Celebrating and recognizing research achievement

Saturday, May 1
Ohio Northern University
McIntosh Center
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Welcome!

Ohio Northern University welcomes you to Ada.

Northern’s Fifth Student Research Colloquium is designed to provide students with the opportunity to discuss their research and gain valuable presentation experience. This year sees numerous presenters from the University.

The colloquium’s presenters represent a multitude of disciplines and employ research methods from across the scholarly spectrum. Results are exhibited via posters and papers employing varied multi-media technology.

We hope you will take the time while you are here to explore the knowledge of your peers and share your own experiences and insights with them. We hope, as well, that you will develop some new professional associations and networks and enjoy the company of your colleagues.

Cordially,

Kendall L. Baker
President
Our Thanks

The Colloquium Planning Committee would like to extend its gratitude to all members of the ONU community who have helped to make the 2010 Student Research Colloquium such a success.

Special mention goes to Amy Prigge, Brian Paris, and Toma Williams from the Office of Communications and Marketing and to Erin Chandler and Laurie Melin of the Office of Admissions for their efforts in promoting the colloquium across and beyond the Ohio Northern campus.

Additional thanks go to all the student presenters and their faculty mentors who ensure that scholarly research and deep learning is vital to an Ohio Northern education.

The committee members would also like to thank the Office of Admissions and the Getty College of Arts and Sciences for their generous funding of this event.

Finally, we thank all friends and family of and visitors to the Northern community and welcome your presence today.

Colloquium Committee

Dr. Robert Alexander  
*Department of History, Politics and Justice*

Dr. Tevye Celius  
*Department of Chemistry and Biochemistry*

Dr. Mark Dixon  
*Department of Philosophy and Religion*

Ms. Mary Drzycimski-Finn  
*College of Arts & Sciences, Committee Chair*

Ms. Nicole Heidelberg  
*Student Representative, Psychology*

Dr. David McClough  
*College of Business Administration*

Ms. Jennifer Pelton  
*Student Representative, Language Arts Education*

Dr. Adam Stienecker  
*Department of Technological Studies*

Dr. Amy Stockert  
*College of Pharmacy*
Colloquium Schedule

All Colloquium activities take place in the McIntosh Center of Ohio Northern University.

9:30-11 a.m.  
Colloquium Check-In  
Main Lounge

10-10:15 a.m.  
Opening Remarks/Welcome from President Baker  
Main Lounge

10:30 a.m.-Noon  
Paper Presentations: History, Politics and Civics  
Wishing Well

Paper Presentations: Psychology and Sociology  
Conference Room 7

Poster Presentations: STEM* Disciplines  
Activities Room

Noon-1 p.m.  
Lunch

12:30-2 p.m.  
Colloquium Check-In  
Main Lounge

1:30-3 p.m.  
Poster Presentations: History, Social Sciences and Business  
Activities Room

1:30-3:30 p.m.  
Paper Presentations: Humanities Disciplines  
Wishing Well

Paper Presentations: STEM* Disciplines  
Conference Room 7

3:30 p.m.  
Colloquium Concludes

*STEM refers to the disciplines of science, technology, engineering and mathematics.
Paper Presentation Schedule – Morning Sessions
10:30 a.m.-Noon

**Psychology and Sociology**
Conference Room 7
The Effect of Humor and Celebrity Endorsement on Attitude toward an Advertisement and Purchase Intent
Delaney Banas, Jacki Hillis, Warren Burless

More than Lights, Sirens, and a Box on Wheels: Symbolic Interactionism and the Emergency Medical Services System
Brianne N. Clark

A Devil in Our Consciousness: The Paradoxes of Modern Communications
Richard A. Brinkman

Double Standard: The Sociology of Jockeys and Eating Disorders
Samantha Anne Licata

**History, Politics and Civics**
Wishing Well
The Geopolitics of Water: Conflict and Instability in Africa and the Middle East
Leeann Marie Sullivan

Machiavelli's Prince: The Melee over the Motive
Matthew James Allen

DNA: The Ultimate Determination of Innocence
Clara Harrod

Service-Learning and Social Justice: Engaging and Extending Beyond the Classroom
Jenny Pelton

Paper Presentation Schedule – Afternoon Sessions
1:30-3:30 p.m.

