences of a group of low-income public health insurance beneficiaries in a Midwestern state. This paper discusses their experiences of healthcare stigma and its effects on their quality of care and health seeking. We found that participants primarily experienced stigma in the forms of poor quality care and negative interpersonal interactions in the healthcare setting. Using an intersectional approach, we found that the stigma of public insurance was compounded with other sources of stigma in healthcare including socioeconomic status, race, gender, and illness status. Participant experiences of healthcare stigma had important consequences for their quality of care, continuity of care, and health care access. We argue that the stigma related to public insurance fosters unequal forms of care and is a public health concern that should be addressed in Medicaid policy.

Time- 10:25-10:45 am, Location- Field House Auditorium Room 2220

7. Food Insecurity: Understanding Barriers of Healthy Eating

Ariel Dodgson, Jessica Kruger
Public and Allied Health, BGSU

Food insecurity is not being able to provide adequate quality or quantity of food for a household. Food for Thought is a local organization with a mission to feed Toledo in a thoughtful way. In a recent needs assessment conducted at their pantry locations which are spread out around Lucas county they found the rate of food insecurity to be nearly double of what was recored in the Lucas County needs assessment (36%). Sixty-two percent of those surveyed (N=200) reported being food insecure in the Food for Thought assessment. Upon further investigation, the organization found that those who are food insecure cite having more barriers to preparing food. The organization is working on innovative ways to reduce these barriers. This presentation will describe the population served, the issue of food insecurity, and provide an outline of steps the organization is taking to better serve its patrons.

Time- 1:30-1:50 pm, Location- Field House Auditorium Room 2200

8. Clarifying the determinants of healthy and unhealthy behaviors in urban, minority teenagers: Distinct roles of positive and negative affect

Ashley Murray, Andrew Geers
Psychology, University of Toledo

Although traditional health behavior theories focus on changing cognitions (e.g., beliefs), emerging research suggests that feelings are also a critical determinant of health behavior. So far, however, positive feelings and negative feelings have not been measured separately and thus it is unclear if they uniquely predict health behavior. Further, little to none of the existing affect-exercise research has been conducted with teenagers, minorities, or those of low SES—individuals who are at a high risk for unhealthy behavior. We surveyed 1448 predominantly minority teenagers from urban high schools in the city of Detroit. We assessed positive affect, negative affect, and instrumental beliefs towards exercise and fruit and vegetable consumption. We also measured exercise and consumption behavior. Regression analyses indicated that positive affect was the strongest predictor of health behavior across all three domains, followed by instrumental beliefs. Importantly, negative affect did not predict any of the health behaviors.

Time- 2:10-2:30 pm, Location- Field House Auditorium Room 2200

9. It's Not Just You, Spiders are Scary: The Effect That Fear of Predators may have on Climate Change

Audrey Maran, Shannon Pelini
Biological Sciences, Bowling Green State University

Soil CO₂ emissions (respiration) contribute 10x the amount of CO₂ that results from human activity. Therefore, identifying the factors that control soil respiration will improve our ability to predict climate change. Despite the role of invertebrates (e.g. springtails, mites) in soil systems, they are excluded from climate change models. Invertebrates consume and alter the habitat of microbes, which account for much of soil respiration. By consuming or inducing fear in these invertebrates, predators may alter soil CO₂ emissions. We examined the effects of a predator under different warming scenarios. We altered presence of wolf spiders in mesocosms containing a forest floor community and placed the mesocosms in warming chambers ranging from 1.5-5.5° C above ambient. We found respiration increased with warming when predators were absent, but not when predators were present. Predators did not affect invertebrate abundance, suggesting that they mediated response of microbial respiration to warming by inducing fear.

Time- 10:45-11:05 am, Location- Field House Auditorium Room 1230

10. M₃Ag₁₇(SPh)₁₂ Nanoparticles and Their Structure Prediction

Aydar Atnagulov, Terry Bigioni
Department of Chemistry and Biochemistry, University of Toledo

Among silver molecular nanoparticles (MNPs) capped with aromatic ligands, only one structure has been determined prior to this work: M₄Ag₄₄(SPh)₃₀, where M is a monocation, and SPh is an aromatic thiolate ligand. Such a lack of other structures is explained by the difficulty in synthesizing other silver MNPs with aromatic thiols. Here, by using 4-tert-butylbenzene-thiol (TBBT) we were able to synthesize a new nanoparticle, M₃Ag₁₇(TBBT)₁₂. A small number of constituents of this new nanoparticle and careful analysis of other nanoparticle structures reported previously allowed us to predict a structure of Ag₁₇. Density functional theory calculations predict a HOMO–LUMO energy gap of 1.77 eV. Moreover, we propose a new capping motif, Ag(SR)₃, for Ag molecular nanoparticles. The proposed structure was tested by heteroatom substitution and the results strongly support our prediction.

Time- 10:45-11:05 am, Location- Field House Auditorium Room 2250

11. Green and High-Yield Synthesis of Single-Sized Molecular Silver Nanoparticles

Badri Bhattarai, Terry Bigioni

Chemistry and Biochemistry, The University of Toledo

A solvent-free method of synthesizing silver nanoparticles, namely, $\text{Na}_4\text{Ag}_{44}(\text{p-MBA})_{30}$, has been developed using a silver-thiolate precursor paste instead of a metal salt solution. The synthesis produces pure $\text{Na}_4\text{Ag}_{44}(\text{p-MBA})_{30}$, without the need of size sorting with an excellent yield of 89%. In contrast to mainstream nanoparticle synthetic methods, this method demonstrates not only the possibility of elimination of solvents in the nanoparticle synthesis but also solves the problem of heterogeneity of reaction mixture in solid-state reactions. In addition, this method minimizes the health risk associated with free thiols as the starting material is silver thiolate polymer. Here, we demonstrate a green synthetic route for nanoparticles synthesis that eliminates the tremendous amount of solvent waste, yet an excellent yield that all the nanoparticles synthesis could be driven through this route in the years to come.

Time- 10:25-10:45 am, Location- Field House Auditorium Room 2250

12. Is Learning in Mother-Tongue Language Responsible for Better Health Outcomes?

Biniyam Yemane, Professor Anne Royalty

Economics, Indiana University-Purdue University Indianapolis

This paper investigates the effects of mother tongue education on child health outcomes by exploiting the 1990's language policy reform of Ethiopia. The reform mandated the use of students' mother tongue as a medium of instruction in primary school instead of the country's national language, Amharic. Using variations

across cohorts and languages in exposure to the policy, I use a difference-in-difference identification strategy to evaluate the effect of the reform. Prior qualitative evidence suggests that poor implementation of the policy without proper training of teachers who are proficient in non-Amahric languages and inadequate supply of pedagogical materials led to unintended effects of the policy during this transition period. This paper will investigate further its impact on health.

Time- 9:45-10:05 am, Location- Field House Auditorium Room 2220

13. Development of a Novel Testing Protocol to Increase the Sensitivity of Environmental DNA (eDNA) Monitoring for Aquatic Organisms

Breanna Caton, Von Sigler

Environmental Science, University of Toledo

The emerging molecular techniques of environmental DNA offer the potential to detect the species composition of an ecosystem by means of non-invasive environmental sampling (water samples). Despite the radiation of eDNA research since 2008, there are still large knowledge gaps and a need for standardized methods that must be addressed before eDNA can be utilized as a wide-spread management tool. Employing the round goby (*Neogobius melanostomus*) as a model organism, species-specific cytochrome b primers were developed for a series of laboratory and field experiments to evaluate eDNA detection efficacy under local environmental conditions. The benefits of this novel qPCR testing protocol are: results that accurately determine environmental residence time; generation of gene sequences suitable for population genetic analysis; and decreased likelihood of false positive results from cross-amplification. This multi-amplicon protocol is optimized for higher resolution species-specific surveys for organisms requiring time-sensitive monitoring.

Time- 2:30-2:50 pm, Location- Field House Auditorium Room 2240

14. Anuran Monitoring Results in the Oak Openings Region

Brittani Furlong, Todd Crail

Environmental Sciences, University of Toledo

The Oak Openings Region is home to ten of the fifteen anuran species of Ohio and provides critical wet prairie habitat however, woody plant encroachment threatens wet prairies. Woody plant management alters habitat and I expect this to effect anuran presence and abundance. Citizen scientists completed surveys using audio point count, funnel trap, water depth, and modified p-plot vegetation methods to determine if anurans positively respond to woody plant management in the Oak Openings Region. I hypothesized that average anuran call index and abundance would have a negative correlation with average woody stem densities and a positive correlation with water depth. I performed a series of linear regressions to examine the relationships of average anuran call index and abundance with woody stem densities and water depth. I found both average anuran call index and average anuran abundance have a significant negative relationship with average woody stem densities however, only average abundance had a positive relationship with water depth.

Time- 2:50-3:10 pm, Location- Field House Auditorium Room 2270

15. Burning Love: The attraction of soil invertebrates to micronutrients along a burn chronosequence

Caitlin Maloney, Shannon Pelini

Biological Sciences, Bowling Green State University

Soil microbivores, detritivores, and predators play an important role in carbon cycling along the forest floor. While it is known that these organisms are affected by key macronutrients (nitrogen and phosphorus), little is known about the effects of micronutrients (calcium, magnesium, etc.) on this community and their activity as forests age. We are working towards filling this gap by fertilizing the leaf litter with sodium, calcium, and manganese and placing decomposition bags in forests at different transitional stages following experimental burns. We predict increased invertebrate abundance, diversity, and decomposition activity in micronutrient-subsidized plots, but we expect this increases to be less significant where micronutrients are more available. This work will improve our understanding of controls on ecological processes and their responses to environmental change. Ultimately, this study gives us insight into the complex mechanisms of forest floor processes and how these processes may be changed by disturbance and subsequent recovery.

Time- 1:30-1:50 pm, Location- Field House Auditorium Room 2270

16. For the lava micronutrients: A bug's life in Hawaii

Cari Ritzenthaler, Shannon Pelini

Biological Sciences, Bowling Green State University

“Hawaii” invokes thoughts about beautiful birds, spectacular waterfalls, and colorful hibiscus. But few give thought to the forest floor. Yet, so much mystery lies within the decaying leaf litter and invertebrates. Without forest floor invertebrates to consume, and move leaf litter, Hawaii and all of the world’s forests would be brown, rather than green. Decomposition, especially in tropical forests, is a substantial, natural source of carbon dioxide emissions to the atmosphere. Therein lies the mystery: What controls the extent to which these invertebrates decompose forest floor debris, and consequently drive greenhouse gas emissions? While climate and macronutrients (elements available in relatively large quantities, e.g., carbon) are the usual suspects, preliminary findings suggest that the understudied micronutrients (elements available in relatively small quantities, e.g., calcium) may be the driving force. We’re exploring this by examining relationships between climate, nutrient availability, invertebrate communities, and decomposition along an elevational gradient in Hawaii.

Time- 1:50-2:10 pm, Location- Field House Auditorium Room 2270

17. Evaluating Relative Importance of Nutrient and Productivity Gradients on Fish-Community Structure in Lake Erie

Casey Yanos, Christine Mayer

Environmental Sciences, University of Toledo

Nutrient gradients drive productivity gradients in Lake Erie. This study was designed to understand how productivity affects energy flow to fish and fish-community structure. We used classification and regression trees to determine which environmental factors most influence total fish biomass and percent percid biomass (an indicator of desirable fish community). Region explains the majority of variance in total biomass whereas benthic and pelagic foodweb structure explains the most variance in percent percid biomass. When the Maumee River plume region is separated, variability in total biomass decreases by 51% and total phosphorus becomes the most important factor influencing total biomass. Total benthic and zooplankton biomass are the most important factors influencing percent percid biomass, however together they explain a small amount of variance. Therefore productivity strongly influences total fish biomass but availability of benthic and pelagic food weakly affect fish species composition.

Time- 10:45-11:05 am, Location- Field House Auditorium Room 2240

18. MEOX2 Regulation of Fetal Endothelial Progenitor Cell Function

Cassandra Gohn, Laura Haneline

Cellular and Integrative Physiology, Indiana University School of Medicine

The prevalence of diabetes during pregnancy is continuing to rise, and it has become a common complication. Studies have shown that exposure to a hyperglycemic intrauterine environment results in negative fetal outcomes throughout the life of the child, including cardiovascular morbidity. The central hypothesis is that upregulated Mesenchyme Homeobox 2 (MEOX2) in fetal endothelial colony forming cells from diabetic pregnancies decreases tube formation through increased senescence and altered cell cycle progression. Using overexpression and knockdown techniques, MEOX2 was found to serve a cardioprotective role. Specifically MEOX2-overexpression increased tube formation (n=3 transductions, $p < 0.03$), altered cell cycle progression (n=3 transductions, $p = 0.001$), and decreased senescence (n=4 transductions, $p = 0.01$). Further, MEOX2-knockdown decreased tube formation (n=12 transfections, $p < 0.004$), while cell cycle progression (n=9 transfections, $p > 0.05$) and senescence (n=5 transductions, $p > 0.05$) were unchanged. Ultimately, the goal is to establish MEOX2 as a potential therapeutic target to restore angiogenesis in children of diabetic mothers.

Time- 9:45-10:05 am, Location- Field House Auditorium Room 2260

19. The Role of Emerging Farmers' Personal Networks in Market Access and Start-Up Farm Success

Christian Scott, Robert Richardson
Community Sustainability, Michigan State University

The Mid-Michigan local food system harbors a wide variety of local farms ranging from new to long established operations. Market access plays a key role in the sustained success of these farms, particularly emerging farmers. The study examines the personal networks of Mid-Michigan's emerging farmers and identify characteristics of farmers with differing backgrounds as they relate to their market access decisions. The study examines the social ties among farmers through the use of network analysis and measures of social connectedness. Study findings yield insights into the relationship between social networks and market access among emerging farmers in Mid-Michigan, and the factors contributing to the sustainability of the farmers' operations. Through analysis and comparison of long-term indicators of likely success, entrepreneurial farming aspects of the incubator farm program's participants emerge. Farmers identify what it means to know the ideal people to enter the local food economic scene. The study then examines what that means for their individualized definition of success and what these networks mean to each farmer and the incubator program as a whole.

Time- 1:50-2:10 pm, Location- Field House Auditorium Room 2200

20. Negotiated Frenchness: Belonging and Identity in suburban Paris

Damian Peoples, Gayatri Reddy
Anthropology, University of Illinois at Chicago

French national mythology depicts France as a colorblind society that has historically welcomed and successfully incorporated waves of immigrants. French republicanism presumes an individualistic approach to political participation based upon the universal values, downplaying ethno-racial affiliations and differences in the public sphere. Despite claims of a colorblind society, many French feel stigmatized by their ethno-racial origins and have initiated urban uprisings in response to their marginalization. This is especially true for French peoples of African origin. A significantly higher unemployment rate and evidence of racial profiling by police are often cited to substantiate this claim. Thus, French non-Whites are in the paradoxical position of being both marked and unmarked. French colorblind ideology does not recognize racial difference, yet French citizens of African origin, through their negative interactions with state institutions, feel stigmatized. My research examines how conceptions of racial difference are negotiated amongst and between Black and North African citizens.

Time- 10:05-10:25 am, Location- Field House Auditorium Room 2200

21. The Role of Attitudes and Violence Risk Communication in the Conditional Release of Insanity Acquitees

David Medved, Wes Bullock
Psychology, U Toledo

The communication of violence risk to legal decision makers (Heilbrun, Dvoskin, Hart, & McNiel, 1999) is relatively understudied. The way that case information is provided to legal decision-makers can have a dramatic effect on subsequent decisions (Monahan et al., 2002; Slovic, Monahan, & MacGregor, 2000; Slovic & Monahan, 1995). Most research in this area has examined the influence of unstructured clinical judgment versus actuarial risk assessment on juror decision-making in death penalty cases (Krauss & Sales, 2001), but to date, no research has focused on the comparison of these in the context of conditional release planning for insanity acquitees. The purpose of this study is to investigate the effect the presentation style of risk assessment information and participant attitudes regarding mental illness and the insanity defense on hypothetical decision-making regarding the conditional release of insanity acquitees.

Time- 1:30-1:50 pm, Location- Field House Auditorium Room 1230

22. Drought Decreases Nutrient Uptake and the Levels of Nutrient-Uptake and -Assimilation Proteins in Roots of Corn and Big Bluestem.

Deepesh Bista, Scott Heckathorn
Department of Environmental Sciences, University of Toledo

Climate models predict a reduction in precipitation and an increase in evapotranspiration rates in many regions of the world in coming decades, resulting in increased drought. In addition to decreasing plant growth and reproduction, drought also decreases the concentration (%) of nitrogen (N) and phosphorous (P) in plant tissues, but the reasons for this decrease are not fully understood. Corn (*Zea mays*) and big bluestem (*Andropogon gerardii*), drought-sensitive and -tolerant warm-season grasses, respectively, were subjected to a gradual dry-down lasting ca. 3.5 weeks. Plants were harvested at mid and late drought (ca. 50% and 70-95% stomatal closure), at which times we measured biomass, tissue nutrient concentrations, nutrient uptake rates, and the concentration of nutrient-uptake proteins in roots (NO₃: NRT1, NH₄: AMT1, P: PHT1, B: BOR1, NIP5;1). Drought reduced the concentration of most nutrients in roots and shoots and the negative effects of drought on nutrient concentration, uptake, and uptake proteins were greater for late vs. mid drought.

Time- 10:05-10:25 am, Location- Field House Auditorium Room 1230

23. Does Phosphorus from Agricultural Tile Drains Fuel Algal Blooms?

Delilah Clement, Alan Steinman

Annis Water Resources Institute, Grand Valley State University

Phosphorus (P) is often implicated as a contributing factor to algal blooms. Attention has been focused on P in surface runoff, but tile drains also can be a source. Lake Macatawa is a hypereutrophic lake located in Michigan. The watershed is dominated by row crop agriculture, and further research is needed to understand the influence of bioavailable P originating from tile drains. I sampled tile drain effluent monthly to 1) measure total phosphorus (TP) and soluble reactive phosphorus (SRP) concentrations and 2) conduct bioassays to determine the effect of tile drain P on algal growth and community structure. TP concentrations ranged from 10-560 $\mu\text{g/L}$, and SRP ranged from 5-447 $\mu\text{g/L}$. Four of six bioassays resulted in a positive relationship between SRP and algal growth. There was a change in the algal community structure, but dominance was by diatoms, not cyanobacteria. Results will inform an ongoing restoration project in the watershed.

Time- 10:05-10:25 am, Location- Field House Auditorium Room 2240

24. Data Analysis Of Gene Expression And Biological Networks For Disease Subtyping

Diana Diaz, Sorin Draghici

Computer Science, Wayne State University

Current technologies can measure the expression of more than ten thousand genes at a time. Developing new computational methods to analyze all these data is needed. The first step when analyzing gene expression is disease subtyping, i.e. the discovery of molecular disease subtypes characterized by relevant clinical differences. However, clustering high-dimensional expression data are challenging due to noise and the curse of high-dimensionality. We developed a feature selection procedure for disease subtyping that is able to exploit the important information available in biological networks and clinical variables. This procedure estimates each network's probability of improving disease subtyping to select the best features for subtyping. We show that our approach successfully finds subtypes of patients with highly distinguishable survival profiles using two different clustering methods: k-means and SNF. Clusterings obtained with features selected by our approach have more distinctive survival patterns than traditional ones.

Time- 1:30-1:50 pm, Location- Field House Auditorium Room 2240

25. Catalytic Reductions Promoted by Solar Devices to Make Small Molecules

Dona Ruwani Nisansala Wasalathanthri, Dean M. Giolando
Chemistry & Biochemistry, University of Toledo

Depletion of fossil fuels is a major issue in the 21st century, thus the world needs to develop alternative energy sources. Dihydrogen has been identified as a good alternate energy carrier. Solar-driven water splitting offers a means of producing dihydrogen in an environmentally benign way using renewable solar energy and water. However, this method is still in need of highly active non-noble metal catalysts to drive the reaction efficiently. This research examines the catalytic activity of electrodeposited nickel-phosphide for the Hydrogen Evolution Reaction (HER). Results show that electrodeposited nickel-phosphide has good activity and stability in both acidic and alkaline media. The aim is to apply these catalysts on the stainless steel back contact of a triple junction amorphous silicon photovoltaic (PV) cell, and design an in-situ PV device capable of producing dihydrogen.

Time- 9:45-10:05 am, Location- Field House Auditorium Room 2210

26. Predicting the Ability of Anti-Donor Antibodies to Activate Complement

Dulat Bekbolsynov, Stanislaw Stepkowski
Medical Microbiology and Immunology, University of Toledo

Purpose: Antibodies against donor may cause rejection of a transplant, however, which antibodies are dangerous (cytotoxic) is poorly understood. Single-antigen beads assay (SAB) shows the presence of antibodies. We studied the antibody titer (measured by SAB mean fluorescence intensity, MFI), avidity and donor-recipient mismatch as predictors of antibody cytotoxicity.

Methods: Sera of 25 patients were characterized with SAB and complement activation assays, avidity and mismatch analyses.

Results: The sensitivity and specificity of SAB for prediction of complement activation was over 0.88, and area under the curve was over 0.90. Logistic regression model was built that predicts the probability of an antibody to be cytotoxic at different SAB MFI levels. Analysis of antibody avidity and donor-recipient mismatch was also done.

Conclusion: SAB MFI correlates with the ability to activate complement and predicts thus the cytotoxic potential of antibodies. Preliminarily, the same holds true for antibody avidity and donor-recipient mismatch as well.

Time- 2:50-3:10 pm, Location- Field House Auditorium Room 2210

27. Spatial Distribution of Concentrated Animal Feeding Operations in the Lake Erie Basin: Debunking Myths and Supporting Reality on Social and Environmental Impact

Edwina Kofi-Opata, Patrick Lawrence
Geography & Planning, University of Toledo

Concentrated Animal Feeding Operations (CAFOs) have become a somewhat permanent feature in the agricultural landscape of the United States following high consumption of meat, milk and eggs. Some of the arguments raised by its advocates include affordability of products, economic boost to ailing economies as a result of the citing of a facility, employment and specialization among others. Its opponents on the other hand argue for stricter regulation in the wake of environmental and public health concerns associated with CAFO operations. As a research in progress, I attempt to examine the social and environmental impact of CAFOs in the Lake Erie Basin by performing a spatial analysis using the Moran's I and Getis Ord G_i^* statistics to explore the spatial distribution in the Lake Erie Basin. The distribution pattern will be analyzed to determine the socio-economic characteristics of the communities where facilities are densely cited and where they are absent in the hopes of exploring the relationship between communities and CAFO facilities. One major argument raised by proponents is the issue of waste. Large volumes of waste produced are more than the disposal methods employed – applying to farm fields, transporting off facilities – thus a spatial model will be developed to highlight the potential impact on water quality based on distance traveled.