**STEM Disciplines**
Conference Room 7
Perturbations in the Aerospace Sequence of Attitude Determination Using Quaternions
Kevin Earnest

Design and Construction of a Mobile Surveillance Robot
George Font, Brad Stahl

Energy Consumption Reduction in Industrial Robots
Cory Bryan

Virtual Simulation in Industry
Courtney Rose Johnson

Regulator of G Protein Signaling Proteins Modulate Protection from Ischemic Injury in the Mouse Heart
Nathaniel W. Mabe

**Humanities Disciplines**
Wishing Well
Digging Up the Undead: Compiling a Comprehensive Annotated Bibliography on Vampire Media
Samantha Ann LaChey, Merrill C. Miller, Cailey A. Williams

More than Just a Pretty Face: How Feminist Literature Redefines Beauty in Contemporary American Society
Merrill Cameron Miller

The Departure of Catalan and Its Impact on Contemporary France
Nicole Amadon

Hate Crimes and “the Other”
Victoria L. Dickman

Fitted for Multi-Site
Tiffanie A. Shanks
## Poster Presentation Schedule – Morning Session
10:30 a.m.-Noon

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Courtney M. Hetrick, Kathleen Lifer |
| 2  | Gutter Cleaning System  
Drew A. Robinson, Nicholas Mascia |
| 3  | Design and Construction of a Mobile Surveillance Robot  
George Font, Eric Holbrook |
| 4  | Efficiencies of Factorization Algorithms on RSA Encryption  
Axel Brandt, Nicholas Erickson |
| 5  | The Greatest Prime Factor Function and Some Applications  
Greg Back |
| 6  | Synthesis of Metal Alkoxide Precursors to Inorganic/Organic Composite Materials  
Jonathan Syrigos, Steve Kennedy |
| 7  | beta-Ketophosphonates: Studies towards the Synthesis of Botcinic Acid  
Ryan Merk, Aaron Baker |
| 8  | Multi-Exponential Analysis of Labile Europium Complexes in Polymers  
Lukas Kromer |
| 9  | Stereoselective Tin-free Radical Fragmentation Reactions: Preparation of 1,4-dicarbonyl Compounds  
Elizabeth Buenger |
| 11 | Preparation of Chiral 1,5-diazocyclooctanes: Application as Chiral Ligands and Catalysts in Asymmetric Organic Synthesis  
Derek J. Rhoades |
| 12 | Effects of Selenium on Glutathione Peroxidase Activity  
Shannon D. Bruewer |
| 13 | Response of Colon Cancer Cells to Selium and Cis-platinum Exposure  
Kara L. Amend |
| 14 | Analysis of Branching in the Lycophyte genus Selaginella  
Eric R. Schultz |
| 16 | Improved Antinociception and Decreased Opioid Withdrawal in Mice Lacking RGS Protein Activity at Gi2  
Amanda R. Hoersten, Nicholas E. Wolters |
| 17 | Inhibition of RGS Proteins as a Novel Strategy for Antidepressant Drug Therapy  
Kelly A. Jensen, Crystal F. Clemans |
| 18 | MDMA-induced Thermogenesis Is Attenuated by Atrial Natriuretic Peptide NPR-A Receptor Antagonist Anantin  
Karen E. Thatcher |
| 19 | MDMA-induced Thermogenesis Is Mediated by Fatty Acid Uptake in Skeletal Muscle  
Jeremy A. Ebert |
| 20 | Public Health Content in U.S. Doctor of Pharmacy Programs: Results from Surveys of Students and Faculty  
Lauren N. Anderson |
**Poster Presentation Schedule** – Afternoon Session
1:30-3 p.m.

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Colloquium Abstracts – Alphabetically by Title


The way in which individuals communicate has always been an important part of attaining any understanding of social order or progress. This statement is extremely important in itself, because whether we conceptualize order or progress, according to the power struggles of economics asserted by Marx, the development of social solidarity as argued by Durkheim, or the description of self and society as “twin-born”, as Cooley and Mead contend, all social facts seem to arise in conjunction with, or as a function of, communication. Specifically, my direction in this paper seeks to discover if modern communications technologies bring individuals together as often stated, or on the other hand, if they produce an isolation and subversion of the masses. Of utmost importance in this paper is the manifestation of modern social communication in today’s virtual technologies. Important technologies here are the mediums of the Internet and personal smart phones, which are becoming embedded in how we carry on the majority of social life. Issues will circle around what the social networking communities of Facebook and Myspace mean for traditional dynamics of interaction, what prepackaged anagamic dialogue in text messaging (i.e. lol, omg, and others) tells us about our society, and how the distractions and entertainments offered by new communications technologies in general create a unilaterality of thought. All these issues will be approached from a largely theoretical background in hopes of creating a structured theoretical springboard for further empirical testing. Major theorists covered in this paper include Karl Marx, Herbert Marcuse, and Charles Horton Cooley.