Time- 2:50-3:10 pm, Location- Field House Auditorium Room 2200

28. A Climate-Driven Shift In Soil Detritivore Community Dynamics Could Hold Significant Consequences For Forest Ecosystems

Eric Moore, Shannon Pelini
Biological Sciences, Bowling Green State University

Elevated temperature caused by greenhouse gas emissions may exacerbate climate change via a positive feedback from increased CO₂ released as a product of soil microbial respiration. Soil invertebrates affect microbial respiration and ecosystem processes like nutrient uptake and losses. However, invertebrates are ignored in climate models. Detritivores modify soil properties, food availability and habitat for microbes, but exhibit physiological and behavioral changes in response to heat stress. Thus, interactions among these taxa, elements of nutrient cycling, and CO₂ emissions via respiration, may be altered under elevated temperatures.

I will construct mesocosms representative of forest floor components that will be placed in two warming scenarios (+0°C, +5°C) and contain different combinations of three detritivores including two earthworms *L. terrestris* and *L. rubellus*, and a millipede *N. americanus*. Specifically, I am interested in how species-specific functional traits and interactions among taxa will contribute to individual fitness, ecosystem effects, and microbe activity.

Time- 9:45-10:05 am, Location- Field House Auditorium Room 1230

29. The Adoption Of Online Education By Traditional Liberal Arts Colleges

Ericka Hollis, Wayne Lewis

Educational Leadership Studies, University of Kentucky

The growth of online education has become a rapidly changing issue for faculty and administration in higher education. To understand more about uptake of online education, this study investigates the adoption of online education by traditional liberal arts institutions (TLACs). TLACs are defined as four-year institutions that exclusively focus institutional goals and curricular structures on undergraduate studies in the fields of arts and sciences with no professional or graduate studies. Currently, these institutions face numerous challenges as they evolve to remain relevant in the twenty-first century. Two research questions guide this research study: 1) To what extent has online education been adopted at traditional liberal arts colleges? 2) How do presidents at traditional liberal arts colleges think about the adoption of online education at their institutions? Using Diffusion of Innovations as a theoretical framework, this study employs a two-phase, sequential mixed method design.

30. Adopting Online Teaching Strategies at a Research University: Faculty Perceptions

Ericka Hollis, Wayne Lewis

Educational Leadership Studies, University of Kentucky

Utilizing Moore and Benbasat's (1991) conceptualization of diffusion of innovations (DoI) model, this study examined the adoption of online teaching strategies by faculty at a university with very high research activity. The purpose of this study was two-fold: 1) to understand what pedagogical changes occurred as a result of the one-week long eLearning Innovation Initiative (eLII)-funded professional development and 2) to understand the perceptions of the DoI factors that influence the level of adoption in online teaching by faculty participants. The analysis was based on data collected from surveys and semi-structured interviews. Using a mixed methods approach, this research study investigated the eight perceived characteristics of innovation: voluntariness, image, relative advantage, compatibility, ease of use, trialability, result of demonstrability, and visibility. The findings indicate relative advantage, compatibility, and trialability are the most salient factors for faculty when implementing online teaching strategies gained from professional development into practice.

Time- 1:50-2:10 pm, Location- Field House Auditorium Room 2230

31. Stigmatization & Self-Affirmation: Reducing Biased Processing of Weight-Related Cues

Erin Vogel, Jason Rose
Psychology, University of Toledo

Although popular belief dictates that discriminating against overweight people will encourage them to make healthy choices, weight stigma has been shown to cause counterproductive health behaviors. Because self-affirmation has been found to reduce biased processing of threatening health information, we hypothesized that self-affirmation would reduce avoidance of weight- and health-related cues after experiencing stigma. Participants were randomly assigned to conditions in a 2 (Stigma or Control) X 2 (Self-Affirmation or Control) design. Participants read an article about losing weight (stigma condition) or quitting smoking (control condition). Participants in the self-affirmation condition wrote an essay about their most important value; participants in the control condition wrote a neutral essay. All participants completed a dot probe task designed to measure attentional bias against weight- and health-related cues. Partially consistent with our hypothesis, results showed that participants who self-affirmed showed (marginally) less bias against threatening cues compared to those who did not self-affirm.

Time- 10:05-10:25 am, Location- Field House Auditorium Room 2220

32. Physical Unclonable Functions for Hardware Oriented Security and Trust

Fathi Amsaad, Mohamed Niamat
EECS, The University of Toledo

This talk will be focused on the state-of-art topic of Hardware Oriented Security and Trust; namely Physical Unclonable Functions (PUF). PUF is a physical entity that has fingerprint features and is inherently unclonable using challenge-response behaviors. The main topic of this talk is Silicon PUFs (SPUFs), specifically Ring Oscillators PUFs (ROPUFs). A comparison between emerging SPUFs primitives will be presented. This talk shows the implantations of ROPUFs on FPGA chips. Finally, the performance of the generated ROPUF response bits is validated in terms of intra-die Hamming distance to evaluate ROPUF uniqueness and inter-die Hamming weight to evaluate ROPUF reliability under varying voltages & temperatures variations.

Time- 2:30-2:50 pm, Location- Field House Auditorium Room 1230

33. Brief Mind Clearing as a Resource: How Clearing Your Mind Is Physiologically Beneficial

Fawn Caplandies, Andrew L. Geers
Psychology, University of Toledo

We examined how a brief mind clearing exercise alters reactions to a laboratory stressor. We did so using the Biopsychosocial Model (BPS) of Threat and Challenge. According to the BPS model, individuals exhibit more challenge responding when they perceive themselves as having enough resources to handle a task, and more threat responding when they do not. We theorized that using a mind clearing exercise prior to a stressor task would increase perceptions of resources and prompt challenge responding. To test this idea, participants were given mind clearing instructions (positively or negatively framed) or no mind clearing instructions during a 10 minute period prior to a stressor task. Consistent with the BPS, the mind clearing participants displayed physiological indicators of challenge, whereas no instruction participants displayed physiological indicators of threat ($p < .05$). Further, and consistent with the BPS, the positive framing instructions produced stronger challenge responding than the negative frame.

Time- 1:10-1:30 pm, Location- Field House Auditorium Room 2260

34. Raf Kinase Inhibitory Protein (RKIP) and RhoA GTPase In Regulating Tumor Invasion In Mammary Cell Carcinoma

Gardiyawasam Kalpana, Kam Yeung
Cancer Biology and Biochemistry, University of Toledo

Tumor metastasis is a complex process involving multiple steps as local invasion, angiogenesis, intravasation, survival in circulation, extravasation and colonization in distant sites. Tumor metastasis suppressors are proteins that has the ability to inhibit metastasis by inhibiting any of above steps. Raf kinase inhibitory protein is a one such tumor metastasis suppressor. The molecular mechanism through which RKIP execute its anti-metastasis effect is not yet completely defined, although it appears to follow a more than one approach. We have previously reported that RKIP inhibit metastasis through regulating CCL5 chemokine expression to block the recruitment of pro-metastatic tumor macrophages and also by regulating matrix metalloproteases during local invasion. In our present study we observed that the altered expression of RKIP affects the activity of RhoA in cell-based studies. RhoA is a member of the Rho family GTPases that are key regulators of cell motility. Currently, we are investigating the regulatory relationship between RhoA and RKIP, and its effect on the invasiveness of tumor cells.

Time- 1:10-1:30 pm, Location- Field House Auditorium Room 2220

35. RF-Sputtered Amorphous Cd₂SnO₄ for CdTe Solar Cells

Geethika Liyanage, Michael Heben

Physics and Astronomy-PVIC, University of Toledo

Cd₂SnO₄ (CTO) is an interesting material as a Transparent conducting oxide for Photovoltaic devices. Typically, for high quality CTO requires a high temperature annealing step to achieve the desired optical and electrical properties of the film. We have developed a process by which this step may be eliminated, using the fact that high efficiency CdTe absorber layers are deposited at high temperatures by the closed space sublimation (CSS) technique. After the CSS process, the prepared CTO films showed a significant enhancement in the electrical and optical properties. Electron mobility increased from ~10.0 to ~40.0 cm²/Vs and carrier concentration increased two orders of magnitude compared to the as-deposited films. The band gap and transparency of the films also increased. CdTe devices were completed on a number of substrates, with preliminary device efficiency of 14.5% on a light weight flexible substrate.

Time- 10:25-10:45 am, Location- Field House Auditorium Room 2210

36. Smart T-Shirt

Gelareh Raoufi, Subhas Gosh

School of Visual and Built Environments, Eastern Michigan University

T-shirts are one of the most popular clothing pieces that continue to influence in the world. It is critically important to fashion designers to understand reasons for T-shirt's popularity, the effect of nanotechnology on the T-shirt, and the future of T-shirts. Quick-drying material and easy wear ability are some of the T-shirt benefits that can persuade people to wear it every day. Nanotechnology can reduce the overall cost of T-shirts and enhance the quality of the fabric. Therefore, in the near future, nanotechnology T-shirts will be affordable and accessible to customers and it will reduce environmental impact. This research shows how nanotechnologies T-shirts, smart T-shirt, have a wide range of advantages that can promote easier life and reduce energy consumption. Therefore, all of these reasons can help to understand why the T-shirt is currently popular and the nanotechnology T-shirt can contribute to the development in the future.

Time- 2:30-2:50 pm, Location- Field House Auditorium Room 2250

37. "Letters to Karla" an Imagined Correspondence with Canada's most Notorious Female Criminal

Gloria Diaz, Lewis Roberts

English and Linguistics, Indiana-Purdue University Fort Wayne

For an "engaged" research paper, I wrote a series of letters to Karla Homolka, then "wrote" back to myself as Karla. I was curious as to why someone so otherwise strong and independent would allow herself to be so manipulated by Paul Bernardo. It is frightening to me that a man who looked so nice and seemingly had such a bright future turned out to be such a scary person. I also wonder what I would have done in Karla's place.

Time- 1:50-2:10 pm, Location- Field House Auditorium Room 2250

38. Structural and Inhibitor Screening Studies of Fungal Forms of Aspartate Semialdehyde Dehydrogenase

Gopal Dahal, Ronald Viola

Chemistry and Biochemistry, University of Toledo

Aspartate semialdehyde dehydrogenase (ASADH) functions at a critical junction in the aspartate biosynthetic pathway and represents a validated target for antimicrobial drug design. This enzyme catalyzes the NADPH-dependent reductive dephosphorylation of β -aspartyl phosphate to produce the key intermediate aspartate semialdehyde. Production of this intermediate represents the first committed step for the biosynthesis of essential amino acids in fungi and in bacteria. The absence of this enzyme in humans and other mammals will allow selective targeting of pathogenic microorganisms. The structure of a new fungal form of ASADH from *Cryptococcus neoformans* has been determined to 2.6 Å resolution. A customized fragment library has been screened against several fungal ASADHs and initial hits have been identified with inhibition constants (K_i) in the low millimolar range. The ASADH obtained from this fungal species have shown different inhibition selectivity when compared to this enzyme from bacterial species and also differences between fungal species. Docking studies with the CnASADH structure are being used to guide the design and development of potent inhibitors. This work is supported by funding from the NIH (AI077720).

Time- 1:10-1:30 pm, Location- Field House Auditorium Room 2210

39. Stereoselective Construction of B-Mannopyranosides via Anomeric O-Alkylation: Synthesis of the Trisaccharide Core of N-Linked Glycans

Hai Nguyen, Jianglong Zhu

Chemistry and Biochemistry, University of Toledo

Glycans of glycoproteins play essential roles in biological processes. While O-linked glycans are attached to serine or threonine residues, N-linked glycans attached to asparagine residue of glycoproteins. Despite the significance of the glycans, the understanding of their detailed function is often complicated by the heterogeneous glycoforms of glycoproteins. Therefore, it is important to access these glycans in chemically pure form in order to study their biological properties. For the synthesis of N-linked glycans, one of the long-standing challenges is the stereoselective construction of β -mannopyranosides. Despite several methods developed for the synthesis of β -mannopyranosides, in those reactions oftentimes beta-mannosides were also formed. Thus, an efficient approach which would enable the formation of sole β -mannopyranosides is appealing. In this presentation, we will describe our recent progress in the stereoselective construction of beta-mannopyranosides via anomeric O-alkylation.

Time- 9:45-10:05 am, Location- Field House Auditorium Room 2270

40. Determination of Amplification of Cellular Effects by Hormones Derived from Different Tissues

Hamideh Keshavarz, Dana Spence

Chemistry, Michigan State University

Leptin, a hormone produced mainly by adipose tissue, is believed to balance in vivo energy level by regulation of food intake and body weight. Higher concentrations of leptin are observed in obese people, who are thought to be “leptin resistant”. Leptin resistance is common in patients with diabetes and studies show leptin can have glucoregulatory effect on patients with type 1 and type 2 diabetes. In spite of this, obese diabetic patients do not exhibit strong response to exogenous leptin. Thus, a detailed understanding of the glucose regulatory function of leptin is of crucial importance in order to overcome the shortcomings of leptin therapy and its use as a potential therapeutic for humans. Previously, our group has reported that C-peptide, a 31 amino acid peptide secreted from pancreatic beta cells, binds to red blood cells (RBCs) and has cellular energetic effects. Here, we show that leptin amplifies these C-peptide effects. Using a 3D printed microfluidic device, measurements were performed to determine ATP release from RBCs that had been incubated with C-peptide, zinc, and leptin and combinations thereof. In the presence of C-peptide and zinc, a significant increase in RBC-derived ATP is measured; this signal is further significantly enhanced in the presence of leptin. Importantly, leptin alone has no effect on the RBC. To improve the measurement scheme, we have also explored the design of a fluidic device that will contain adipose tissue, insulin and C-peptide secreting INS-1 cells and a flowing stream of blood cells to confirm our preliminary findings in an enhanced organ-on-chip format.

Time- 10:25-10:45 am, Location- Field House Auditorium Room 2260

41. Targeting Chemo-Resistant Colon Cancer by Inhibiting Embryonic Resistance Pathways

Haneen Amawi, Amit Tiwari

Department of Pharmacology and Experimental Therapeutics, University of Toledo

Colorectal cancer (CRC) is the second-leading cause of cancer death in developed countries. We designed and synthesized eight analogues, based on a pyrimido[1,2:1,5]-pyrazolo[3,4-b]quinoline(PPQ)-("IND-2") structure. "IND-2," demonstrated robust anticancer efficacy, selectivity to colon cancer cells, negligible toxicity to normal cells and absent cellular efflux via multidrug transporters, but remained vulnerable to metabolic inactivation and poor bioavailability. Based on our preliminary microarray analyses of 47,000 genes, and our findings of IND-2-facilitated transcriptional downregulation of several genes of embryonic-WNT/EMT-signaling-axis, we further synthesized 14 IND-2 derivatives that we herein set forth to characterize in in-vitro and In-vivo CRC models, specifically assessing the abovementioned vulnerabilities. We hypothesize that embryonic signal pathways play an important role in colorectal tumorigenesis and can be targeted for the development of safe and efficacious drugs. We are assessing these analogs in normal and cancerous cell lines, to select the most promising candidates for scaled-up synthesis and extensive in-vivo testing.

Time- 2:30-2:50 pm, Location- Field House Auditorium Room 2220

42. A Meta-Analysis to Potential Toxicity of Emerging Pv Cells

Ilke Celik, Defne Apul

Civil Engineering, University of Toledo

Similar to conventional energy sources, energy production from solar can also result in the release of certain chemicals during the entire lifetime, starting from the extraction of the metals used and extending to the end of life. The rapid improvement in the performance of photovoltaic (pv) solar cells has resulted in an overall reduction in the environmental impacts while the source of the impacts has shifted from the processing energy to the materials themselves. Moreover, many new materials are being proposed as low-cost, high efficiency alternatives. We performed a meta-analysis of the potential toxicity for new materials to provide insight into material selection processes. The aim of this study is to determine the environmental impacts of a range of next generation solar cells materials that utilize organo-halide, earth abundant, or quantum dot materials.

Time- 11:05-11:25 am, Location- Field House Auditorium Room 2210

43. The Discovery of Novel Germline Variants in Hereditary Ovarian Cancer

Jaime Stafford, Michael Tainsky

Molecular Genetics and Genomics, Wayne State University

BACKGROUND: Ovarian cancer (OVCA) is the 5th most frequent cause of cancer-related death among women, with a five year survival rate of 42%. Approximately 24% of cases arise due to a germline mutation in a cancer susceptibility gene, however most of the inherited risk remains unexplained. We aim to discover novel variants that predispose to OVCA.

METHODS: We performed whole exome sequencing on 48 high risk OVCA patients negative for BRCA1/BRCA2 mutations. All putative causal SNPs were confirmed by Sanger sequencing.

RESULTS: The BRCA2 variant, K3326* (MAF=.004), resulting in a 93 amino acid truncation was over-represented in our sample (4/48, o/e=10). Although believed to be benign, it has recently been shown to be associated with susceptibility to esophageal, lung, aerodigestive tract, and pancreatic cancer. Two carriers had an additional moderately deleterious mutation, one in ATM and another in RAD51D. Therefore, the K3326* variant may act as a modifier of penetrance.

Time- 2:50-3:10 pm, Location- Field House Auditorium Room 2220

44. Thermal Degradation Studies Fluorine Doped Tin Oxide

Janani Kumar Reddy Manchala, Dean M. Giolando

Chemistry, University of Toledo

Fluorine doped tin oxide (FTO) films have been developed by atmospheric pressure chemical vapor deposition method (APCVD) at 560°C substrate temperature using tin tetrachloride, ethyl formate and 2,2,2-trifluoroethyl trifluoroacetate chemical systems on Soda lime glass and borosilicate substrates. The developed FTO films can be used as the substrates of Cd-Te solar cell. The FTO films are characterized using Tenma multimeter, UV-vis-NIR transmission and absorption spectroscopy, Scanning electron microscopy and Powder X-ray diffraction for electrical, Optical properties and surface morphologies of films.

Time- 11:05-11:25 am, Location- Field House Auditorium Room 2250

45. Dining out in Detroit: Exploring the Characteristics of Restaurant Travel

Jeanette Eckert, Igor Vojnovic
Geography, Michigan State University

While much has been written on food retail in the context of “food deserts,” less focus has been given to in-depth analysis of patterns of restaurants and travel behavior. Using the results of a travel survey in two neighborhoods in Detroit, Michigan, this research examines frequency of travel to restaurants, the type of restaurants frequented, and the distance and mode of travel of the trips. The travel behavior is then examined by socioeconomic characteristics. About 60% of respondents living in these disadvantaged areas of Detroit report dining out at least once per week, with the majority of those trips being to fast food restaurants in or close to their neighborhoods, as opposed to other types of restaurants. While recent research suggests that residents in these neighborhoods travel outside the neighborhood for groceries, in the case of restaurants respondents appear to take advantage of the convenient proximity of fast food locations.

Time- 10:45-11:05 am, Location- Field House Auditorium Room 2220

46. Meet the Neighbors: Identifying New Cold Stars in the Solar Neighborhood

Jennifer Greco, Michael Cushing
Department of Physics and Astronomy, University of Toledo

Brown dwarfs are substellar objects too low mass to initiate the hydrogen fusion necessary to be considered stars. Nearby stars and brown dwarfs exhibit larger motions across the sky (called proper motions) than more distant background stars because they are closer to the Sun. Recent discoveries with the Wide-field Infrared Survey Explorer (WISE; 2009-2010) have demonstrated that some of our closest brown dwarf neighbors remain undetected because of their low temperatures and high proper motions. WISE was reactivated in December 2013 to search for potentially hazardous near-Earth objects. We combined these data with the original 2010 data to identify missing members of the Solar neighborhood using their proper motions. This survey identified a total of 20,548 high proper motion objects, 1006 of which were new discoveries. We are currently performing follow-up observations to characterize many of these new discoveries. I will summarize the results of these observations to so far.

Time- 11:25-11:45 am, Location- Field House Auditorium Room 2230

47. Unexpected Variables in P3HT Synthesis

Jennifer Gadiant, Cora Lind-Kovacs
Chemistry and Biochemistry, University of Toledo

Conducting polymers have a wide range of applications, from flexible electronics to organic solar cells. In order to improve the devices which use these polymers, understanding how reaction conditions affect and change their properties is critical. In this work poly(3-hexylthiophene), a commonly studied conducting polymer, was synthesized in a variety of different solvents and binary mixtures. Polymerizations were run at room temperature for 24 hours with the reactant concentrations held constant in order to directly compare solvent effects on the polymer's average molecular weight (Mw). The Mw of every polymer was determined using MALDI-MS to determine the best solvent systems to synthesize high molecular weight polymers. Upon close inspection of the results some polymers had highly variable Mw between sample reproductions despite being synthesized under the same conditions. From these observations and the use of historical weather data it was determined that another variable was affecting the polymerization results.

Time- 11:25-11:45 am, Location- Field House Auditorium Room 2250

48. A Habitat Suitability Model For Possible Lake Sturgeon (*Acipenser Fulvescens*) Reintroduction In The Maumee River

Jessica Sherman, Jonathan Bossenbroek
Environmental Sciences, University of Toledo

Habitat suitability models can be used during species restoration to assess if current habitat has degraded relative to historic conditions, thereby making species reintroduction unfeasible. Lake sturgeon are a candidate for reintroduction in the Maumee River where they were historically abundant. We constructed a spatially explicit habitat suitability model for spawning adult and age-0 lake sturgeon for the lower Maumee River that includes habitat layers for substrate composition, water depth, water velocity, water quality characteristics, and habitat size and connectivity. This model will aid the development of a restoration plan for potential reintroduction of lake sturgeon into the Maumee River. Habitat suitability is delineated as good or moderate-good for optimal habitats, moderate, or moderate-poor or poor for suboptimal habitats. Preliminary analysis of just substrate and water depth suggest that more than 50% of the Maumee River is classified as good or moderate-good for spawning adults.

Time- 9:45-10:05 am, Location- Field House Auditorium Room 2240

49. Hedonic Effects in Intertemporal Decision Making and Perception of Future Time

Jinling Zhao, Ronaldo Vigo
Psychology, Ohio University

The present study examined the effects of anticipated pleasure to the smaller but sooner (SS) rewards, anticipated pleasure to the larger but delayed (LL) rewards, and subjective perception of future time (logarithmic function) on people's preference on SS rewards. Also, the study explored the relationship between subjective measure of time and the subjective measure of valuation in intertemporal choice. Participants (N = 51) were recruited for an online study. Results showed that people with a higher anticipated pleasure to SS rewards tended to choose more SS rewards while people with a higher anticipated pleasure to LL rewards tended to choose less SS rewards. People who reported a higher anticipated pleasure to SS rewards tended to report a higher pleasure to LL rewards as well. However, on average, participants reported significantly higher anticipated pleasure to SS rewards compared to anticipated pleasure to LL rewards. Furthermore, anticipated pleasure to SS rewards was found to interact with anticipated pleasure to LL rewards to influence subjective time perception. In addition, subjective time perception did not predict people's preference on SS rewards. Limitations and implications were also discussed.

Time- 1:30-1:50 pm, Location- Field House Auditorium Room 2260

50. Physician-Assisted Death: Lessons from the Dutch

John Frye, Stuart Youngner
Bioethics, Case Western Reserve University

The Oregon Death with Dignity Act is a model other states are emulating, though the practices' opponents still question the adequacy of its safeguards. They point to the Netherlands to argue that assisted dying is fraught with unregulatable ethical issues, and prone to slippery slopes to euthanizing individuals who either are physically healthy or lack capacity to consent. On the other hand, there is much to be learned from them regarding how to improve upon current practice. In the Dutch model of assisted dying: (1) the doctor is necessarily present at the end of life; (2) specially trained consultants oversee almost all cases; (3) review committees examine the full narrative of each case history; (4) these committees release annual reports with case-specific guidelines. Incorporating these characteristics into American practice would help address lingering concerns as well as help ensure physicians give the best of care to patients throughout the process.

Time- 9:45-10:05 am, Location- Field House Auditorium Room 2200

51. cAMP Dependent Recruitment of Acidic Organelles for Ca²⁺ Signaling in the Salivary Gland

John Imbery, David Giovannucci
Neuroscience, Toledo

Autonomic neural activation of intracellular Ca²⁺ release in parotid acinar cells induces the secretion of the fluid and protein components of primary saliva critical for maintaining overall oral homeostasis. In the current study, we profiled the role of acidic organelles in shaping the Ca²⁺ signals of parotid acini using a variety of imaging and pharmacological approaches. Results demonstrate that zymogen granules predominate as an apically polarized population of acidic organelles that contributes to the initial Ca²⁺ release. Moreover we provide evidence that highlights a role for the intracellular messenger NAADP in releasing Ca²⁺ from acidic organelles following elevation of cAMP. Our data is consistent with the trigger hypothesis where localized release of Ca²⁺ sensitizes canonical Ca²⁺ channels to enhance signals derived from the ER and may be important for initiating saliva secretion. The current study reveals a therapeutic target to potentially augment secretory activity in hypofunctioning salivary glands.

Time- 10:45-11:05 am, Location- Field House Auditorium Room 2260

52. Mapping Young Stars in Scattered Light to Understand the Star Formation Process

Joseph Booker, Tom Megeath
Physics and Astronomy, University of Toledo

The most interesting properties of a star, such as its habitability zone, lifetime, or contribution of chemical elements to the galaxy, are determined by its mass. A central question in astrophysics is why stars form with little variation in their masses - for example, the mean mass of nascent stars is half the Sun's mass despite large variations in their birth environments. To understand what controls the mass resulting from star formation, we seek a comprehensive understanding of the statistical properties of forming stars in the Orion Molecular Clouds, a relatively nearby and large starforming region. We present a systematic study of near-infrared Hubble Space Telescope images, using the high-spatial resolution to morphologically classify forming stars and quantify the effects of feedback through using computer vision techniques.

Time- 11:05-11:25 am, Location- Field House Auditorium Room 2230

53. Examining Urban and School Gardens in Toledo: Using Ecology and Education to Increase Food Access

Justin Burdine, Kevin McCluney
Biological Sciences, Bowling Green State University

Urban and school gardens have emerged as a viable resource for community outreach and education. They are an important resource for at-risk communities to learn about healthy foods and healthy lifestyles, while also serving as food outlets for communities with limited food access. This study focused on food access within the urban and school gardening context across Northwest Ohio. We wanted to better understand the ecological complexity within urban garden systems, and we collected data on diversity counts, sustainability practices, and production methods. Census data was utilized to map community demographics and to highlight issues of food access in the sampled regions. We found that urban gardens in Toledo can function as both hubs for social justice and examples of diverse growing system, with upwards of 82 crop varieties grown on a single urban garden. Many of these gardens function as complex greenspace that enhance ecosystem services and processes.

Time- 1:10-1:30 pm, Location- Field House Auditorium Room 2200

54. The Tumor Microenvironment Drives Tumor Progression Through an mDia2-Mediated Mechanism

Kaitlyn Dvorak, Kathryn Eisenmann
Biochemistry and Cancer Biology, Univeristy of Toledo

The tumor microenvironment (TME) is a heterogeneous region that is favorable for cancer formation and progression. Carcinoma-associated fibroblasts (CAFs) are abundant in the TME and enhance tumor cell motility via secreted-factors. We sought to understand how CAF-secreted chemokines impact breast tumor cell motility through modification of the cytoskeleton. Conditioned-media (CM) from a breast tumor CAF line dramatically enhanced wound-closure in MDA-MB-231 breast tumor cells. The chemokine CXCL12 is a candidate CAF-secreted-factor for increased migration. We previously showed a link between CXCL12 signaling and a cytoskeletal regulator, mammalian Diaphanous-related formin (mDia2). This formin regulates F-actin assembly and bundling and plays a role in tumor cell migration and invasion. CAF-CM-treated MDA-MB-231s have reduced mDia2 expression. It's unclear if CAF-derived CXCL12 suppresses mDia2 expression, thus promoting tumor cell motility. Current experiments are addressing this gap in the knowledge, potentially indicating a role for CAF-derived secreted-factors in modulating mDia2 function in migrating tumor cells.

Time- 1:30-1:50 pm, Location- Field House Auditorium Room 2220

55. A Sociopolitical Study of Online News in the Maghreb

Kamal Belmihoub, Margie Berns

English, Purdue University

This study shows that language reveals a negative stance by its users and divisiveness over a conflict. A small corpus of English and French online news is designed to examine Algerian and Moroccan journalists' stance towards their neighboring country, their potential use of divisive language, and how English and French might be used differently. The software AntConc is used to look at collocates of ALGERIA and MOROCCO. Frequencies, together with MI scores, were looked at to identify the words that are most associated with each country. KWICS were then looked at using a semantic prosody framework to reveal what stance those lexical items reflect. It is found that many words with unfavorable prosody are used by both Algerian and Moroccan journalists, while Reuters uses negative words only regarding Morocco, possibly because Morocco is directly involved with the Western Sahara conflict while Algeria plays a support role, albeit a major one. Also, while Algeria relies heavily on French, Morocco uses English more. Finally, the pronouns We and They reflect how journalists could foster divisiveness. Suggestions are made to improve awareness and use language in a way that helps solve the conflict rather than make it worse.

Time- 10:45-11:05 am, Location- Field House Auditorium Room 2200

56. Enhancement of Medical Images Using Modified Back Propagation

Kaveh Ahmadi, Ezzatollah Salari

EECS, University of Toledo

The resolution of acquired medical images is often limited and need to be up-sampled to provide more information to physicians. Super Resolution (SR) techniques are widely used in medical applications to enhance the image quality after acquisition. Conventional SR algorithms are generally unable to recover the high frequency (HF) information. This paper presents a novel method for resolution enhancement of medical images while keeping the HF information. In the first step, an image interpolation has been applied to increase the image resolution and remove HF information. In the second step, the reconstructed images are down-sampled again to the original image size. The HF information is simply found by subtracting the down-sampled image from the original image. The obtained HF data is used by a back propagation process to improve the final image quality. Experimental results prove the superiority of the proposed method in comparison with some of the traditional methods by providing images with better visual quality.

Time- 1:50-2:10 pm, Location- Field House Auditorium Room 2240

57. Airborne Influenza A Virus Detection As A Predictive Indicator Of Student Illness And Absenteeism

Kristen Coleman, Von Sigler

Environmental Sciences, University of Toledo

To investigate the relationship between airborne influenza A virus (IAV) and student illness, airborne IAV was sampled in an elementary school using NIOSH aerosol samplers four times per week throughout an eight-week sampling period during the 2013-2014 influenza season. Given that the incubation period for influenza is one to four days, IAV detection was hypothesized to precede upper respiratory infection (URI) and absenteeism among schoolchildren by that duration. Quantitative PCR targeting the IAV M gene revealed detectable IAV on four occasions, in densities of 2.0×10^{-1} , 5.7×10^3 , 1.5×10^4 and 1.9×10^4 gene copies m^{-3} air. Airborne IAV was associated with high rates of (i) student absences due to illness, and (ii) reported URI symptoms. These efforts have facilitated, to our knowledge, the first identification and quantification of airborne IAV in an elementary school. Results suggest that the timely detection of airborne IAV might serve as a predictive indicator of illness in schoolchildren.

Time- 11:05-11:25 am, Location- Field House Auditorium Room 2220

58. "Brace Yourselves. Prepare to Become Fictional:" Social Thought and Individual Development in "Flex Mentallo: Man of Muscle Mystery"

Lauren O'Connor, Andrew Schocket

American Culture Studies, Bowling Green State University

In Grant Morrison and Frank Quitely's 4-issue comic series "Flex Mentallo: Man of Muscle Mystery," author and artist weave together a complex story designed to trace the changes in style, affect, and theme which American superhero comics have undergone since their introduction in 1938. However, this research will demonstrate that Morrison and Quitely also dig deeper to expose the patterns of critical social thought throughout the twentieth century which heavily impacted the creators of superhero comics. A third layer of "Flex Mentallo" illuminates a parallel between this progression of key critical theories and individual development, concluding with a comparison between a stunting, consuming version of post-modern malaise and the throes of adolescent self-consciousness and anxiety. This research explores Morrison's remedies, as prescribed in "Flex Mentallo," for integrating self with society and overcoming the post-modern condition.

Time- 2:10-2:30 pm, Location- Field House Auditorium Room 2250

59. A Novel Glutamine Transporter Inhibitor: Delta Tocotrienol (T3) Inhibit Glutamine Transporters by Modulating Glutamine Uptake and Mtor Pathway in Non-Small Cell Lung Cancer (NSCLC) Cells.

Lichchavi Rajasinghe, Smi Gupta

Nutrition and Food Science, Wayne State University

Lung cancer, with the majority of cases being NSCLC, is one of the leading causes of death among cancers. The main energy source of NSCLC is glutamine and, it has exhibited high rate of glutamine dependency during its growth and development. Therefore, targeting glutamine transporters are shown to be a key drug targets with potential pharmacological importance. Cells were cultured with/without T3 and, the endometabolome of the cells was determined by ¹H-NMR spectroscopy. Changes in specific metabolite concentrations upon intervention with δ T were quantified. Inhibition of SLC7A5 glutamine transporter and its regulatory pathway (mTOR) was validated using western blot and RT-PCR. Results indicate that δ T inhibits the glutamine transporters and uptake via down regulation of mTOR1 pathway and, it resulted in dose dependent inhibition of cell proliferation and induction of apoptosis. This warrants further investigation of δ T as a potential natural therapeutic approach to prevent lung cancer.

Time- 2:10-2:30 pm, Location- Field House Auditorium Room 2220

60. Fear Moderates the Relationship between Features of Line Graphs and Perceptions of Health Risk

Lindsay Roberts, Jason Rose

Psychology, University of Toledo

Health risk information is frequently presented via line graphs, and the graph's slope can communicate specific information. Emotions also reliably influence the processing of threatening stimuli; specifically, processing threatening information while afraid results in heightened perceptions of personal risk. However, little research has tested whether systematically varying the slope of a line graph impacts health risk perceptions. Will linear vs. non-linear slopes produce the same patterns? Furthermore, is this effect moderated by the emotional state of the perceiver? This study employed a 2 (Affect: Afraid, Calm) X 4 (Slope: Linear, Non-linear early growth, Non-linear late growth, Stable) design in the context of considering a fictional illness. Results showed an Affect X Slope interaction, such that the linear slope elicited greater risk perceptions when compared to the non-linear slopes, but this effect was far stronger for participants in the fearful condition. Implications and conclusions are discussed.

Time- 1:50-2:10 pm, Location- Field House Auditorium Room 2260

61. Parent Child Visitation: Application of Best Practice in Ohio

Lindsey Waller, Shay Bankston
Social Work, University of Toledo

Parent-child visitation is the primary intervention that child welfare agencies use for maintaining, supporting, and developing healthy parent-child relationships necessary for reunification. Much effort has gone into identifying and studying the best practices that inform parent-child visitation at a state and local level. Ohio is a state supervised, county administered system, and practices used to promote parent-child visitation are widely varying, with each county interpreting state policies regarding minimum visitation requirements. Sixty six county agencies responded to an online survey examining the ways in which their visitation practices and procedures are in line with “best practice”. Most agencies reported this first visit occurring less than 5 days of removal (89.2%) while best practice identifies these initial visits need to occur within 24 hours if possible. Visits occur more than once weekly in 31.8% of county agencies who responded and last at least two hours in 70.8% of agencies.

Time- 1:10-1:30 pm, Location- Field House Auditorium Room 1230

62. Glycogen Synthase Kinase 3 Maintains Mitotic Arrest By Regulating Mitotic Checkpoint Complex Levels

Maisha Rashid, Dr. William R. Taylor
Biological Sciences, University of Toledo

Multiple cell cycle checkpoints ensure genomic integrity during cell division. We discovered a novel role of glycogen synthase kinase 3 (GSK3) in the mitotic checkpoint. We observed that GSK3 inhibitors, SB 415286 (SB), RO-81220 (RO) and LiCl, inactivate the mitotic checkpoint induced by spindle toxins nocodazole or taxol, causing cells to prematurely exit mitosis. As well, a GSK3 truncation mutant, obtained via crispr/cas9 system and with a deleted GSK3 inhibitory region, shows an increased mitotic index in taxol. Spindle toxins cause mitotic arrest by inducing the assembly of the mitotic checkpoint complex (MCC), composed of BubR1, Bub3, Cdc20 and Mad2. GSK3 inhibitors decreased MCC formation induced by spindle toxins, indicating a potential regulatory mechanism of checkpoint override. Additional genetic experiments implicated the de-acetylase sirtuin2 downstream of GSK3 in its mitotic regulation.

Time- 11:25-11:45 am, Location- Field House Auditorium Room 2270

63. The Correlates of Information Security Compliance Behavior

Majed Rajab, Ali Eydgahi

Information Assurance, Eastern Michigan University

This paper tests a model based on Deterrence, Planned Behavior, Protection Motivation and Organization Theories to explain variation in information security compliance with policies among employees in organizations. Information security compliance has been the subject of extensive theoretical and empirical investigation across applied and social sciences. The investigation of the correlates of information security compliance suffers from selective theoretical testing, mis-specified models and measurement issues. Following a comprehensive literature review, the paper develops a through model based on all identified theories explaining information security compliance. It obtains a sample of students at a large Midwestern University and utilize Structural Equation Modelling to fit the model. Results indicate mixed support for proposed theories.

Time- 1:50-2:10 pm, Location- Field House Auditorium Room 1230

64. Exploring Political Conflicts in the Arab World

Malek Abduljaber, Kevin Deegan-Krause

Political Science, Wayne State University

The Arab Spring ushered a new era in the politics of the Arab World. This has been molded in the vivacious conflicting episodes between those who espouse Islamic ideologies and those calling for liberal/secular orders. The polarization thesis has gained much popularity in the hearts and minds of policy analysts, as well as trained experts on the region. Nevertheless, this thesis has not undergone rigorous empirical evaluation. This paper uses the Sixth Wave of the World Values Survey to generate the number, nature and associations of existing ideological conflicts in Algeria, Jordan and Morocco. The study finds mixed support for the polarization thesis. On the one hand, Islamic-secular conflicts are pronounced among the citizens of the Arab World. At the same time, other conflicts mainly, the Neo-liberal ideological dimension has been shaping the opinions of people on various political issues within the region.

Time- 10:25-10:45 am, Location- Field House Auditorium Room 2200

65. Coming Home: How Identity Plays a Role in Students Who Study Abroad in an Area Representative of Their Heritage.

Mariana Naddaf, Jennifer Palm

The Graduate School, Grand Valley State University

Studying abroad participation has more than tripled over the past two decades in the United States and has led to increased research efforts on topics such as the benefits of study abroad and the development of students who study abroad; however, little research exists on students who have heritage connections to the area in which they study abroad. In order to address this need within the field of higher education and study abroad, a hermeneutic phenomenological qualitative study will be used to explore what factors, if any, affect changes in identity salience for students who study abroad in areas that are representative of their heritage. Rather than focus on one aspect of identity (e.g., social, ethnic, racial, or nationality), this study will leave it up to the participants to disclose what pieces of their identity, if any, were affected by their individual study abroad experience. Identity salience in regards to ancestral connection will be a focus of this study. The theories that guide this study includes Bronfenbrenner's ecological theory and Abes, Jones, and McEwen's reconceptualized model of multiple dimensions of identity. This research will provide insight into this phenomenon by exploring the lived experiences of American students who studied abroad in an area connected to some part of their heritage. In addition, this research will embrace a holistic perspective of student development as a guiding philosophy throughout in order to represent the fluidity and intersectionality of identity.

Time- 11:05-11:25 am, Location- Field House Auditorium Room 2200

66. Identifying Land-Lake Linkages for Fish Communities in Nearshore Zones of Lake Erie

Martin Simonson, Dr. Chris Mayer

Environmental Sciences, University of Toledo

Approximately 80% of fishes from the Laurentian Great Lakes use the nearshore zone in some way (e.g., feeding, spawning, or nursery area) for at least part of the year. Extensive shoreline alteration and development along Ohio's Lake Erie coast has changed the connection between aquatic and terrestrial habitats. Therefore, we hypothesized that shoreline features such as the types of terrestrial vegetation and armoring may affect the nearshore fish community composition. In order to determine relationships between shoreline types and the nearshore fish community, terrestrial vegetation and shoreline structures were classified at sites in the western basin of Lake Erie where fish were sampled between 2011 and 2015. Indices of the nearshore fish community were compared to shoreline habitat classification, with highest fish abundance and diversity at complex, vegetated shorelines. The influence of coastal landscape characteristics on nearshore ecosystem services must be accounted for in urban planning of coastal communities.

Time- 10:25-10:45 am, Location- Field House Auditorium Room 2240

67. Genetic Patterns Across an Invasion's History: A Test of Change Vs. Stasis for the Eurasian Round Goby in North America

Matthew Snyder, Carol Stepien

Dept. of Environmental Sciences, University of Toledo

Biological invasions comprise accidental evolutionary experiments, whose genetic compositions underlie their relative success. Theory predicts that most would undergo founder effect, exhibit low genetic divergence across the new range, and gain variation over time. To test these predictions, we analyze population genetic diversity and divergence patterns of the Eurasian round goby *Neogobius melanostomus* across the two decades of its invasion in the Laurentian Great Lakes. We compare temporal genetic patterns at the invasion's core and expansion sites, in comparison to its primary native source population in the Dnieper River, Black Sea. Results reveal pronounced genetic divergence across the invasion's range, with population areas remaining genetically distinct and statistically consistent across two decades. The original genotypes continue to predominate. The original invasion core has remained the most similar to the native source. Expansion sites show slight allelic composition convergence towards the core population over time, attributable to some early allelic gains.

Time- 2:10-2:30 pm, Location- Field House Auditorium Room 2270

68. Dormant VHSV Fish Virus Found Mutating in Lake Erie

Megan Niner, Carol Stepien

Environmental Sciences, University of Toledo

With >80 freshwater and marine fish species susceptible, the Viral Hemorrhagic Septicemia virus (VHSV) is of serious concern worldwide. In the Great Lakes, VHSV-IVb is a new, novel, and virulent substrain unique to the region. The virus emerged in 2003 and rapidly spread, causing massive fish kills in 2006. With no recent outbreaks, it appears the virus has "gone dormant". Sampling prior to this study showed the virus persists in Great Lakes fishes. In 2015, we sampled all five Great Lakes and recovered two VHSV-positive, asymptomatic fishes, a round goby and a white perch, from central Lake Erie. Dreissenid mussels were also tested for VHSV-IVb. Genetic changes in VHSV appear to have followed the large 2006 outbreak, possibly an evolutionary response to fish populations developing resistance. Rapid evolutionary diversification may allow new variants to evade host recognition and immune responses, facilitating long-time persistence and expansion to new geographic areas.

Time- 11:05-11:25 am, Location- Field House Auditorium Room 2240

69. Application of the New Ecological Paradigm Survey to an Environmental Science Course

Mike Mathis, Daryl Moorhead

Department of Environmental Science, The University of Toledo

The New Ecological Paradigm (NEP) survey was developed to understand people's perspectives on environmental topics. We applied it at the start and finish of 14 sections of EEES 1130 (environmental science) classes from Spring 2014 to Fall 2015 to determine if environmental beliefs were related to student performance. Results showed a modest but significant increase ($N=1030$, $P\leq 0.01$) in NEP scores (becoming slightly more environmentally oriented) by the end of class, and a significant negative correlation ($r = -0.25$, $P\leq 0.01$) between the initial score and increase in scores, i.e., students entering with a high score generally had smaller increases. No correlation was found between the change in score and student's college, major, service learning participation, or course attendance. Additional analyses may provide insights to how the individual conceptual themes of the NEP survey were related to student scores.

Time- 10:45-11:05 am, Location- Field House Auditorium Room 2230

70. Melt-Out Time Lag, and Its Impact on Assessing Ages of Quaternary Events

Mitchell Dziekan, Timothy Fisher

Environmental Sciences, University of Toledo

The radiocarbon dating of basal sediment from kettle lakes is a common method used for assigning ages to deglacial events. Studies frequently have inferred a 1,000 – 5,000 year lag between ice retreat and organic accumulation in kettle lakes to allow for pedogenesis, plant succession, and permafrost thaw. However, recent studies suggest time lags can vary dramatically due to differences in the extent of permafrost, water drainage, and burial conditions of ice. Basal radiocarbon ages associated with the Sturgis Moraine, MI, a product of the Laurentide Ice Sheet, are assigned a melt-out lag of ~2,000 years. This time lag is unexplained and poorly constrained. Therefore, new ages from radiocarbon and OSL dating, and stratigraphic analysis of lake cores is need to uncover patterns between ages, sedimentology, and environmental proxies that would better constrain this melt-out lag – leading to a more accurate age assignment for the Sturgis Moraine and other deglacial events.

Time- 10:25-10:45 am, Location- Field House Auditorium Room 1230

71. Strategic Policy Narratives in Higher Education

Monica Hatfield Price, Dr. Laura Harrison
Higher Education, Ohio University

Policy making in higher education is highly consequential. As such, scholars need to consider how opposing policy advocates strategically craft narratives to advantage their side of a policy issue. This presentation describes results of a study exploring how Ohio policy makers, higher education newspapers, and prominent advocacy groups strategically create narratives to influence growth of prior learning assessment (PLA). PLA is the educational practice of awarding college credit for learning that occurred outside the college classroom. Results suggest PLA policy narratives do not typically include the voices of diverse democratic participants. Also, findings of asymmetry and bias in PLA policy narratives are discussed. This study contributes to understanding narratives in the policy process and can improve the practical work of higher education lobbyists, policy makers, and educators.

Time- 10:25-10:45 am, Location- Field House Auditorium Room 2230

72. Analyzing the Effect of the Fenestration Systems on Energy Consumption in High Rise Buildings in Saudi Arabia

Nadia Arafah, Shinming Shuy
Interior Design, Eastern Michigan Univeristy

Saudi Arabia tends to prefer the Western style in having a building envelope façade which appears clearly in the glazed façade, regardless of the fact that those designs are not compatible with the climate of the country. Therefore, this Western approach involving the fenestration system is causing massive consumption of energy in cooling the buildings, and in achieving the thermal comfort for the occupants. The default approach for the occupants in buildings with glazed facades is turn on the HVAC unit to overcome the heat gain coming from the windows, which leads to higher electrical bills and the waste of non-renewable resources. This research proposal will analyze The effect of modifying the window properties (U-factor, wall-window ratio area, solar heat gain Coefficient (SHGC) and the window orientation) in the fenestration system on the energy bills spent on the cooling in high rise commercial buildings in Saudi Arabia.

Time- 1:10-1:30 pm, Location- Field House Auditorium Room 2250

73. Colloidal Synthesis of Monodisperse Semiconductor Nanocrystals through the Saturated Ionic Layer Adsorption

Natalia Razgoniaeva, Mikhail Zamkov

Physics and Astronomy, Bowling Green State University

We demonstrate a general strategy for the synthesis of colloidal semiconductor nanocrystals (NCs) exhibiting the size dispersion below 5%. The present approach relies on the sequential deposition of fully saturated cationic and anionic monolayers onto small-diameter clusters, which leads to focusing of nanocrystal sizes with the increasing particle diameter. Each ionic layer is grown through a room-temperature colloidal atomic layer deposition (ALD) process that employs a two-solvent mixture to separate the precursor and nanocrystal phases. As a result, unreacted precursors can be fully removed after each deposition cycle, preventing the secondary nucleation. By using CdS NCs as a model system, we demonstrated that a narrow size dispersion can be achieved through a sequential deposition of fully-saturated Cd²⁺ and S²⁻ half-monolayers onto starting CdS cluster “seeds”. In addition to a narrow distribution of nanoparticle sizes, the demonstrated methodology offers an excellent batch-to-batch reproducibility and an improved control over the nanocrystal surface stoichiometry. The present synthesis is readily amenable to other types of semiconductor nanocrystals and is expected to offer a viable alternative to traditional hot-injection strategies of the nanoparticle growth.

Time- 10:05-10:25 am, Location- Field House Auditorium Room 2250

74. Ground-Truthing a High-Throughput Sequencing Assay for Invasive Dreissena Detection Using Simulated Communities

Nathaniel Marshall, Carol Stepien

Environmental Sciences, University of Toledo

The Great Lakes are one of the most invaded aquatic habitats, numbering 186 invasive species, including the notorious dreissenid mussels (zebra and quagga). Detecting invasive species prior to establishment and at all life stages greatly increases chances of eradication and control. Environmental (e)DNA (i.e., genetic material shed from living organisms via urine, mucus, tissues, filter feeding, etc.) is a powerful technique to assess the presence/absence of invasive and/or rare species, which is especially effective at low population levels compared to traditional sampling. However, most eDNA assays just reveal single species presence/absence, lacking information about relative abundances and genetic diversity. We developed and tested a rapid high-resolution diagnostic assay to identify and evaluate the relative proportions of dreissenid taxa within North American invasive communities. The accuracy of the assay was evaluated with simulated communities of known DNA concentrations, to reveal the composition, diversity, and relative abundances of component taxa.

Time- 2:50-3:10 pm, Location- Field House Auditorium Room 2240

75. Textual Japan

Nicholas Hansford, Mary Ben Bonham
College of Creative Arts, Miami University

Japanese architecture is grown from the idea that a building fits in nature and provides a place for man to be completely wrapped in nature by structures through material. The paper introduces Oya Stone, a natural material known only to parts of Japan, its properties and uses in Japanese architecture. The stone is a materialization of culture through architecture that connects place to tradition and the present on a physical and metaphysical level. Tradition in Japanese architecture comes in the material and its connection to “textual” space, defined by Arata Isozaki in “Japan-ness in Architecture” as a space connected to an external context, sociohistorical space, and visual and verbal interaction. Through the analysis of Oya stone in Frank Lloyd Wright’s New Imperial Hotel (Tokyo, 1922), and Japanese architect Kengo Kuma’s Chokkura Plaza (Tochigi Prefecture, 2006). With a reflection of the poetics of the traditional stone as applied in Chokkura Plaza’s adaptive reuse of a rice storehouse; it becomes apparent that the material plays a significant role in creating a “textual” space. Japanese architecture becomes a “textual” space that embodies the qualities of simplicity, humility, purity, and lightness.

Time- 1:30-1:50 pm, Location- Field House Auditorium Room 2250

76. Non-Invasive Skin Cancer Detection and Diagnosis

Nikhil Dhinagar, Mehmet Celenk
School of Electrical Engineering and Computer Science, Ohio University

It is imperative to detect skin cancer at an early stage to ensure an effective medical treatment. Traditionally skin lesions were examined visually by a dermatologist followed up by an invasive biopsy. Studies have shown that 90% of these biopsies are false positives. This work proposes a non-invasive diagnostic alternate as the first line of defense. With computer vision and artificial intelligence techniques, digital skin image information of diagnostic importance can be analyzed to make a more informed decision in real time. This research proposes software algorithmic capability to detect changes of a lesion on the skin over a period of time in conjunction with existing high resolution imaging. Variation of skin features such as the vascularity and pigmentation measures are tracked and quantified from surface and histopathological cross-sectional skin images.

Time- 11:25-11:45 am, Location- Field House Auditorium Room 2220

77. The RNA Paradox: Can Small RNA Increase Gene Expression?

Nikita Deshpande, Victoria Meller
Biological Sciences, Wayne State University

Dosage compensation equalizes X-linked gene expression between males and females. X-linked genes in *Drosophila melanogaster* males are transcribed at twice the rate as females. This is accomplished by the Male Specific Lethal (MSL) complex, which binds the X, modifies chromatin and increases expression. The siRNA pathway contributes to X-localization of the MSL complex, but no RNAi components directly interact with the MSL complex. This suggests that the siRNA pathway acts through a novel and indirect mechanism. For example, an Ago2-containing complex could bind nascent RNAs from the X chromosome and recruit activities that alter epigenetic marks or chromatin architecture. This might facilitate MSL recruitment and spreading along the X-chromosome. In support of this idea, I found that proteins interacting with Ago2 influence epigenetic marks on X chromatin and participate in dosage compensation. This is a useful model for coordinated regulation of broad chromosomal regions in eukaryotes.

Time- 10:25-10:45 am, Location- Field House Auditorium Room 2270

78. In Vivo Expression of Helix 69 Binding Peptides in Bacteria

Nisansala Muthunayake, Christine Chow
Chemistry, Wayne State University

The specific region of the bacterial ribosome under investigation in this study is helix 69 (H69). Considering the variety of functions of H69 in protein biosynthesis, it is identified as an attractive antibacterial drug target. In a previous study, short peptides that specifically bind to H69 were isolated by using phage-display libraries. The objective of the current study was to investigate the inhibitory effects of these H69-targeting peptides on protein synthesis in bacteria. In order to determine their inhibitory activity, minimum inhibitory experiments were carried out with *E. coli* MRE 600 and *lpxA* strains. Our preliminary results showed inhibition of protein translation in the presence of peptides alone and in combination with other small molecules; however, it was clear that the peptides have cell penetration problems. Therefore, H69-targeting peptides were expressed in vivo as GFP-fusion proteins and their activities were monitored through cellular fluorescence levels. Expression of two different peptides was shown to have an inhibitory effect on bacterial cell growth. These findings will be helpful for future antimicrobial drug development.

Time- 1:30-1:50 pm, Location- Field House Auditorium Room 2210

79. Ohio College Credit Plus: A Policy Analysis of Two Central Ohio Public High Schools in the First Year of Implementation

Pamela Wilson, Lijing Yang
Counseling and Higher Education, Ohio University

The purpose of this research study was to develop a descriptive first-year profile of the implementation of Ohio's College Credit Plus policy for two central Ohio high schools. This policy implementation analysis employed a multi-pronged approach using case study and policy implementation evaluation framework. Document review and administrative interviews provided the primary data sources.

Several overarching themes surfaced. Confusion regarding the regulations exacerbated inconsistent application and compliance across institutions. No explicit process is defined for assessing or reporting on compliance. Additional inconsistency is evident in program offerings based on district cultures, location, and size. While some critical barriers to access have been removed, student support systems and counseling services have not been increased to assist those students that may need additional guidance in understanding alternative program offerings. Those students most in need of these opportunities may be negatively impacted

Time- 2:10-2:30 pm, Location- Field House Auditorium Room 2230

80. International Student-Academic Adviser Interactions: A Communications Audit and Recommendations for Effectiveness

Pearl Mohankumar, Deborah Davis
Journalism, Ball State University

The rapid advances in transportation and the instantaneity in communication have increased the need for international and intercultural understanding, adding to the urgent priority to internationalize higher education. One of the methods through which higher educational institutions internationalize is by receiving international students. The efforts of institutions to attract top academic talent in the world is an indication of competitiveness in internationalizing universities. Since the international student population has been established as one of the key publics of the university, it is necessary to establish effective, strategic communications to build student/advisor relationships. This study posited that the communication behaviors between international students and university personnel, as constructs of organization-public relationships, will create favorable outcomes on the university reputation. This study examined the communication patterns of international students with university personnel and provided recommendations and a communications plan to enhance university reputation among international graduate students and influence their WOM intentions.

Time- 9:45-10:05 am, Location- Field House Auditorium Room 2230

81. Aspartate N-Acetyltransferase: A Critical Enzyme in Brain Metabolism

Qinzhe Wang, Ronald Viola

Chemistry and Biochemistry, The University of Toledo

Canavan disease (CD) is a neurological disorder caused by an interruption in the metabolism of N-acetylaspartate (NAA). Numerous mutations have been found in the enzyme that hydrolyzes NAA, and the catalytic activity of aspartoacylase is significantly impaired in CD patients. Recent studies have also supported an important role in CD for the enzyme that catalyzes the synthesis of NAA in the brain. However, previous attempts to study this enzyme had not succeeded in obtaining a soluble, stable and active form of this membrane-associated protein. We have now utilized fusion constructs with solubilizing protein partners to obtain an active and soluble form of aspartate N-acetyltransferase. Characterization of the properties of this enzyme has set the stage for the development of selective inhibitors that can lower the elevated levels of NAA that are observed in CD patients and potentially serve as a new treatment therapy.

Time- 11:05-11:25 am, Location- Field House Auditorium Room 2270

82. Interactive Effects of Invertebrate Detritivores and Litter Quality on Decomposition

Robby Baroudi, Shannon Pelini

Biological Sciences, Bowling Green State University

Disturbance in patches of Northern hardwood forests by periodic burns can lead to sequences of succession in which microbial and soil/litter dwelling invertebrate communities may vary in response to changes in tree and plant communities. The presence of many invertebrates, in particular detritivores, can drastically alter leaf decomposition as they make leaf material more readily available to microbes, which may result in varying decomposition rates depending on the stage of succession. This is significant as heterotrophic respiration during decomposition is a major input of carbon dioxide into the atmosphere, and the effects of invertebrates are often overlooked. We predict that older growth forests will have better litter quality and increased richness/abundance of detritivores, leading to increased decomposition.

Time- 2:30-2:50 pm, Location- Field House Auditorium Room 2270

83. Effect of Conservation Practices on Agricultural Nutrient Loss

Stephanie Nummer, Song Qian

Environmental Science, University of Toledo

The impact of nitrogen and phosphorus runoff from agricultural lands on water quality is important in the United States, due to harmful algal blooms and anoxic zones in areas such as Lake Erie. Conservation practices are used to reduce nutrients leaving a field, but there is a lack of research on the effectiveness of them. Our goal is to quantify the effect of conservation practices on nutrient loss in farmlands. A meta-analysis was conducted using the Measured Annual Nutrient loads from Agricultural Environments (MANAGE) database created by the USDA-ARS, which includes field characteristics. The observational nature of the data makes direct comparisons from field to field unreliable. To achieve our goal we used propensity scores and multilevel modeling, methods common for observational data. Propensity score matching shows that conservation practices reduce total phosphorus by 67.5%, particulate phosphorus by 83%, and particulate nitrogen by 67.3%. Multilevel modeling results support these findings.

Time- 2:30-2:50 pm, Location- Field House Auditorium Room 2200

84. Nucleation and Growth Mechanisms of Methylammonium Lead Iodide Perovskites in the Two-Step Solution Process

Suneth Watthage, Michael Heben

Physics, University of Toledo

Organic-inorganic hybrid lead halide perovskites have shown a remarkable improvement in the device performance in recent years up to 22 % power conversion efficiency (PCE). Among the different deposition methods, two-step solution-based deposition provides an easy and low-cost route to prepare uniform and full-coverage perovskite thin films. Understanding the mechanism of film formation in the two-step solution process is essential to control the crystal growth and film quality to further enhance device performance. In this study, nucleation and growth mechanisms of methylammonium lead iodide perovskite (MAPbI₃) formed in a two-step solution process were investigated. MAPbI₃ films were formed by reacting the pre-deposited lead iodide (PbI₂) films with various concentrations of methylammonium iodide (MAI) in isopropanol solution. As the MAI concentration increases, three different perovskite formation behaviors were observed and a tentative model is proposed to explain these reaction mechanisms. Ostwald ripening, the blocking layer formation, and the low-dimensional perovskite assisted diffusion were identified as the main three mechanisms of film formation in the two-step solution based deposition method.

Time- 10:45-11:05 am, Location- Field House Auditorium Room 2210

85. Investigation of non-Thermal Atmospheric Pressure Plasma Treatment Effects on Lung Cancer Cells in 3D Collagen Model

Surya Karki, Halim Ayan
Bioengineering, University of Toledo

Non-thermal Atmospheric Pressure (NAP) plasma has been emerged as a novel technology for various medical application like sterilization, wound healing and oncological applications. Many researchers are studying cancerous cells in traditional two dimensional (2D) monolayer cell culture; however three-dimensional (3D) models are more realistic alternatives as they can mimic the native in vivo environment of tumor cells. In this study, we used 3D collagen constructs to study the apoptotic and penetrating effect of plasma. 3D collagen samples, which encapsulate lung cancer cells, were treated with plasma for 15, 30, 60 and 120 sec treatment time and were run for flow cytometry for apoptosis analysis. Results showed that plasma is more effective to induce apoptosis in lung cancer cells. Furthermore, confocal microscopy results demonstrated that plasma-induced apoptosis in lung cancer cells goes as deep as 500 μ m. These results suggest the promising application of NAP plasma for lung cancer cells therapy.

Time- 1:50-2:10 pm, Location- Field House Auditorium Room 2220

86. Review of Research on Cognitive Load in Mobile Learning Environments

Talal Alasmari, Dr. Timothy Spannaus
Instructional Technology, Wayne State University

Mobile learning becomes more widely accepted by educational institutions and that brings more challenges to the educational practices compared to the conventional practices. Cognitive load in mobile learning is one of the challenges where the physical limitations decrease and the information sources increase. A review of the current research in cognitive load with mobile learning was provided in this study taking into account common subject domains, research methods, data collection method, and used technologies. Science and social science are the most studied subjects when investigating cognitive loads with mobile learning and personal digital assistants (PDA) is the popular technology. Cognitive loads have significantly decreased in many studies and subjective measurements are the most used measures for cognitive load. Recommendations for future studies have been provided.

Time- 10:05-10:25 am, Location- Field House Auditorium Room 2230

87. CRISPR/Cas9 Mechanism May be Used to Identify Previously Uncharacterized Mitotic Genes

Taylor Monus, William Taylor
Biological Sciences, University of Toledo

Genome-wide RNAi and proteomic screens in human cells and tissues have identified potentially novel cell division regulatory genes that have yet to be fully analyzed. Due to various limitations of these screens, independent methods of validation are needed. By combing through these screens we were able to identify 12 potential cell cycle and mitosis related genes. In order to validate these results we utilized the CRISPR/Cas9 mechanism to knock them out of the genome in hopes that they show a mitotic phenotype. The CRISPR/Cas9 system creates a double strand break at a user-defined site in the genome. Non-Homologous End Joining (NHEJ) at these sites will potentially lead to the inappropriate addition or subtraction of a nucleotide. This may create a frameshift mutation within the gene of interest. Upon validation of a candidate we also plan to determine subcellular localization of their protein products and possible interacting proteins.

Time- 2:10-2:30 pm, Location- Field House Auditorium Room 2240

88. Assessing Accuracy of a Plant-Microbe Resource-Exchange Model

Teresa Clark, Yair Shachar-Hill
Plant Biology, Michigan State University

Plants participate in resource-exchange mutualisms with microbes to trade carbon for relatively scarcer nutrients such as phosphorus and nitrogen. Many biological market models have been developed to predict the carbon-nutrient exchange ratio to assess the benefit the plant receives from engaging in trade. One model was developed by Grman et al. (2012) to model carbon-phosphorus trade in the grass-mycorrhizae fungi model using ranges of literature values for the model parameters and predictions. We adapted this model to carbon-nitrogen trade in the legume-rhizobia bacteria mutualism. However, it is unclear whether universal ecological models can make predictions accurate enough to be used as proxies in molecular-based studies. To test this, we performed a series of physiological and labeling experiments with *Medicago truncatula* and rhizobia across four soil nitrogen levels (representing high to low benefit from trade). We measured model parameters and predictions, and evaluated model accuracy by generating statistical confidence intervals.

Time- 2:10-2:30 pm, Location- Field House Auditorium Room 2210

89. A Novel Bi-Level Meta-Analysis Approach - Applied to Biological Pathway Analysis

Tin Nguyen, Draghici Sorin
Computer Science, Wayne State University

The accumulation of high-throughput data in public repositories creates a pressing need for integrative analysis of multiple datasets from independent experiments. We propose a novel bi-level meta-analysis approach that employs a Central Limit Theorem approach within each individual experiment and also across multiple experiments. We prove that the bi-level framework is robust against bias, less sensitive to outliers than other methods, and more sensitive to small changes in signal. For comparative analysis, we demonstrate that the intra-experiment analysis has more power than the equivalent statistical test performed on a single large experiment. For pathway analysis, we compare the proposed framework versus existing meta-analysis approaches, using 1,252 samples related to three human diseases, acute myeloid leukemia, type II diabetes, and Alzheimer's disease. Our framework outperforms its competitors to correctly identify pathways relevant to the phenotypes. The framework is sufficiently general to be applied to any type of statistical meta-analysis.

Time- 1:10-1:30 pm, Location- Field House Auditorium Room 2240

90. Antimicrobial Effectiveness of Floating Electrode Dielectric Barrier Discharge Plasma (FE-DBD) and Jet DBD Plasma on the Viability of Pseudomonas Aeruginosa

Tripti Thapa Gupta, Halim Ayan
Bioengineering, University of Toledo

Contamination of medical implant by planktonic or biofilm growth is a major cause of illness in patients and is therefore increasing healthcare costs due to extended hospital stays and the failure/disposal of contaminated implants. Only limited progress has been made to eradicate this problem. We propose to employ non-thermal FE-DBD and jet plasma to kill bacteria that have been grown planktonically or in biofilms. In this study, *Pseudomonas aeruginosa* was grown on titanium surface in a bioreactor under dynamic conditions in order to form biofilms. The biofilms were exposed to FE-DBD and jet plasma and bacterial survival was evaluated after treatment for various times. Also planktonic bacteria were treated on the agar plate at various treatment time. Within 15 minutes of plasma treatment, we observed decontamination of planktonically grown bacteria and 3 log reduction (99.9%) in bacteria grown as biofilms.

Time- 10:05-10:25 am, Location- Field House Auditorium Room 2260

91. Internationalization of U.S. Higher Education: A Critical Review

Vijay Paralkar, Joel Malin

Educational Leadership, Miami University Oxford Ohio

Higher education in the United States (U.S.) is increasingly internationalizing. Nearly one million international students were enrolled in U.S. universities in the 2014-15 school year, contributing more than \$30.5 billion to the U.S. economy (Altbach, 2015). The internationalization of education also includes transnational education establishing offshore and branch campuses in other countries and collaborative degree programs abroad. While there are obvious benefits to exposing American students to global cultures and perspectives and to the economy, these trends raise important questions. For instance, are international students displacing local students in U.S. higher education institutions? Also, how might U.S. universities capitalize on the trend of internationalization without compromising the education of domestic students? As such, I conduct a critical review of literature regarding the internationalization of U.S. higher education. On the basis of this review, I present implications for higher education policy and practice.

Time- 1:10-1:30 pm, Location- Field House Auditorium Room 2230

92. Design and Synthesis of Inhibitors Against Aspartate N-Acetyl Transferase – A Novel Approach to Treat Canavan Disease.

Vinay Mutthamsetty, Ronald E. Viola

Chemistry and Biochemistry, university of toledo

Canavan disease (CD), a fatal neurological disorder observed in infants, is caused by an inherited genetic deformity. CD is a leukodystrophy, causing disruption in the growth and maintenance of myelin sheath (responsible for efficient transmission of nerve impulses). Therefore, infants affected with CD lack in developing motor skills and speech, also, they usually include conditions like hypotonia and macrocephaly. This neurological disorder is caused due to multiple mutations in the aspa gene that codes for aspartoacylase, an enzyme responsible for catalyzing the conversion of N-acetyl-L-aspartate (NAA) to L-aspartic acid and acetate (an important chemical in biosynthesis of myelin sheaths). Our current work is focused on the synthesis of potent inhibitors against ANAT. In addition to the screening amino acids, metabolites, and constrained analog libraries, we also synthesized 105 dioic acid and phthalate analogs, out of which we achieved a 50% hit rate of modest enzyme inhibitors. We then systematically optimized the structure of dioic acid derivatives to obtain more potent inhibitors with the best compounds having K_i values in the low micro molar range. We also synthesized constrained phthalate compounds and established a correlation among different aryl substitutions. As an alternative approach several bisubstrate analogs were synthesized which exhibits extremely high affinity towards ANAT. An in-depth study of the electronic interactions between these bisubstrate analogs and the enzyme will allow us to understand and design new potent inhibitors which can be further developed in to selective drug candidates to treat Canavan disease. This work was supported by funding from Turing Pharmaceuticals.

Time- 11:05-11:25 am, Location- Field House Auditorium Room 2260

93. The Relative Price of Racial Group Membership: Justice Restoration in the Third-Party Modified Ultimatum Game

Wen Qu, Jennifer Kubota
Psychology, University of Chicago

Restoring justice through judicial decisions is commonly assumed to be just, yet recent events in the US have sparked heated debates regarding the tension among different racial groups, where racial effects on judicial decisions have been increasingly discussed. To explore how race affects justice restoration on behalf of “victims”, participants were third-party decision-makers who viewed judgements from an Ultimatum Game where a first player (the proposer) determines how to split an endowment. We broadened the available response options from simply accepting and rejecting to include compensatory motions for restoring justice where individuals can reward individuals when they have received unfair offers (FeldmanHall et al., 2014). For this third-party modified ultimatum game, participants responded to fairness violations for their self, an ingroup member, and an outgroup member. We hypothesized that individuals compensated more on behalf of Black victims, and punished more when acting as a White victim.

Time- 2:10-2:30 pm, Location- Field House Auditorium Room 1230

94. Catalytic Conversion of Vegetable oil to Fuels and Chemicals

Yaser Shirazi, Sridhar Viamajala
Chemical and Environmental Engineering, University of Toledo

In this study, catalytic cracking of soybean oil was carried out in a continuous pyrolysis system with feed injected through an atomizer. This allowed introduction of micron-sized droplets of oil that could be rapidly vaporized inside the hot reactor. With this novel design, we were able to achieve short vapor residence times (optimum τ_{vap} was 20s in order to achieve high liquid products and triglyceride conversion) without use of carrier gas, which would significantly reduce the overall cost of pyrolysis. Effects of reaction temperature ($450 < T_{\text{rxn}} < 500$ °C) and catalyst loading (HZSM-5; 0-5g) on conversion, product yields and composition were investigated. At $T_{\text{rxn}} = 500$ °C and without catalyst, nearly quantitative conversion of feed was achieved and the yield of pyrolysis liquids was as high as 89% (relative to feed mass). Under these conditions, the identified products consisted of 37% hydrocarbons (C5-C17), 35% long-chain fatty acids (C16-C18, but primarily oleic acid) and 10% short-chain fatty acids (C6-C12). At $T_{\text{rxn}} = 500$ °C using 5g of HZSM-5, the yield of liquid products was 65%. The identified liquid products contained 73% aromatics (C6-C12, but primarily benzene, toluene and xylene), 5% aliphatic and only 4% long-chain fatty acids. Overall, our results demonstrate the feasibility of producing liquid products at high yields, including a wide range of fuels (gasoline, jet and diesel) and enriched oleic acid (for oleochemicals production) with integration of conventional downstream separations, such as distillation.

Time- 10:05-10:25 am, Location- Field House Auditorium Room 2210

95. GIS & Location Based Services in the Field of Transportation

Yassir Elrayah, Xie Yichun

GIS, Eastern Michigan University

Solutions around GIS and Location based services (LBS) increased dramatically during the past few years. Currently many web and mobile applications utilize GIS and LBS in many ways from navigation to locating points of interest around us. Therefore, this technology is well integrated in our daily life. In the field of transportation, with the emerging of autonomous and semi-autonomous vehicles, GIS and LBS once again play a big role on the success of this technology. In this presentation, LBS will be discussed in terms of its framework, infrastructure as well as current and future solutions to our transportation systems.

Time- 2:50-3:10 pm, Location- Field House Auditorium Room 1230

96. Protease-Containing Membranes for Rapid Antibody Digestion Prior to Mass Spectrometry Analysis

Yongle Pang, Merlin Bruening

Chemistry, Michigan State University

Monoclonal antibodies have emerged as important biotherapeutic drugs. Facile characterization of mAb post-translational modifications is essential for quality control, and mass spectrometry is the most powerful tool for antibody characterization. This research uses pepsin-modified membranes as proteolysis reactors that rapidly (<1 min) digest mAbs prior to MS analysis. Peptic digestion is convenient because the acidic conditions enable antibody proteolysis without denaturation and alkylation. After antibody reduction with TCEP under acidic conditions, passage of the antibody-containing solution through a pepsin-containing membrane yields peptides whose length depends on the flow rate through the membrane. Variation of the residence time (3-sec to 3-msec) of reduced-antibody solutions in the membrane yields bottom-up (1-2 kDa) to middle-down sized peptides (5-15 kDa) for both the light and heavy chains, and these peptides cover the entire antibody sequence. With minimal preparation time, membrane digestion leads to high peptide and sequence coverages for identification of PTMs by MS.

Time- 2:30-2:50 pm, Location- Field House Auditorium Room 2210

97. Is the More Intergroup Contact the Better the Outgroup Evaluation Across Groups and Cultures?

Yopina Pertiwi, Andrew Geers
Psychology, University of Toledo

The study examined the role of direct and extended contact in predicting prejudice between majority and minority groups in two cultures. A total of 75 White Americans (majority-US), 44 Chinese Americans (minority-US), 61 Javanese Indonesians (majority-Indonesia), and 72 Chinese Indonesians (minority-Indonesia) completed an outgroup feeling thermometer and a set of items assessing direct contact and extended contact with outgroup members in each cultural setting. Results revealed a three-way interaction effect of direct contact, group status, and culture in predicting prejudice. Specifically, Javanese and Chinese American participants showed more favorable attitudes towards outgroups when direct contact was high; whereas an opposite trend was found for White Americans. A three-way interaction effect of extended contact, group status, and culture was also found in predicting prejudice with similar trend. Yet, none of the slopes were significant. The nature of relationship between majority and minority groups in each cultural setting may explain these findings.

Time- 2:10-2:30 pm, Location- Field House Auditorium Room 2260

98. Factors Affecting Chitosan/Tripolyphosphate Micro- and Nanogel Yield and Their Two Critical Effects on Protein Uptake

Yuhang Cai, Yakov Lapitsky
Chemical Engineering, University of Toledo

Chitosan/tripolyphosphate (TPP) micro- and nanogels are widely studied as potential vehicles for ocular and intranasal drug delivery due to their biocompatibility, mild formation conditions and mucoadhesive properties. Yet, optimizations of loading protein into chitosan/TPP nanogels still under trial and error, which mainly due to a lack of clear understanding of protein uptake mechanism. Here, we hypothesized that the association efficiencies (AE) of protein loading were affected by two key factors: (1) interaction between protein and chitosan/TPP particles; (2) fraction of chitosan that aggregate into particles (i.e., particle yield, XAgg). Consistent with our hypothesis, the AE-value was very sensitive to factors that affect interaction between protein and particles using BSA and α -LA as model proteins. AE scaled linearly with the XAgg until all chitosan was aggregated into particles. This may reflect an equilibrium partitioning of drug in supernatant phase and solid particle phase, and was confirmed with binding isotherm model.

Time- 11:25-11:45 am, Location- Field House Auditorium Room 2260

99. An iLBP Family Member Domain Swapped Dimer is evidence for a highly ordered folding intermediate

Zahra Assar, James H. Geiger
Chemistry, Michigan State University

Human Cellular Retinol Binding Protein II (hCRBP_{II}), a member of the intracellular Lipid binding protein (iLBP) family, is a monomeric protein responsible for the intracellular transport of retinol and retinal. Previous studies on other proteins of this family have shown that they fold into monomers. However we report, for the first time, that wild-type hCRBP_{II} gives rise to an extensive domain swapped dimer (almost 50% of the protein sequence) during bacterial expression. In addition, there is no evidence of interconversion between monomer and dimer even after weeks of incubation, suggesting that two non-interconverting folds can result from the same amino acid sequence. The propensity for dimerization can be increased via mutation at Tyr60. Structural studies of these dimers suggest that an “open monomer” folding intermediate gives rise to both monomer and dimer, and their ratio depends on the relative orientation of two halves of the protein in open monomer intermedia

Time- 10:05-10:25 am, Location- Field House Auditorium Room 2270

100. From Rhetoric to Community Action: Quest for Integrated Multicultural Education

Colins Imoh
Education, University of Toledo

Society is not static but in a state flux, with its dynamics constantly altering. It would be an illusion to expect it to remain the same over time. It is the same with culture. Multicultural education movement is the natural progression and integration of the work of intercultural and intergroup education. Therefore as immigrants arrive in the USA, they come with their own culture, which mingle with multiple cultures of other immigrants, and the outcome will not be a monoculture. Multicultural education is meant to highlight this phenomenon and become a source of transformation for the society, allowing for growth within each cultural reality.

The movement is therefore stuck in the past, static and homogeneous rather than dynamic. The amalgamation of different disciplines in the field leads to practitioners not having a common vision nor speaking with a united voice. The historic success of the movement was its root as a social movement mobilizing its constituent base to influence the general public. This paper proposes a change in strategy by learning from mistakes of the past. There is need for renewed and concerted effort to remobilize movement focusing on grassroots to create balance between soft approaches of advocacy and direct interventions. It is suggested multicultural education return to its roots as a social movement which can bridge gap between theory and rhetoric, as well as implement definitive actions based on best practices from around the world to help translate theory into action.

Time- 2:30-2:50 pm , Location- Field House Auditorium Room 2230

Poster Presentations

3:00 - 4:25 pm

Student Union Rooms 2582 & 2584

Abstracts are listed in alphabetical order using the first name of the presenter

1. Optimized Determination of L-Dopa at a Glassy Carbon Electrode Modified with Electrodeposited Films of Caffeic Acid

Ahmad Rohani far, Jon R. Kirchhoff
Chemistry and Biochemistry, The University of Toledo

In this work, determination of L-dopa at a glassy carbon electrode (GCE) modified with electrodeposited films of caffeic acid was optimized in the presence of common biological interferences. An electroactive thin layer of poly caffeic acid was deposited on the surface of a GCE under potentiostatic conditions in aqueous solution. Analysis of L-dopa was determined by square wave voltammetry after the experimental parameters of pH, step, amplitude, and frequency were studied by a full factorial design to identify the significant parameters and their interactions. The results showed that pH, step, and amplitude were significant whereas amplitude did not significantly impact response. Subsequently, a central composite design was performed for the three significant factors in order to further optimize the method. The optimal conditions were pH: 4; step potential: 6 mV; amplitude: 92 mV. The modified electrode demonstrated high selectivity for L-dopa in the presence of common biological interferences.

2. Synthesis of Valuable ω -Difunctional Compounds via Cross Metathesis of Methyl Oleate and Cis-2-Butene-1,4-Diol

Ajith Yapa Mudiyanse, Kana Yamamoto
Chemistry and Biochemistry, University of Toledo

Synthesis of commodity chemicals from readily available natural resources are gaining increased attention because of growing concerns over environmental sustainability. One such commodity chemicals with increasing demands are higher-order nylons (polyamides) that are employed in many industrial sectors. They are produced by polymerization of aliphatic amino acids. Among them, Nylon 11 monomers is currently produced from ricinoleic acid, a rare fatty acid available from castor beans, in five steps via an intermediate methyl undec-10-enoate

3. Development of Protocol to Detect and Quantify Thumb Carpometacarpal Joint Laxity and Force Application in Subjects with Osteoarthritis

Amber Cussen, Tamara Bush

Department of Mechanical Engineering, Michigan State University

Thumb carpometacarpal (CMC) osteoarthritis (OA) is widespread, and can cause tasks like turning doorknobs or opening medication to become time consuming and painful. Joint laxity and loss of muscle strength are known contributors to OA pathology, however few have sought to determine the degree of joint laxity or the changes in force application during active range of motion (AROM). We hypothesize that subjects with thumb CMC OA will have reduced force application, reduced AROM, and increased joint laxity compared to asymptomatic controls. In this pilot study, we use motion capture to identify and quantify thumb CMC AROM, joint laxity, and generation of force during flexion, extension, adduction and abduction motions. Our results suggest that motion capture is sufficient to detect 3D kinematics of thumb CMC joint OA. Future studies will test a large sample of OA and asymptomatic controls to further investigate the potential differences observed in this study.

4. Electropolymerization of Conductive Ionic liquids

Amila Devasurendra, Jon Kirchhoff

Chemistry and Biochemistry, The University of Toledo

Ionic liquids (ILs) are salts that exist as liquids under 100 °C. The nature of different chemical functionalities of ILs can be modulated to have unique interactions with analytes for selective detection in complex matrices.

In this project, different ILs will be covalently bonded to electropolymerizable organic heterocycle, thiophen, to create novel electrically conductive and polymerizable ILs. These newly synthesized monomers will be immobilized onto the surface of the electrode substrates by electrodeposition to develop conductive polymeric ionic liquid chemically modified electrodes (CPILCMEs). For the characterization, more specific electrochemical and other independent methodologies will be employed. The CPILCMEs will be then use as novel immobilization matrices for fabricating selective and sensitive sensors aimed for the detection and quantitation of important analytes.

5. A NoSQL Data Model for Running Big Data Workflows in the Cloud

Aravind Mohan, Shiyong Lu
Computer Science, Wayne State University

In this poster, we propose a new big data platform that: 1) supports high-performance MapReduce-style workflows that automate data partitioning and data-parallelism execution. In contrast to the traditional MapReduce framework, our MapReduce-style workflows are fully composable with other workflows enabling dataflow applications with a richer structure; 2) automates cloud virtual machine provisioning and deprovisioning on demand according to the sizes of input datasets; 3) enables a flexible framework for workflow executors that take advantage of the proposed NoSQL data model to improve the performance of workflow execution in the cloud.

6. Clinic-Based Motivational Interviewing Targeting Children's BMI: A Meta-Analysis of RCT

Areeg Zuair, Hossein Yarandi
Nursing, Wayne State University

Background: Motivational interviewing (MI), a client-centered approach to therapy focusing on building intrinsic motivation for change and resolving ambivalence.

Purpose: To conduct a meta-analysis and systematically review randomized control trials (RCTs) that investigated the effectiveness of MI for reducing body weight, as measured by changes in BMI in obese or overweight children in a health care setting.

Methods: Studies were retrieved from electronic reference databases (PubMed, CINAHL, and PsycINFO). Weighted mean effect sizes, using random-effects assumptions, was calculated.

Results: Children in the MI intervention conditions had lower BMIs at the final assessment. Using random model effect the Standardized mean difference = -0.236 [95% CI $-0.348, -0.125$], $P = 0.000$. Also, MI interventions were more successful at decreasing body weight when the study sampled more Caucasians. Interventions that involved parents had a greater effect than those that involved adolescents only. However, there is insufficient evidence about the optimal dose of MI for successful weight loss.

7. Largazole Analogues as Histone Deacetylase Inhibitors: Synthesis and Biological Evaluation

Ayad Al-Hamashi, L. M. Viranga Tillekeratne
Medicinal and Biological Chemistry, Toledo

Histone deacetylase (HDAC) enzymes, which are overexpressed in many cancer tissues, present a potential target for cancer chemotherapy. Four HDAC inhibitors (HDACis) are currently in clinical use as anticancer drugs. Many more are in different stages of clinical investigation. Selective inhibition of specific HDAC isoforms to preferentially suppress the proliferation of specific cancer cells to minimize undesirable side effects of nonspecific inhibitors is a goal yet to be achieved.

Largazole, a macrocyclic depsipeptide anticancer agent isolated from a marine cyanobacterium, is a class I selective HDAC inhibitor. The depsipeptide cap group of largazole can be targeted to develop isoform selective HDACis. We have used molecular modeling approaches to design several new largazole analogues with modified cap groups to modulate binding interaction with the enzyme surface. We used a novel protection/deprotection protocol to synthesize these analogues. The antiproliferative activity and HDAC isoform selectivity of the analogues synthesized were evaluated.

8. Metagenomic Analysis of Antibiotic Resistant Genes in a Conventional and Membrane Bioreactor Wastewater Treatment Plant

Camille McCall, Irene Xagorarakis
Civil and Environmental Engineering, Michigan State University

Wastewater treatment plants (WWTPs) are known environments for the presence and transfer of antibiotic resistant genes (ARGs), an evolving environmental pollutant. This study aimed to explore the prevalence of ARGs and resistant bacteria in a conventional, and a membrane bioreactor (MBR) WWTP in Michigan (USA). A bioinformatics approach was implemented to detect ARGs in activated sludge (AS), before disinfection (BD), and effluent, or after disinfection (AD) in each WWTP. Metagenomic alignment detected sulfonamide, tetracycline, macrolides, rifamycin, aminoglycoside, and β -lactamase to be prevalent ($\geq 80\%$ nucleotide homology) ARGs in both WWTPs. Effluent samples yielded the highest presence of ARGs in each plant compared to AS and BD samples. Quantitative analysis found that 57.89 and 41.67% of unique prevalent ARGs appeared after disinfection for the conventional and MBR WWTPs, respectively. The occurrence of ARGs increased in both WWTPs as treatment progressed further suggesting that increased wastewater treatment selects for antibiotic resistance.

9. Extracytoplasmic Stress Responses: σ E and the Phage Shock Protein Response

Cara DeAngelis, Jyl Matson

Medical Microbiology and Immunology, University of Toledo

The bacterium *Vibrio cholerae* naturally inhabits aquatic environments, but a few strains are pathogenic in humans causing the diarrheal disease cholera. While rare in the United States and other industrialized nations, cholera is endemic in more than 50 countries. Many bacteria have developed mechanisms to quickly regulate gene expression for survival in different environments. One way they modulate gene expression is through sigma factors. We performed RNA sequencing to determine what genes σ E regulates in *V. cholerae*. A set of genes encoding the phage shock proteins (Psp), were upregulated in the absence of σ E, suggesting a compensatory role. The Psp response is completely uncharacterized in *V. cholerae*. Therefore, we are using several methods, including transcriptional reporters, various growth conditions, and protonophores to determine what conditions induce the Psp system in *V. cholerae*. These studies may give us greater insight into the relationship between the Psp and σ E stress responses.

10. Preliminary Characterization of Pyrimidine Biosynthesis Protein Aspartate Transcarbamoylase (ATCase) in *Pseudomonas aeruginosa*

Chandni Patel, David Evans

Biochemistry and Molecular Biology, Wayne State University School of Medicine

Aspartate transcarbamoylase (ATCase) in *Pseudomonas aeruginosa* is a class A enzyme is a dodecamer consisting of six copies of a 36-kDa catalytic chain and six copies of 45-kDa polypeptide of unknown function. The 45-kDa polypeptide is homologous to dihydroorotase but lacks dihydroorotase activity. *Pseudomonas aeruginosa* aspartate transcarbamoylase catalytic and pseudo-dihydroorotase (pDHO) subunits were overexpressed separately in *Escherichia coli* and purified using affinity column chromatography. ATC catalytic subunit is inactive in the absence of pDHO suggesting that ATCase catalytic subunit and pDHO need to form a complex in order to form a functional and active ATCase.

11. The Relationship Between Lead, Race, Disability and the School To Prison Pipeline

Charles Bell, David Merolla
Sociology, Wayne State University

Several studies have documented the prevalence and harmful effects associated with lead toxicity in pediatric populations. For example, in 1997 the Center for Disease Control (CDC) reported approximately 17 percent of the children tested for lead toxicity in Michigan were found to have blood lead levels greater than 10 micrograms per deciliter ($\mu\text{g}/\text{dl}$). As lead toxicity in school-age children is increasingly associated with cognitive and emotional impairments, it is important to explore the relationship between lead exposure and the school to prison pipeline. For example, in the 2009–2010 school year, research shows nationally 25 percent of African American, 12 percent of Latino, 11 percent of American Indian, and 9 percent of white students with disabilities were suspended from school. This presentation will explore the relationship between lead toxicity and the school to prison pipeline to highlight how students with cognitive and emotional impairments are placed on a path to prison.

12. Role of dextran in silica nanoparticle-mediated silencing

Daniel Vocelle, S. Patrick Walton
Chemical Engineering, Michigan State University

New approaches are needed to combat the limitation of modern therapeutics. One potential approach, short interfering RNA (siRNA) therapeutics, is capable of highly specific targeting for a wide range of proteins through the use of RNA interference (RNAi) but limited by inefficient delivery vehicles.

Our goal is to define nanoparticle characteristics that are essential for siRNA delivery. Using silica nanoparticles (SNPs), we are investigating how the chemical and physical properties of the delivery vehicles influence functional properties such as siRNA function, siRNA binding affinity, membrane translocation, and intracellular trafficking. For our SNPs, vehicle size, structure, charge, and surface functionalization can be varied to determine optimal vehicle design criteria.

Here we will present our results to date demonstrating that multiple vehicle characteristics influence the siRNA silencing that can be achieved, including amine content, SNPs stability at low pH, quantity of siRNA bound per SNP, and the presence of carbohydrates (i.e., dextran).

13. Sex-Dependent Effects of Isolation-Rearing in Tests of Anxiety

Dawn Muskiewicz, Frank S. Hall, Ph.D.

Pharmacology, The University of Toledo

Post-weaning isolation of mice produces pathological behavioral phenotypes indicative of a hyperdopaminergic and hyposerotonergic function. In humans, there are sex-dependent differences in the incidence and developmental time-course of psychiatric conditions. Male and female C57BL/6J mice (N=10/group), housed singly or socially at 21 days postnatal for 8 weeks, were subjected to anxiety tests (elevated plus maze, open field, and light-dark test). Some sex-dependent effects on measures of anxiety were observed. Isolated females spent less time in the center of an open field, indicative of increased anxiety, and more time in the closed arms of the elevated plus maze than social female mice. In the light dark test isolation-reared female mice had fewer transitions between the light and dark zones. These data suggest that early social isolation has distinct sex-dependent effects in mice, and may indicate that similar mechanisms may influence the development of psychiatric disorders in humans in a sex-dependent manner.

14. Trapping Mutants Identify LSD1 and Eg5 as Novel Substrates of Histone Deacetylase 1

Dhanusha Nalawansha, Mary Kay

Chemistry, Wayne state university

Aberrant expression of histone deacetylase 1 (HDAC1) is implicated in multiple diseases, including cancer. As a consequence, HDAC1 has emerged as an important therapeutic target for drug development. HDAC1 regulates key cellular processes, such as cell proliferation, apoptosis, and cell survival, by deacetylating both histone and non-histone substrates. Due to the lack of simple tools to identify physiological substrates of HDAC1, the full spectrum of HDAC1 activities in the cell remains unclear. We identified mitosis-related protein Eg5 as a substrate of HDAC1 using a trapping mutant strategy. HDAC1 colocalizes with Eg5 during mitosis, suggesting a role for HDAC1 in the mitotic defects observed with HDAC inhibitor drugs. By extending trapping strategy to HEK293 cells, we identified Lysine Specific Histone Demethylase (LSD1) as a substrate of HDAC1. Further studies are ongoing to understand how HDAC1-mediated deacetylation affects LSD1 activity or protein-protein interactions. Discovery of novel substrates using trapping mutants will reveal the full activities of HDAC1 in both physiological and pathological conditions, which will lead to a better understanding of HDAC inhibitor mechanism of action.

15. Synthesis and Characterization of Marcasite Iron Dichalcogenides FeSe₂ and FeTe₂ Nanocrystals

Ebin Bastola, Randy Ellingson
Physics, University of Toledo

We report the wet-chemical method for the synthesis of FeSe₂ and FeTe₂ nanocrystals (NCs) using iron(II) bromide, elemental Se, and Te precursors. These NCs have been characterized by using X-ray diffraction (XRD), scanning electron microscopy (SEM), energy dispersive spectroscopy(EDS), Raman, and UV-Vis-NIR spectroscopy. Both FeSe₂ and FeTe₂ possess orthorhombic crystal structure in marcasite phase with irregular surface morphology of the NCs.

16. Texting white lies

Elizabeth Tobin, Thomas Holtgraves
Psychological Sciences, Ball State University

Computer-mediated communication (CMC) has become a popular way for people to communicate, specifically young adults quite often use communication through cell phones via text messaging (Lenhart, 2012). One line of research that has begun incorporating text messaging modalities is deception research due to the sheer volume of text messages that are deceptive in nature (George & Robb, 2008). Deception research which focuses on text messaging has examined both linguistic qualities of deceptive text messaging (Hancock et al., 2004; Newman et al., 2003), as well as the ability of people to detect deceptive text messages (Boyle et al., 2008). One area of deception research that has not been thoroughly studied within CMC is white lie deception, or small lies that are not intended to harm the receiver, rather to oftentimes help the receiver (DePaulo & Kashy, 1998). Therefore, the current research focused on examining deceptive text messaging in new ways.

17. PACAP Induces Persistent Transcription-Dependent, Activity-Independent Synaptic Plasticity.

Eric Starr, Joseph Margiotta
Neurosciences, University of Toledo

Pituitary adenylate cyclase activating-polypeptide (PACAP) is a potent neuromodulator localized to presynaptic terminals throughout the nervous system. In autonomic ciliary ganglion (CG) neurons, PACAP induces a PAC1R mediated signaling cascade that persistently enhances cholinergic synaptic output for 48 hours via a transcription dependent mechanism. We report here that the physiological correlates underlying this persistent PACAP-induced plasticity reflect an activity-independent increase in both post- and presynaptic strength. First, reversible inhibition of synaptic activity failed to block the persistent PACAP-induced plasticity. Second, the sustained PACAP-induced plasticity was accompanied by significant increases in both spontaneous miniature EPSC amplitude and ACh release. No detectable differences in excitability were observed. Third, analysis of confocal images revealed that PACAP enhanced the size and number of colocalized puncta. These results indicate that PACAP induces a persistent synaptic plasticity through transcription-dependent, activity-independent alterations in synaptic function and in the structural arrangement of pre- and postsynaptic components.

18. FAM129B, a Novel Adherent Junction Protein, Plays a Role in Cancer Cell Invasion

Fatme Hachem, David Evans
Biochemistry and Molecular Biology, Wayne State University

FAM129B, is a member of a family of novel proteins that include FAM129A and FAM129C. Little is known about the structure and functions of these proteins. Previously; we have shown that FAM129B suppresses the TNF α induced apoptotic pathway in HeLa cells by promoting the NF-KB pathway. Preliminary data in our lab suggests that FAM129B plays a role in cancer cell invasion. FAM129B expression is highly elevated in breast cancer cell lines compared to non-cancer breast cell lines. The expression of FAM129B also goes higher in the metastatic breast cancer cell line, MDA-MB-231 suggested by western blot analysis of FAM129B expression in those cell lines. Also silencing of FAM129B expression in MDA-MB-231 cells decreased cell motility in vitro. We also show that FAM129B expression increased when epithelial to mesenchymal transition (EMT) is induced. Alternatively, silencing of FAM129B expression in A549 cells has no effect on induction of EMT but increased initial E-cadherin expression.

19. Development of the 5-Choice Serial Reaction Time Test for Studies of Attention Deficit Hyperactivity Disorder

Federico Resendiz Gutierrez, F. Scott Hall Ph.D
Experimental Therapeutics, University of Toledo

The 5-choice serial reaction time task is used to study attention and impulsivity in mice. The test involves a specialized operant chamber in which 5 visual stimuli can be presented, which indicate which of 5 response (nose-pokes) will result in the presentation of a reinforcer. The mouse must attend to the appropriate stimulus in order to make a correct response (a measure of attention), avoid premature responses (a measure of impulsivity), or omissions (also a measure of attention). Previous studies have failed to establish conditions of suboptimal performance for pharmacological testing of attention deficit and hyperactivity disorder (ADHD) medications. This study aims to establish these conditions using C57BL/6J mice. Data shows suboptimal performance at low durations of visual stimuli. It will now be used to examine attentional deficits in 2 animal models of ADHD: isolation-rearing and dopamine transporter knockout mice. The effects of established ADHD medications will also be examined.

20. Frog Call Survey Results at Irwin Prairie State Nature Preserve 2013-2015

Jeanna Meisner, Jonathan Bossenbroek
Department of Environmental Sciences, University of Toledo

Restoration efforts at Irwin Prairie State Nature Preserve have been occurring since 2003 with a focus on removal of glossy buckthorn, an invasive shrub.. The removal of the thickets alter the habitat, including the vegetation and hydrology. We expected these changes to influence anuran presence and abundance in the preserve. Over the past 3 years, volunteers have quantified the abundance of Western Chorus Frogs, Gray Tree Frogs, and Spring Peepers by counting their calls. We hypothesized that the abundance at managed sites would increase over time, while the abundance at unmanaged sites would remain stable over time. We performed an analysis of covariance of Audio Point Count Surveys to examine the relationship of unmanaged and managed sites through time. The results indicate no significant relationships with management and time. Overall there was an increase in call index each year and unmanaged sites had a higher call index than managed sites.

21. The Effect of Friendship on Malignant Social Psychology in Persons with Dementia

Jennifer Perion, Jerry Van Hoy
Master of Liberal Studies, University of Toledo

Social scientists have identified negative exchanges, known as Malignant Social Psychology, that can threaten one's social identity. Friendship, a voluntary relationship often outside of the caregiver/care recipient dynamic, may offer benefits for persons with dementia if it offers a balanced reciprocal exchange. This study examines friendship for persons with dementia, and whether opportunities exist for reciprocal behavior that influences the experience of Malignant Social Psychology.

Six men and four women experiencing memory problems were recruited from programs sponsored by a chapter of The Alzheimer's Association. During a one-time interview, participants were asked questions about existing friendships including opportunities for mutual support. The data were analyzed using a qualitative phenomenological method that revealed five themes: recognizing the importance of longevity in friendship; helping one another is a normal part of friendship; feeling "alive" through the give and take in friendship; knowing somebody is there for them; and seeking security through friendship.

22. Potential to decrease phosphorus runoff by stimulation of decomposers with sodium and carbon

Jessica Susser, Michael Weintraub
Environmental Sciences, University of Toledo

Phosphorus runoff from rural landscapes in Northwestern Ohio is one of the principal causes of harmful algal blooms in the Lake Erie Basin. Decreasing the amount of phosphorus added to farm soils can decrease the amount of phosphorus entering Lake Erie. Much of the phosphorus added to farm soil binds to soil particles and is relatively inaccessible to plants, thus increasing the amount of phosphorus fertilizer required. We are working to find ways to increase the efficiency of phosphorus fertilizer application, thereby decreasing the amount of phosphorus fertilizer required. Specifically, we are testing the hypotheses that stimulating decomposer organisms that can release soil-bound phosphorus (such as bacteria and invertebrates) with carbon and sodium may increase the proportion of soil phosphorus available to plants.

23. Deorphanization of G-Protein Coupled Receptors Using Sensitive GPCR Assays: A Study on N-Octanol

Kasun Ratnayake, Ajith Karunaratne
Chemistry and Biochemistry, University of Toledo

Identifying ligands for GPCRs is pivotal in drug development and in medicinal chemistry. Structural diversity in GPCRs allows them to interact with ligands with specific characteristics. These ligands can induce conformational changes in GPCR structure resulting in a diverse set of functional states. These states are important in pathophysiology. 1-Octanol is known to stimulate olfactory receptors. Octanol has induced behavioral characteristics in *c. elegans*. No human receptor(s) have been identified for octanol. However, it interacts with ion channels; TRPA1 and GABA-A. We examined whether octanol activates G-protein signaling pathways in living cells. We observed a substantial Ca²⁺ release in HeLa cells upon adding octanol. To test if this is due to Gq coupled GPCR activation, we used a Gβγ translocation and PIP₂ hydrolysis using confocal microscopy. Our results suggests that octanol may act as a partial agonist for gastrin releasing peptide receptor which is primarily responsible for itch sensation.

24. Investigating High Density Polyethylene – Graphene Nanoplatelet Composites for the Production of Fuel Lines and Fuel Tanks

Keith Honaker, Lawrence Drzal
Chemical Engineering and Materials Science, Michigan State University

Graphene nanoplatelets (GnP) of different sizes were investigated for their ability to modify HDPE for potential fuel system applications, focusing on compounding via melt mixing in a twin-screw extruder. Mechanical properties, crystallinity of the polymer matrix, and permeation to oxygen and fuel were assessed as a function of the GnP concentration. The surface of GnP acted as a nucleation site for the generation of HDPE crystallites, increasing the crystallinity. The flexural properties were improved, clearly influenced by the platelet size and quality of dispersion. A sharp, 46% decrease of the impact resistance was observed, even at low GnP concentration (0.2 wt. %). With a 15 wt. % GnP-M-15 (platelets with a 15 micron diameter), a 73% reduction in oxygen permeation was observed and a 74% reduction in fuel vapor transmission. This correlation was similar throughout the GnP concentration range. The smaller diameter platelets had a lesser effect on the properties.

25. Influence of Chronic Restraint (Psychosocial Stress) on Young and Aged Rats

Kendra Staggs, Eric Blalock

Pharmacology and Nutritional Sciences, University of Kentucky

Psychosocial stress (PS) is a non-painful stimulus associated in humans with major life changes (i.e. social isolation) and strongly influences multiple systems (e.g., corticosterone level, body temperature regulation, sleep and cognition). There is an increased likelihood of experiencing chronic PS with age, and the negative consequences to that exposure are more severe. Despite this, little work has investigated mechanistic changes with age in the chronic PS response. We hypothesize that aged subjects' initially blunted PS response will be followed by chronically worsened outcomes. To test this, young (3mos) and aged (19mos) male Fischer344 rats were assigned to control or PS groups and implanted with wireless telemetry from Data Sciences International to monitor sleep and temperature. Chronic PS (restraint, 3 h/day, 4 days/week, 4 weeks) effects on Morris water maze and body temperature were collected. Aged animals showed significant deficits in water maze while hyperthermic responses were conditional on stress exposure.

26. Identification of Protein Glutathionylation in Response to Mitochondrial ROS

Kusal Samarasinghe, Young-Hoon

Chemistry, Wayne State University

Glucose metabolism and mitochondrial function are closely interconnected with cellular redox-homeostasis. Although glucose starvation, which mimics ischemic condition or insufficient vascularization of cells, is known to perturb redox-homeostasis, global and individual protein glutathionylation in response to glucose metabolism or mitochondrial activity remains largely unknown. We employed our clickable glutathione approach, which form clickable glutathione (azido-glutathione) by using a mutant of glutathione synthetase (GS M4), for detection and identification of protein glutathionylation in response to glucose starvation. We found that protein glutathionylation is readily induced in HEK293 cells in response to low glucose concentrations when mitochondrial reactive oxygen species (ROS) are elevated in cells, and glucose is the major determinant for inducing reversible glutathionylation. Proteomic and biochemical analysis identified over 1,300 proteins, including SMYD2, PP2C α , and catalase. We further showed that PP2C α is glutathionylated at C314 in a C-terminal domain, and PP2C α C314 glutathionylation disrupts the interaction with mGluR3, an important glutamate receptor associated with synaptic plasticity.

27. Enzymatic Synthesis of Polycardanol and Its Antifouling Characteristics

lohit sharma, Dong Shik Kim

Chemical and Environmental Engineering, University of toledo

Polymers synthesized from renewable plant based monomers are gaining importance since they reduce reliance on petroleum based feedstock. Phenol–formaldehyde resins are widely used as surface coatings, adhesives and friction materials. Enzymatic polymerization is used to polymerize polyphenols with a good chemo selective conversion. Cardanol is catalyzed by soybean peroxidase (SBP) has been carried in 2-propanol/phosphate buffer using Tween-20 as a surfactant. The reaction scheme reduces dependence on formaldehyde for industrial production of resins and provides a renewable and bio-based starting material. In this study, polycardanol is used as a base material for anti-fouling coating. Biofouling is a main source of bacterial infection and poses potentially harmful impacts on human health. This study discusses effects of different additives to enhance anti-fouling activities of cardanol-based polymeric coatings to inhibit attachment of bacteria, cells and algae.

28. An Efficient Big Data Placement Strategy in Cloud-based Big Data Workflows

Mahdi Ebrahimi, Shiyong Lu

Computer Science, Wayne State University

In this poster, we propose a new big data placement strategy that improves workflow performance by minimizing data movement across multiple virtual machines. We applied a generic population-based metaheuristic optimization algorithm to minimize the workflow makespans by clustering the most dependent workflow datasets together.

29. Glycogen Synthase Kinase 3 Maintains Mitotic Arrest by Regulating Mitotic Checkpoint Complex Levels

Maisha Rashid, Dr. William R. Taylor

Biological Sciences, University of Toledo

Multiple cell cycle checkpoints ensure genomic integrity during cell division. We discovered a novel role of glycogen synthase kinase 3 (GSK3) in the mitotic checkpoint. We observed that GSK3 inhibitors, SB 415286 (SB), RO-81220 (RO) and LiCl, inactivate the mitotic checkpoint induced by spindle toxins nocodazole or taxol, causing cells to prematurely exit mitosis. As well, a GSK3 truncation mutant, obtained via crispr/cas9 system and with a deleted GSK3 inhibitory region, shows an increased mitotic index in taxol. Spindle toxins cause mitotic arrest by inducing the assembly of the mitotic checkpoint complex (MCC), composed of BubR1, Bub3, Cdc20 and Mad2. GSK3 inhibitors decreased MCC formation induced by spindle toxins, indicating a potential regulatory mechanism of checkpoint override. Additional genetic experiments implicated the de-acetylase sirtuin2 downstream of GSK3 in its mitotic regulation.

Time- 11:25-11:45 am , Location- Field House Auditorium Room 2270

30. Characterization of Human Anti-Rhamnose Antibodies and Their Use to Enhance Antigen Presentation of Vaccines

Md Kamal Hossain, Katherine Wall
Medicinal & Biological Chemistry, University of Toledo

Anti-rhamnose antibodies are among the most abundant natural anti-carbohydrate antibodies in human serum. We use these natural antibodies to target rhamnose-bearing anti-cancer vaccines to antigen presenting cells via stimulatory Fc receptors. To isolate anti-rhamnose antibodies from human serum, we have prepared a rhamnose affinity column with a rhamnose-2 amino ethyl linker conjugate coupled to CNBr-activated Sepharose. We have characterized the antibody isotypes and tested the enhancement of antigen presentation in vitro by incubating the purified antibodies with Rha-vaccine, dendritic cells, and primed CD4+ T cells. Use of rhamnose as a targeting moiety should be applicable to a variety of vaccine formulations and antigens. Supported by NIH 2R15-GM094734.

31. Characterization and Quantitation of Collagen Oxidation in TGF β -Stimulated Fibroblast Cultures

Muhammad Erfan Uddin, Dr. Johanna Krontiris-Litowitz
Biological Sciences, Youngstown State University

Hernia repair is one of the major problems faced by surgeons. Approximately 10% of abdominal surgical incisions result in incisional hernias and approximately 40% of these require additional corrective surgery. Although surgical techniques are constantly improving, cell-based therapies that augment surgical scar formation have been utilized more and more frequently as an alternative. Studies have identified a variety endogenous signaling molecules that direct the events of wound healing, however, little is known about how these signal molecules modulate cell based therapy and scar repair.

The objective of this study was to investigate changes in collagen structure and oxidation in a fibroblast culture that simulates the events and conditions found during wound healing. We report changes in the 2D gel profile of fibroblast collagen following peroxidase oxidation. We also examine changes in collagen oxidation and cultures treated with TGF- β to see if this peptide protects collagen from oxidation.

32. Revealing the Structural Basis for RIFL's Effects on Angptl Proteins in Lipid Metabolism

Nicholas Cairl, Cynthia Smas

Biochemistry and Cancer Biology, University of Toledo

RIFL is a novel secreted factor first identified by this laboratory that regulates serum triglyceride at the level of LPL activity. Angptl3 and Angptl4 are soluble inhibitors of LPL action. Using in vitro studies, we have observed that RIFL impacts levels of soluble Angptl3/Angptl4 secreted in cell culture media. We hypothesized that if RIFL's impact on levels of soluble Angptl3/Angptl4 are a critical aspect of its mechanism of action, then these effects would occur across species. We compared RIFL protein sequences of ~20 species and determined that opossum RIFL is least related to human/murine RIFL. By western blot analysis, we show that opossum RIFL is similar to murine RIFL in its ability to reduce levels of soluble Angptl3/Angptl4 in cell culture media. This suggests that the impact of RIFL on soluble levels of Angptl3/Angptl4 is conserved across species and therefore may be important to the mode of RIFL action.

33. A Reappraisal of the Sulfation of 6-O-Desmethylnaproxen (O-DMN) by the Human Cytosolic Sulfotransferases (SULTs)

Noor Hussein, Ming-Cheh Liu, Ph.D.

Pharmacology and Experimental Therapeutics, University of Toledo

Abstract: Sulfate conjugation as mediated by the cytosolic sulfotransferases (SULTs) has been shown to be involved in the metabolism of naproxen, specifically its metabolite 6-O-desmethyl naproxen (O-DMN). The present study aimed to obtain a comprehensive account of the human SULTs that are capable of sulfating O-DMN. Of all 13 known human SULTs tested, seven, SULT1A1, SULT1A2, SULT1A3, SULT1B1, SULT1C2, SULT1C4, and SULT1E1, displayed O-DMN-sulfating activity, when tested at elevated substrate concentration (500 μ M). At low substrate concentration (10 μ M), however, only SULT1A1 and SULT1A3 showed detectable activity, with the former being nearly two order of magnitude more active than the latter. A pH-dependence study indicated that SULT1A1 displayed a broad pH optimum spanning pH 5.5 - 7. Kinetic parameters of the sulfation of O-DMN by SULT1A1 were determined. Cultured HepG2 human hepatoma cells and Caco-2 human colon carcinoma cells were shown to be capable of sulfating O-DMN under metabolic conditions. Moreover, experiments using human organ specimens showed that the O-DMN-sulfating activity detected in the liver and small intestine (0.502 and 0.497 nmol/min/mg, respectively) were comparable and were much higher than those detected for the samples prepared from lung and kidney. These results derived from the current study provided relevant information concerning the sulfation of O-DMN both in vitro and in vivo.

34. The Effect of Oil Palm Phenolics (OPP) on Pancreatic Ductal Adenocarcinoma (PDAC) in Transgenic Mouse Model

Nurul Razalli, Smiti Gupta

Nutrition and Food Science, Wayne State University

This study aimed to explore the in vivo effects of oil palm phenolics (OPP), a water-soluble extract from African oil palm, *Elaeis guineensis*, in transgenic mouse model of Pancreatic Ductal Adenocarcinoma (PDAC). Fore stomach histological analyses showed that dietary OPP did not exhibit sign of toxicity in non-cancer control group. OPP treated groups (OPP alone and OPP with gemcitabine) had a slower progression of tumor. All treatment groups had a significant decrease in total number of Pancreatic Intraepithelial Neoplasia (PanIN) where the combination of OPP and gemcitabine (KPG) displayed the lowest count. Immunohistochemistry with S100P and SMAD4/DPC4 proteins validated the histological changes. Compared to the untreated group, expression of MMP9, CCND1, and Notch1 genes was down regulated most significantly in KPG group. Collectively, the results demonstrate potential benefit of dietary OPP as part of combinatorial therapy against progression of PDAC.

35. Arteriolar Sclerosis and Cognitive Decline in the Kentucky Appalachian “Stroke-Belt.”

Omar Al-Janabi, Gregory Jicha

Medical Sciences, University of Kentucky

The relationship between Arteriolar Sclerosis (AS) and cognitive impairment or dementia has been studied with significant variability in findings among groups. We hypothesized that AS, measured quantitatively using MRI T2 volumetric to measure total white matter hyperintensity (T-WMH) volumes, will identify specific patterns of cognitive decline in our cohort. A Cross-sectional analysis of clinical and quantitative MRI data on 114 subjects with normal cognitive function (n=52) and mild cognitive impairment (n=62) was performed. Quantitative T-WMH volumes were examined in relation to cognitive domains test scores using linear regression models adjusted for age, gender, and education. T-WMH volumes were associated with decreased performance on the Trail Making Test A & B (p= 0.001 and p= 0.008) and long-delayed free recall on the California Verbal Learning Test (p= 0.009). Our findings, like others, suggest that AS impact processing speed, executive function, and provide evidence for effects on short-term memory in our cohort.

36. Mechanisms Underlying the Effects of Synthetic Psychoactive Cathinones

Omar Issa, Dr. Frank Scott Hall
Pharmacology, University of Toledo

Background. Methylone (3,4-methylenedioxymethcathinone) is a synthetic psychoactive cathinone (SPC) with psychostimulant and hallucinogenic properties. SPCs are monoamine transporter (DAT, NET and SERT) releasers or blockers. SPC abuse is a public health problem, although it is unknown whether SPCs are more dangerous than methamphetamine (METH) or 3,4-methylenedioxymethamphetamine (MDMA), which have similar subjective effects. Hyperthermia is an important mediator of the adverse effects of MDMA, but its importance is unknown for SPCs. Methods. The lethal and hyperthermic effects of methylone were examined in DAT and SERT knockout mice. Results. The LD50 for methylone was lower than METH or MDMA, and it produced hyperthermia similar to METH. Lethality was reduced in DAT KO, but not SERT KO, mice, while hyperthermia was largely unaffected. Selective dopamine receptor antagonists reduced methylone-induced hyperthermia. Conclusions. These data clearly dissociate the lethal and hyperthermic effects of methylone, suggesting that factors other than hyperthermia are critical in methylone lethality.

37. Progress Towards the Synthesis of Derhodinosylurdamycin A Analogues Bearing Diverse 2-Deoxy Sugar Subunits

Padam Acharya, Jianglong Zhu
Department of Chemistry and Biochemistry, The University of Toledo

Angucycline antibiotics are one class of bioactive natural products containing angularly assembled tetracyclic ring frame and exhibit diverse biological activities such as antitumor, enzyme inhibiting, and platelet aggregation inhibiting activities. The urdamycins are a class of angucyclines produced by *Streptomyces fradiae* first isolated by Drautz and co-workers in 1986. Among urdamycins, derhodinosylurdamycin A was first reported as a bioactive natural product derivative which showed significant anticancer activity against L1210 Leukemia cells with IC50 value of 0.75 µg/ml. We have recently completed the first total synthesis of derhodinosylurdamycin A. In this presentation, we will describe our efforts in the synthesis of analogues of derhodinosylurdamycin A bearing diverse 2-deoxy sugar subunits for extensive SAR studies.

38. Exploiting Kinase-Catalyzed Labeling to Unravel the Cellular Phosphorylation Network

Pavithra Dedigama-Arachchige, Mary Kay Pflum
Chemistry, Wayne State University

Phosphorylation is a ubiquitous post translational modification implicated in many diseases, such as cancer. The phosphorylation status of cellular proteins is regulated by the activity of kinases and phosphatases. The biological significance of many phosphorylation events remain unknown because the methods to determine which kinase or phosphatase is responsible for phosphorylation are limited. Previously, we developed kinase-catalyzed labeling where kinases accept γ -modified ATP analogs, such as ATP-arylazide and ATP-biotin, to label phosphoproteins. To study substrates of kinases and phosphatases, we developed two new methods using kinase-catalyzed labeling. As one application, we developed K-CLASP (Kinase-catalyzed CrossLinking And Streptavidin Purification) to identify the in-cellulo kinase of a phosphorylated site on a protein. In this case, we used ATP-arylazide to mediate crosslinking between a biotin tagged peptide carrying a phosphosite of interest and the respective kinase. Using Protein kinase A (PKA) and its known peptide substrate kemptide, we demonstrated that K-CLASP is capable of identifying PKA as the kinase responsible for kemptide phosphorylation in cell lysates. For phosphatase substrate identification, we developed K-BIS-Phos (Kinase-catalyzed Biotinylation to Identify Substrates of Phosphatases). In prior work, we observed that labeling of phosphoproteins by ATP-biotin is reduced when phosphatases are inactive. The phosphatase dependency of biotinylation is due to the presence of already existing phosphorylation, which prevents ATP-biotin labeling. Therefore, in K-BIS-Phos, ATP-biotin labeling is carried out after the inactivation of a particular phosphatase. The loss in biotinylation can then be analyzed to reveal substrates. To establish K-BIS-Phos as a viable method, we carried out ATP-biotin labeling in lysates treated with the PP1/PP2A phosphatase inhibitor okadaic acid. Many known PP1 and PP2A substrates were observed validating our method.

39. Role of Stress Granules in RNase L Mediated Antiviral Pathway

Praveen Manivannan, Malathi Krishnamurthy
biological science, University Of toledo

An important feature of mammalian stress response is inhibition of translation initiation. These stalled initiation complex form cytoplasmic RNA granules called stress granules. Recently studies have shown that anti-viral proteins localize in stress granules. Viral dsRNA activates 2-5A oligoadenylate synthase (OAS) which in turn converts ATP to 2'-5' oligoadenylates (2-5A). These 2-5A bind with antiviral endoribonuclease RNase L and converts it to active form. Active RNase L cleaves viral and cellular ssRNA. Here we are trying to figure how these stress granules could play a role in RNase L induced antiviral pathway. Our studies have shown that activation

of RNase L induces stress granule formation and also increase induction of proinflammatory cytokines.

40. Wetland Change Assessment: In Selected Michigan Counties.

Queen Umeana, Dr. Yichun Xie

IGRE / Department of Technology, Eastern Michigan University

Since the early 1990's, the U.S. Environmental Protection Agency (USEPA) has been forecasting the loss of roughly 100,000 acres of wetlands annually in the United States. However, the quantities of wetland lost in the state of Michigan by year is yet unknown. As the awareness of wetland activities becomes more regulated, the compensation for lost wetland and the protection of existing wetlands increasingly becomes essential, (USEPA, 2004). In order to sustainably manage this ecosystem, the distinguishing qualities of wetlands remain to be analyzed. The Geographic Information System (GIS) within wetlands can be extraordinarily complex in determining a specific model. However, classifying a generalized model using raster grid analysis and spatially representing the area will introduce significant information on the restoration (gained wetlands) of wetlands.

This project is a continuation of a former project while introducing a raster model analysis that will be used to develop and identify wetland restoration (gained wetlands) in selected counties in the state of Michigan. The decision approach will incorporate a raster grid based land use land cover principle with GIS.

41. The Anecdotal Journey

Rachel Bennett, Amy Gregg

Natural Resources Environmental Management, Ball State University

Today, many youth have an obsession with being "plugged in" to electronic gadgets instead of investigating the natural world. Richard Louv coined the term "nature-deficit disorder" to explain the strong disconnect between children and nature; Louv also extends this disconnect to adults.

I am going to take you on a journey through various experiences I have had with children and their interaction(s) to the natural environment. At the end of the journey, I ask you this, "Will those precious moments in a natural environment be enough to create lasting engagements with nature, or will electronic gadgets win?"

42. Depression and Anxiety in First Semester Freshmen

Richard Ward, Anjolie Diaz

Psychological Sciences, Ball State University

The transition into college is associated with multiple changes and potential challenges (Doane et al., 2014) as well as a high prevalence of depression and anxiety (Eagan et al., 2014; Lu et al., 2015). This study aims to identify potential factors that may contribute to first semester students' negative mental health. Sixty-one freshmen reported their negative constitutional predispositions (negative affect), social support, and sleep patterns (sleep disturbances and daytime dysfunction). Results of regression analyses indicated that social support ($\beta=-.23, p<.05$), sleep disturbances ($\beta=.34, p<.05$), and negative affect ($\beta=.25, p=.058$) predicted anxiety in first semester freshmen ($R^2=.34, F(4, 56)=7.31, p<.001$). Negative affect ($\beta=.33, p<.05$), social support ($\beta=-.39, p<.05$), and daytime dysfunction ($\beta=.23, p<.05$) significantly predicted depression ($R^2=.37, F(4, 56)=8.30, p<.001$). Results suggest emotional predispositions, level of support, and sleep habits may contribute to anxiety and depression. Reports suggest as much as 33% of freshmen dropout (NCES, 2010). These findings may help inform college counseling centers and develop focused interventions for students.

43. Temperature Dependence of Ferromagnetic Resonance and Crystallization of CoFeB Thin Films

Ryan O'Dell, Michael Heben

Electrical Engineering and Computer Science, Toledo

The use of ferromagnetic alloy Co₄₀Fe₄₀B₂₀ was used to study the effects that temperature has on the crystallization and ferromagnetic resonance (FMR) of the material. The alloy is being used to fabricate microwave and magnetic memory devices which respond to the spin torque transfer (STT) effect. The alloy is used as the free layer in Spin Transfer Nano Oscillators (STNO), Spin Hall Oscillators and Spin Torque Transfer magnetic random access memory. At room temperature up to 500C as deposited the material is amorphous and produces FMR linewidths from (100-8 Oe) in a range from 15-2 GHz. The FMR linewidth indicates the magnetic loss of the material. Depositing the material above 500C leads to the alloy crystallizing and increases the grain size. The material will crystallize at 400C with post deposition annealing. The crystallization of the material changes the easy access of the magnetic moment and loses parallel FMR capabilities.

44. Phase Engineered High K Dielectric for Two Dimensional Electronics

Sagar Paudel, Zhixian Zhou

Physics, Wayne State University

The continuous miniaturization of electronic devices has sparked a lot of interest in the field of high K dielectrics. A lot of study has focused on different high K dielectrics, using different processes of growth. Due to the absence of dangling bond on the surface of 2D layered materials, there are several limitations of atomic layer deposition (ALD) high K dielectric, which keeps the high k dielectric integration of Transitional Metal Dichalcogenides (TMD) still challenging. In this study we are focusing on high K dielectric integration of Transitional Metal Dichalcogenides (TMD) based FETs by phase engineering. Instead of deposition of high K dielectric by complex growth method, we prepared atomically flat high K dielectric using mechanical exfoliation followed by thermal oxidation.

In this work we proposed atomically thin Ta₂O₅ high k dielectric by phase engineering. The oxidation of the sample is confirmed by XPS and TEM study. From Capacitance Voltage measurement we found the dielectric constant of thermally oxidized Ta₂O₅ is 12.6. The oxidized ultra smooth Ta₂O₅ is used as back gate dielectric in MoS₂ FETs. We found the mobility of MoS₂ FETs up to 56 cm²V⁻¹s⁻¹ with sub-threshold swing ranging up to 70mV/decade.

45. SGEF, A Missing Link in SCRIBBLE Polarity Complex Formation and Adherence Junction Establishment

Sahezeel Awadia, Rafael Garcia-Mata

Department of Biological sciences, The University of Toledo

Several studies have provided evidence that small GTPases of the Rho subfamily seems to have a crucial role in cell polarization process. Rho GTPases whose main function is cytoskeleton remodeling has been shown to aid in cell polarization processes during early embryonic development. Rho GTPases exist in an active GTP bound and an inactive GDP bound conformations. Activation of RhoGTPases is mediated by a family of proteins called GEFs. We have previously shown that almost 40% of Rho-GEFs (including SGEF) contain a putative PDZ-binding motif at the C-terminus. PDZ domains are modular protein interaction domains that bind the C termini of target proteins and play a role in protein targeting and protein complex

assembly. The reiterated use of PDZ-binding motifs by Rho-GEFs might have originated as a way to facilitate the evolution of new cellular functions within cells, by creating novel connections between existing proteins and pathways. Our results and those of others suggest that these interactions not only play a role in targeting Rho-GEFs to their appropriate location in the cell but also function in modulating their activity.

46. Does Music Improve Rehabilitation of Left Spatial Neglect?

Sara Krebs, Alexia Metz

Rehabilitation Sciences, University of Toledo

Spatial neglect is a common consequence of stroke, about half of individuals who experience stroke manifest some degree of neglect (Bowen et al., 1999; Buxbaum et al., 2004). Those affected by spatial neglect fail to respond to stimuli present in space contralateral to their lesion (Bernardi et al., 2015). The mental representation of space is thought to share a common coding mechanism with auditory pitch (Lidji, Kolinsky, Lochy & Morais, 2007). Similarly, areas of the brain stimulated by music are also closely related to vision (Tsai, Chen, Huang & Lin, 2013). Therefore, it has been hypothesized that auditory feedback and the sequential nature of horizontally aligned instruments could be beneficial in rehabilitation of spatial neglect. The study of music's effect on spatial neglect is a new area, but very important for the future of rehabilitation. New findings regarding these potential treatment methods as well as future implications will be presented.

47. Hiring for Adaptability: It Depends on the Situation

Sarena Bhatia, Ann Marie Ryan

Psychology, Michigan State University

This laboratory study tested whether assessments that incorporate situational strength and trait-relevant cues are useful in a hiring context. Situational strength refers to the signals provided by the environment about the desirability of potential behaviors (for example, a funeral is a strong situation because there is a strict behavioral script), and trait-relevant cues are those that activate trait-relevant behaviors (such as a gun activating aggressive behavior). The main goal of this study was to test whether moderate strength situations with trait-relevant cues are better able to separate those who are high and low in adaptability. There was partial support for the idea that those high in adaptability exhibit the most adaptive performance under these situations. Implications for the use of situational strength and contextualization in hiring are discussed.

48. Fate of A 5'-Aldehyde Derived from C5'-Oxidation in Single-Stranded Oligonucleotides

Shin Hae Cho, Amanda Bryant-Friedrich

Medicinal and Biological Chemistry, University of Toledo

Oxidative stress exerted on DNA by endogenously produced reactive oxygen species results in DNA strand breaks at deoxyribose sugar moieties by abstraction of hydrogen atoms to generate carbon-centered radicals. The 5'-aldehyde lesions, formed when a 5' hydrogen is targeted, is electrophilic in nature allowing nucleophiles within the cellular environment to react to form adducts of biological molecules, such as aromatic furfural, yet the factors that facilitate this decomposition are unknown. In order to determine these conditions as well as other products that form from this intermediate, the 5'-aldehyde was exposed to various environments including variations in pH. This work is designed to determine if the 5'-aldehyde damage lesion can act as a viable biomarker of oxidative stress. In addition, intermediates formed during the process of its decomposition will be studied to determine how they contribute to the composition of the internal exposome generated through oxidative damage to nucleic acids.

49. Preparation and Analysis of A 5'-Aldehyde Derived from C5'-Oxidation of DNA

Shin Hae Cho, Amanda Bryant-Friedrich

Medicinal and Biological Chemistry, University of Toledo

Oxidative stress exerted on DNA by endogenously produced reactive oxygen species results in DNA strand breaks at deoxyribose sugar moieties by abstraction of hydrogen atoms to generate carbon-centered radicals. The 5'-aldehyde lesions, formed when a 5' hydrogen is targeted, is electrophilic in nature allowing nucleophiles within the cellular environment to react to form adducts of biological molecules, such as aromatic furfural, yet the factors that facilitate this decomposition are unknown. In order to determine these conditions as well as other products that form from this intermediate, the 5'-aldehyde was exposed to various environments including variations in pH. This work is designed to determine if the 5'-aldehyde damage lesion can act as a viable biomarker of oxidative stress. In addition, intermediates formed during the process of

its decomposition will be studied to determine how they contribute to the composition of the internal exposome generated through oxidative damage to nucleic acids.

50. Role of RNase L-Filamin A Intervaction In Prostate Cancer

Shubham Dayal, Malathi Krishnamurthy
Biological Sciences, University of Toledo

Prostate cancer is the second leading cause of cancer-related death in men in the U.S. Hereditary Prostate Cancer accounts for 43% of early onset cases and 9% of all cases of cancer. Positional cloning and linkage studies mapped Hereditary Prostate Cancer 1 to an antiviral gene; RNase L. RNase L reduces cell migration and cell attachment on various extracellular matrices. Cells with reduced RNase L levels promote cell surface expression of integrin $\beta 1$ which plays an important role in cell migration and also secrete higher levels of MMP-2 and -9. Both RNase L and Filamin A bind to AR and nuclear translocation of cleaved Filamin A represses AR-responsive genes. Our results suggest that RNase L may play a tumor suppressor role in prostate cancer by suppressing expression of AR-response genes and regulating cell motility.

51. The Growth Mechanism and Phosphorus Doping of MnAs Nanoparticles: Optimizing Properties for Magnetic Refrigeration

Surangi Hasitha Pimmachcharige, Stephanie Brock
Chemistry, Wayne State University

MnAs is a promising material for room temperature magnetic refrigeration applications due to the large magnetic entropy change associated with the first order phase transition, but its high thermal hysteresis prohibits efficient cycling and the sharpness of the transition limits the temperature range for operation. Reduction of particle size and doping of MnAs can be used to tune the phase transition temperature and degree of hysteresis, but size control alone can be challenging if little is quantitatively known about crystallization process. Here we demonstrate that MnAs nanoparticle growth occur with distinguishable shape and size evolution, making it feasible to control particle size and elemental composition. The effect of size and composition on the phase change temperature is probed by PXRD and the effect of size on the thermal hysteresis is evaluated by magnetic susceptibility measurements. The morphology and the composition of the nanoparticles are analyzed by electron microscopy techniques.

52. Analysis of Water Quality, Water Scarcity and Leading Factors to Using Contaminated Water Sources in Rural Communities

Tula Ngasala, Susan Masten

Civil and Environmental Engineering, Michigan State University

Water scarcity and poor water quality are major challenges facing many poor rural communities. Surface and groundwater sources are highly polluted due to poor animal waste management, water resource management and lack of modern agricultural practices. Families' well-being are being affected due to poor access to water sources, seasonal availability and their economic status. The water quality of surface, shallow wells and deep wells in Naitolia Village was determined to identify the extent of contamination. Water Quality Index (WQI) for pH, nitrate, nitrite, ammonia and turbidity was used to show the overall water quality for each water source. Households were surveyed to identify factors that contribute to poor access and reliability to water sources. Results showed the maximum contaminant levels from all water sources exceeded W.H.O standards. Survey responses showed 81% of this community use highly contaminated water sources. Although deep wells are the least contaminated, after considering other factors such as distance to water sources, economic status, seasonal availability and water quality, it was found that, in terms of access and quantity, boreholes were the least reliable, shallow wells were the most reliable followed by surface water. Improving the existing water resources is one of the sustainable solutions to improve health and well-being of families of Naitolia

53. The Effect of Oil Palm Phenolics (OPP) on Urinary Metabolomic Profile in Atherogenic Diet Induced Rat Model Of Alzheimer's Disease (AD)

Yan Wu, Smiiti Gupta

Nutrition and Food Science, Wayne State University

In this study, we used the metabolomic approach to investigate the effect of OPP, an oil palm phenolics, on change in metabolism in high cholesterol diet induced rat model for Alzheimer's disease. Thirty two male Brown Norway rats were randomly assigned to 4 groups. Urine samples were collected once a month for 6 months. Proton nuclear magnetic resonance (¹H NMR) spectra were processed and subjected to multivariate data analysis (SIMCA P+). Principal Component Analysis (PCA) and partial least squares-discriminant analysis (PLS-DA) score plots showed clear separation among all four groups. The metabolites responsible for the differences in the metabolomic profile were quantified using CHENOMX NMR metabolite database. Some metabolites from the tryptophan-kynurenine-quinolinic pathway were brought down significantly

in the treatment group. Our data indicates that dietary OPP or curcumin have potential benefit in AD. In addition, specific urinary metabolites may serve as non-invasive biomarkers for progression of neurodegenerative diseases including AD.

54. Sex-Dependent Effects of Isolation-Rearing on Pre-Pulse Inhibition of Acoustic Startle Responses

Yasir Saber, F Scott Hall
pharmacology, university of Toledo

Social isolation of mice after weaning has been suggested to produce a variety of pathological behavioral phenotypes, including impaired pre-pulse inhibition (PPI) of acoustic startle. PPI deficits model impairments in cognitive function in schizophrenia. Males and females may respond differently to isolation-rearing, indicating differential propensity to develop particular psychiatric conditions in response to early adverse experiences. 21-day-old male and female C57BL/6J mice (N=10 / condition) were reared in isolation or in social groups for 8 weeks. Acoustic startle responses were measured across a range of stimulus intensities, 70 to 130 dB, and PPI was assessed at 3 PPI magnitudes (3, 6, and 12 dB above background– 65 dB) on a 120 dB stimulus. PPI was impaired in male, but not female, isolation-reared mice. While, other studies show that isolation-rearing increases anxiety and depression in female. Collectively, these data suggest that different sex-dependent behavioral phenotypes are produced by isolation-rearing.

55. Molecule Dynamics Simulation on Substrate Transport on Alpha-helix Peptide for Multistep Catalysis

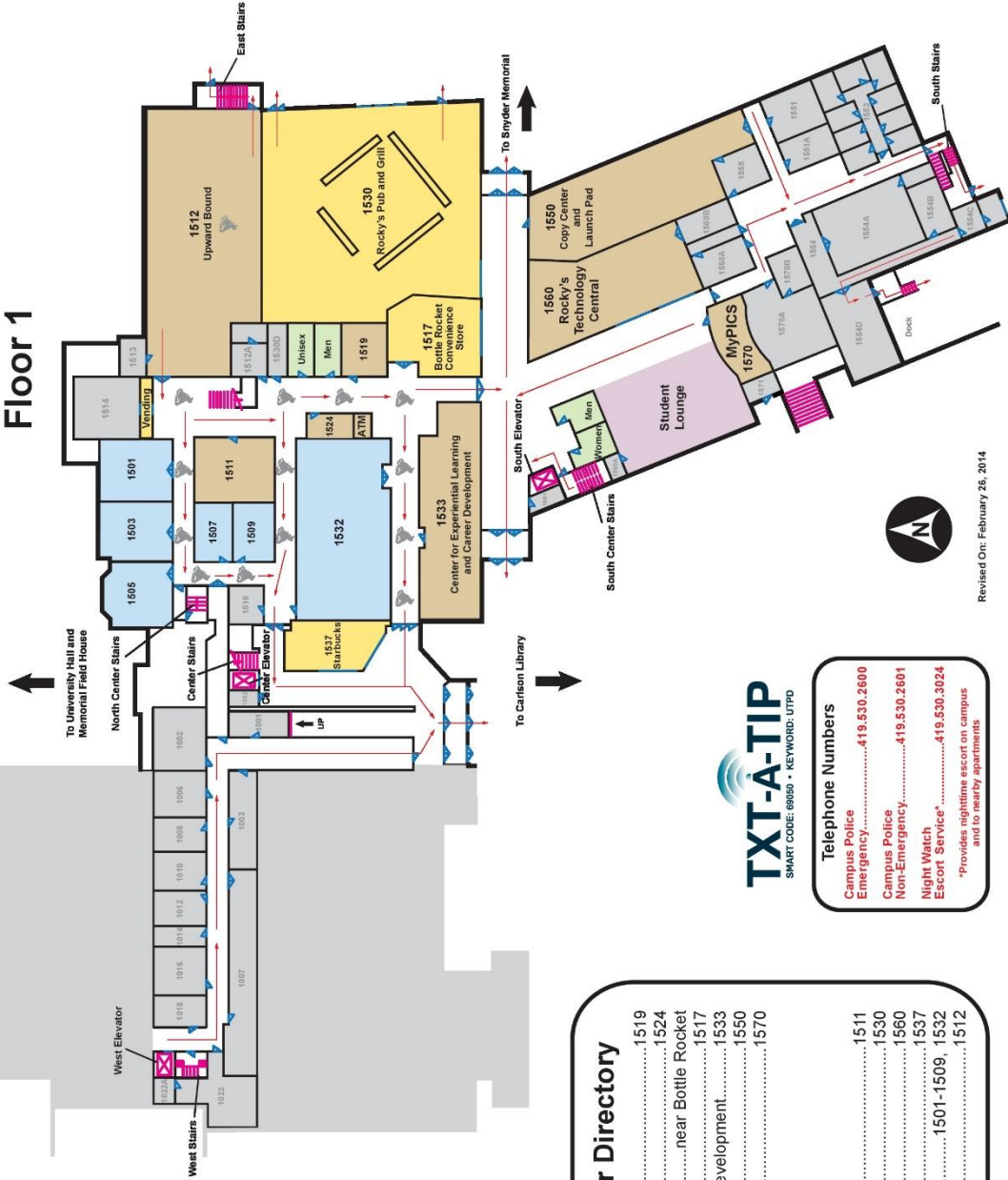
Yuanchao Liu, Scott Calebrese Barton
Chemical Engineering and Materials Science, Michigan State University

Substrate channeling is a key step in multi-step catalysis, involving intermediate transportation between catalysts (e.g., enzyme, metal, TEMPO). [1] Polypeptides are the basic components of protein biomolecules and can also be the enzyme linker, contributing to substrate oxidation either through bulk or surface diffusion. [2]. Therefore, the study on intermediate/peptide interaction can give us further understanding on catalysis cascade. In this project, we are going to study the surface transportation of intermediate molecules on α -helix peptide [3], aiming to discover and design appropriate secondary structure favorable to substrate channeling or even tunneling effect. Based on this, the surface diffusivity, sorption energy and adsorption/desorption rate of intermediate molecules will be calculated.



Welcome to the Student Union!

Floor 1



- Food/Dining**
- Meeting Rooms**
- Restrooms**
- Student Lounges**
- Student Organizations**
- Student Services**
- Tornado Safe Waiting Area**
- Fire Evacuation Route**
- Stairs/Elevators**

Student Union 1st Floor Directory

Aramark Catering Office.....	1519
Aramark Human Resources.....	1524
ATMs.....	near Bottle Rocket
Bottle Rocket Convenience Store.....	1517
Center for Experiential Learning and Career Development.....	1533
Copy Center and Launch Pad.....	1550
MyPICS.....	1570
Meal Plans	
Parking Permits	
ID/Rocket Cards	
Cellular Services	
Office Space.....	1511
Rocky's Pub and Grill.....	1530
Rocky's Technology Central.....	1560
Starbucks Coffee Company.....	1537
Student Organizations.....	1501-1509, 1532
Upward Bound.....	1512

TXT-A-TIP
 SMART CODE: 68650 • KEYWORD: UTPD

Telephone Numbers

Campus Police Emergency.....419.530.2600
 Campus Police Non-Emergency.....419.530.2601
 Night Watch Escort Service*.....419.530.3024



*Provides nighttime escort on campus and to nearby apartments



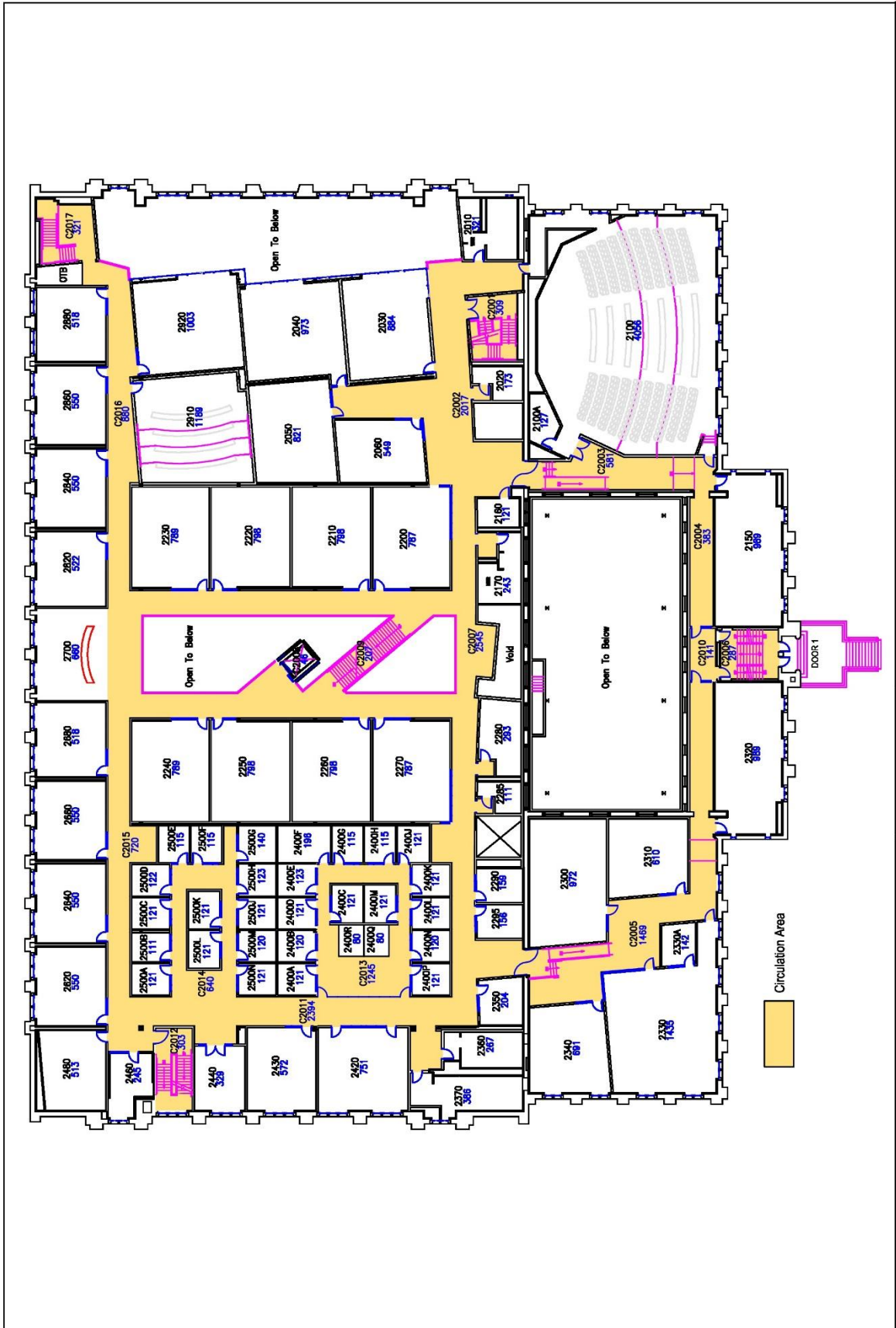
Revised On: February 25, 2014



Map of Memorial Field House: First Floor



 THE UNIVERSITY OF TOLEDO <small>1872</small>		Facilities Information Systems Facilities & Construction Revised On: November 19, 2013	
Building Name: Memorial Field House (FH)		Structure ID: 05 Main Campus	
Level 1, 5 Floors Total			
Numeric Scale: 1" = 40'			

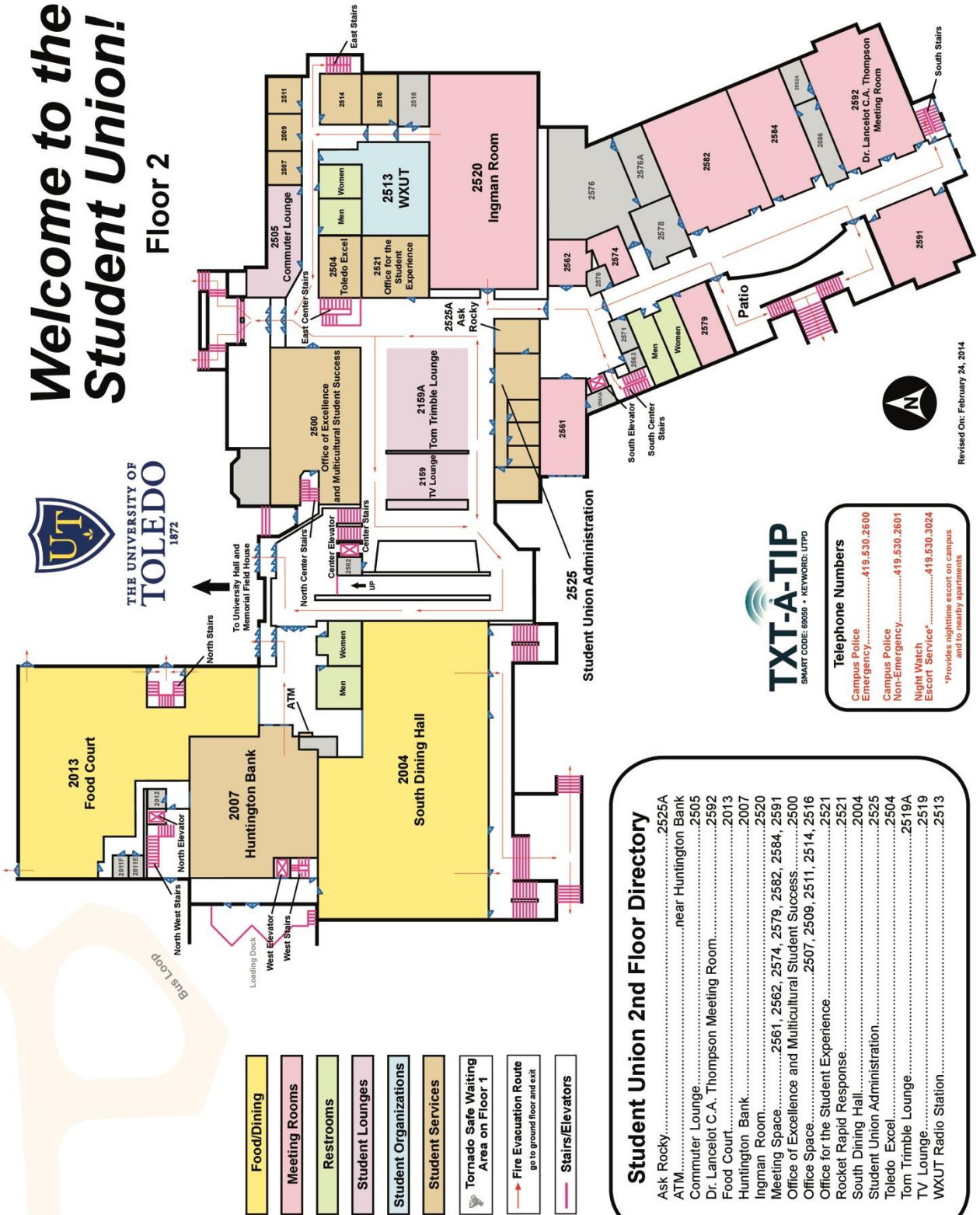
Map of Memorial Field House: Second Floor



 THE UNIVERSITY OF TOLEDO <small>1872</small>		Facilities Information Systems Facilities & Construction Revised On: November 19, 2013	
Building Name: Memorial Field House (FH)		Structure ID: 05	
Level 2, 5 Floors Total		Main Campus	
Numeric Scale: 1" = 40'			

Welcome to the Student Union!

Floor 2



Revised On: February 24, 2014



Telephone Numbers	
Campus Police	419.530.2600
Emergency	419.530.2600
Campus Police	419.530.2601
Non-Emergency	419.530.2601
Night Watch	419.530.3024
Escort Service*	419.530.3024

*Provides nighttime escort on campus and to nearby apartments

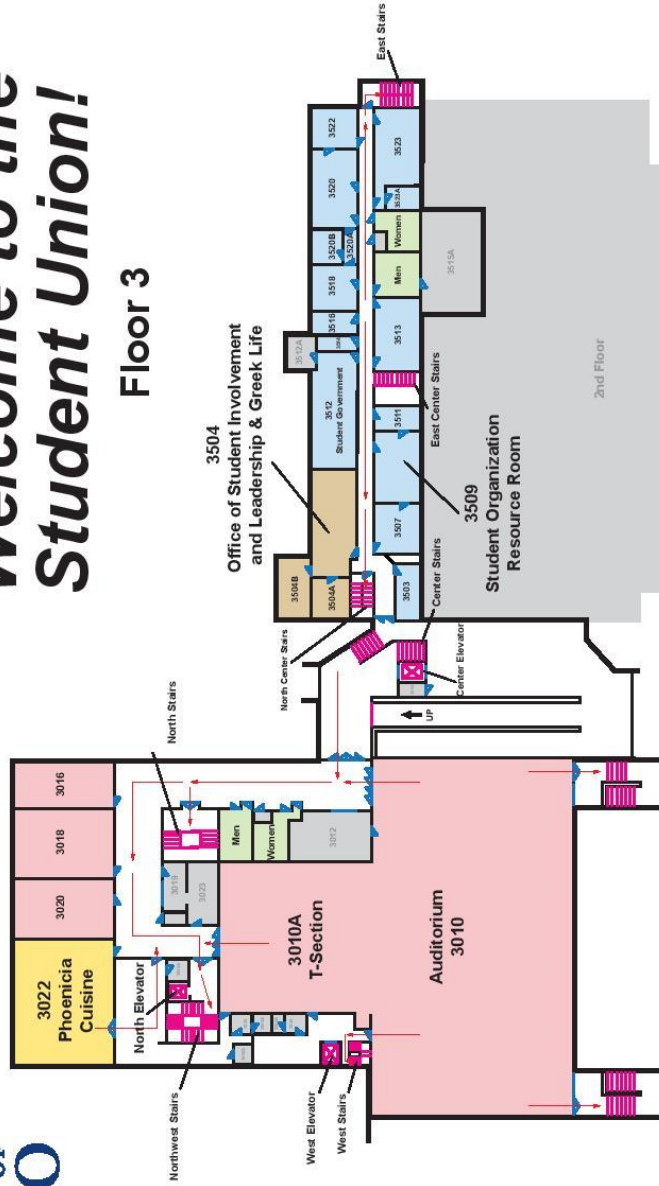
Student Union 2nd Floor Directory

Ask Rocky	2525A
ATM	near Huntington Bank
Commuter Lounge	2505
Dr. Lancelot C.A. Thompson Meeting Room	2592
Food Court	2013
Huntington Bank	2007
Ingman Room	2520
Meeting Space	2561, 2562, 2574, 2579, 2582, 2584, 2591
Office of Excellence and Multicultural Student Success	2500
Office Space	2507, 2509, 2511, 2514, 2516
Office for the Student Experience	2521
Rocket Rapid Response	2521
South Dining Hall	2004
Student Union Administration	2525
Toledo Excel	2504
Tom Trimble Lounge	2519A
TV Lounge	2519
WXUT Radio Station	2513



Welcome to the Student Union!

Floor 3



- Food/Dining
- Meeting Rooms
- Restrooms
- Student Lounges
- Student Organizations
- Student Services
- Tornado Safe Waiting Area on Floor 1
- Fire Evacuation Route
go to ground floor and exit
- Stairs/Elevators

TXT-A-TIP
SMART CODES: 6868 • KEYWORD: LITPD

Telephone Numbers

Campus Police
Emergency.....419.530.2600

Campus Police
Non-Emergency.....419.530.2601

Night Watch
Escort Service*.....419.530.3024

*Provides nighttime escort on campus and to nearby apartments

Student Union 3rd Floor Directory

Auditorium.....	3010
Greek Life.....	3504
Meeting Rooms.....	3016, 3018, 3020
Office of Student Involvement and Leadership.....	3504
Phoenicia Cuisine.....	3022
Student Government.....	3512
Student Organizations.....	3503-3523
Student Organization Resource Room.....	3509
T-Section.....	3010A



Revised On: June 30, 2015

The University of Toledo

Welcome to Main Campus!

2801 West Bancroft Street, Toledo OH 43606

41° 39' 44" (N) 83° 36' 51" (W)

www.utolledo.edu



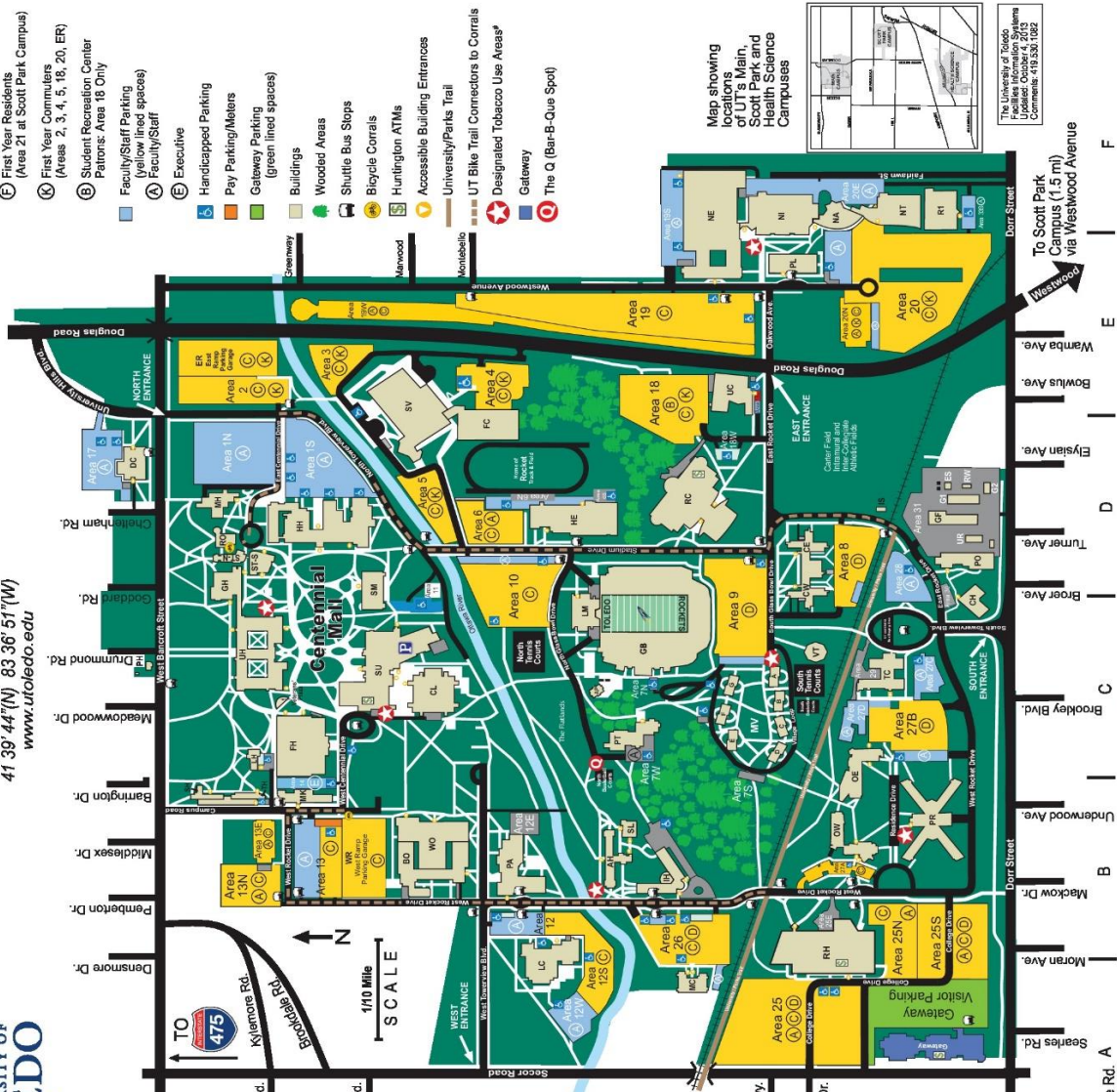
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BUILDING DIRECTORY

AH	Academic House	B3	Booster Alumni Pavilion
AP	Koester Alumni Pavilion	B2	Booster Alumni Pavilion
BC	Booster Alumni Pavilion	B2	Booster Alumni Pavilion
CH	Child Care Center	C2	Child Care Center
CL	Carleton Library	C2	Carleton Library
CW	Carter Hall West	D4	Carter Hall West
DC	Driscoll Alumni Center	D1	Driscoll Alumni Center
ER	East Ramp Parking Garage	E1	East Ramp Parking Garage
EH	East Hall	E1	East Hall
FH	Memorial Field House	F2	Memorial Field House
GB	Glass Bowl Stadium	C3	Glass Bowl Stadium
GS	Grounds and Fleet Services	D5	Grounds and Fleet Services
GH	Gillham Hall	D3	Gillham Hall
HE	Health Education Center	D3	Health Education Center
HH	Horton International House	B3	Horton International House
IS	Intramural Storage	D4	Intramural Storage
LC	Law Center	A3	Law Center
LH	Libbey Hall	C1	Libbey Hall
LM	Lamar Athletic Complex	C3	Lamar Athletic Complex
MH	McKinnon Hall	D1	McKinnon Hall
MV	James D. McComas Village	B2	James D. McComas Village
NA	Nilschke Auditorium	F4	Nilschke Auditorium
NE	North Engineering	F4	North Engineering
NE	Nilschke Technology	F4	Nilschke Technology
NT	Commercialization Complex	F4	Commercialization Complex
OE	Ottawa House East	B4	Ottawa House East
OW	Ottawa House West	B4	Ottawa House West
PA	Center for Performing Arts	B3	Center for Performing Arts
PL	Palmer House	E4	Palmer House
PO	Plant Operations	D5	Plant Operations
PT	Parks Tower	C3	Parks Tower
PR	Presidents Hall	B5	Presidents Hall
RT	Research & Tech. Complex 1	F5	Research & Tech. Complex 1
RT	Research & Tech. Complex 2	F5	Research & Tech. Complex 2
RH	Ritter Hall	B4	Ritter Hall
RO	Ritter Astrophysical Research	B1	Ritter Astrophysical Research
SC	Scott Hall	B1	Scott Hall
SL	Sullivan Hall	B3	Sullivan Hall
SM	Snyder Memorial	D2	Snyder Memorial
ST	Stratman Hall South	D1	Stratman Hall South
ST	Stratman Hall North	D1	Stratman Hall North
SU	Student Union	E2	Student Union
SU	John F. Savage Arena	E2	John F. Savage Arena
TC	Transportation Center	E1	Transportation Center
TH	Tucker Hall	E1	Tucker Hall
UH	University Hall	C1	University Hall
UH	University Recycling	C4	University Recycling
VT	Varsity "V" Pavilion	B2	Varsity "V" Pavilion
WR	West Ramp Parking Garage	B2	West Ramp Parking Garage

MAP KEY

- Visitor Parking Permits
- Student Parking (white lined spaces)
- Commuters, Other Than First Year
- Residents, Other Than First Year
- First Year Residents (Area 21 at Scott Park Campus)
- First Year Commuters (Areas 2, 3, 4, 5, 18, 20, ER)
- Student Recreation Center (Palmer: Area 18 Only)
- Faculty/Staff Parking (yellow lined spaces)
- Executive
- Handicapped Parking
- Pay Parking/Meters
- Gateway Parking (green lined spaces)
- Buildings
- Wooded Areas
- Shuttle Bus Stops
- Bicycle Corral
- Huntington ATMs
- Accessible Building Entrances
- University/Parks Trail
- UT Bike Trail Connectors to Corral
- Designated Tobacco Use Areas*
- Gateway
- The Q (Bar-Que Spot)



Map showing locations of UT's Main, Scott Park and Health Science Campuses



The University of Toledo
Facilities Operations Systems
Smart Campus 4080/4090/4100
Comments: 419.530.1082

To Scott Park Campus (1.5 mi) via Westwood Avenue

Tobacco use is restricted to designated use areas only
UT's Night Watch Escort Service Call 419.530.3024



*Areas 25 to 26 only with alternate safety Smart Campus 4080/4090/4100
Please Use Safely

Libbey Hall Student Services

- Undergraduate Admission
- Direct from High School Students

Rocket Hall Student Services

- Academic Access, Office of (1820)
- Admission, Undergraduate (1300)
- Adult Students
- Military Students
- Counseling Center (1810)
- Loans/Special Accounts (1850)
- Rocket Solution Central (1200)
- Financial Aid/Scholarships
- Registration
- Student Account Information
- Graduate/Transcripts
- Graduation Information

STUDENT UNION STUDENT SERVICES

- College of
- C.A.L.L. Undergrad. Degree Programs
- Military Service Center (1529)

ADMINISTRATION DIRECTORY

Office of the President	UH 3500
Chancellor and Executive Vice President for Biosciences and Health Affairs	MLB 213*
Provost and Executive Vice President for Academic Affairs, Main Campus	UH 3510
Executive Director for	
Admission, Equity, and Diversity	UH 3700G
Vice President for Administration	UH 3580
Vice President for Finance	LR 2110P**
Vice President and General Counsel	UH 3520
Vice President for Governmental Relations	UH 3340
Vice President for Information Technology/CIO	UC 1000B
Vice President for Institutional Advancement, Research and Economic Development	DC 1001
Vice President for the Student Experience	UH 3630
Director of Athletics	SV 1110
Office of Board of Trustees	UH 3580

COLLEGE OF THE DEAN

College of Adult and Lifelong Learning	UH 1060
College of Business and Innovation	ST-S 5017
College of Communication and the Arts	VA 1200***
Judith Herb College of Education	GH 3100K
College of Engineering	NI 5012
College of Graduate Studies	UH 3240
College of Health Sciences	HH 3302
College of Human Services	MK 2000
College of Languages, Literature and Social Sciences	UH 3160
College of Law	LC 2000
College of Medicine and Life Sciences	MLB 213*
College of Natural Sciences and Mathematics	WO 2246
College of Nursing	COB 4431*
College of Pharmacy and Pharmaceutical Sciences	HEB 145*
College of Social Justice and YouCollege	UH 3210
Online Learning	RH 1840
Exploratory Studies	FH 3000
Health Science Campus	RH 1840
*Scott Park Campus	
**Center for the Visual Arts at the Toledo Museum of Art	