African American Firsts in Baseball. Katherine Finck, Junction City, OH. Research Advisor & ONU Sponsor: Dr. Russ Crawford.

In the history of the United States of America, African Americans always had more problems accomplishing anything because of their skin color. No one wanted to hire them, so they were unable to achieve many of their goals. Because of the difficulties due to their ethnicity, African American firsts were very important in the history of baseball. Through online research, this segment of baseball history has been prepared in such a way as to educate the readers on African American firsts. There are descriptions of African American players who achieved these firsts as well as a description of some of the earlier Negro leagues. Through research, it can be said that African American baseball players are just as good, though they have more to overcome, than other baseball players.

All-American Girls Professional Baseball League. Samantha LaChey, Troy, OH. Research Advisor & ONU Sponsor: Dr. Russ Crawford.

This poster will encompass the history of the All-American Girls Professional Baseball League.

Analysis of Branching in the Lycophytes Selaginella. Eric R. Schultz, Fort Wayne, IN. Research Advisor: Dr. Mike Scanlon, Cornell University. ONU Sponsor: Dr. Linda Young.

The subphylum Lycophytes represents an analogous branch of derived land plants different from spermatophytes. The genus Selaginella is of interest because it independently recruited vasculature, heterospory, and organography. Apical cell bifurcation is responsible for branching in lycophytes, unlike axillary meristems in spermatophytes. Strahler stream order analysis quantified branching of 54 S. kraussiana samples to derive a pattern of bifurcation. JMP 8 was employed for statistical analysis, where logarithmic correlation coefficients averaged 0.988. Phloroglucinol (1% in 95% EtOH acidified with HCl) staining of mature xylem in dark field microscopy predicted bifurcation. Sections were fixed in FAA (50% 95% EtOH, 5% Glacial acetic acid, 10% formalin, 35% DI H2O), embedded in paraffin, sectioned at 5 m, bound to Histobond slides, and deparaffinized in absolute ethanol and xylene. Three drops of phloroglucinol were applied to each, reacting approximately 30 seconds before viewing. In situ hybridizations of S. moellendorfii were performed. Sections were prepared as before, substituting 9 m sections. Median longitudinal sections were hybridized with the lipid transfer protein (LTP) probe. LTP is expressed differentially in Z. mays, with the subordinate axillary meristem expressing LTP in the L1, lacking in the primary shoot apical meristem. S. moellendorfii expressed LTP in both meristems.

beta-Ketophosphonates: Studies towards the Synthesis of Botcinic Acid. Ryan Merk, Cleveland, OH. Aaron Baker, Cleveland, OH. Research Advisor & ONU Sponsor: Dr. Brian J. Myers.

Botcinic acid is a phytotoxic metabolite isolated from a strain of the plant pathogen botrytis cinerea. We will present our work towards completing the synthesis of this natural product including our efforts on the synthesis of novel beta-ketophosphonates. We will also report the efficient synthesis of the lipophilic side chain on position 3 of the tetrahydropyran ring was completed over 3 steps.


Ohio Northern’s nursing department has many mannequins that need to be re-engineered for efficiency and durability. Specifically the mannequin Noelle, who simulates the final stages of pregnancy and giving birth, has problems with microphone placement, umbilical cord attachments, and baby connection points. The microphone was fixed by re-routing wiring and repositioning of the microphone. The umbilical cords will be fixed by re-designing the attachment sites to be sturdier and more accessible. If possible, the baby’s connection site to the motor will be fitted with a new part to improve the stability of the attachment to the motor. Both biomedical sciences and engineering applications were needed to fix the problems with the nursing mannequins. These improvements to the mannequins will allow students to listen to fetal heartbeats and practice infant delivery safely. The changes made will also ensure the sustainability and durability of the mannequin Noelle.

Design and Construction of a Mobile Surveillance Robot.
consequently are applied with the stigma of being an anorexic due to
Eating disorders are viewed as a psychological problem when a male jockey has an eating disorder as caused by external social forces, however there is a double
Eating disorders are viewed as a psychological problem

A cross-disciplinary team of eight engineering students have designed and prototyped a self-righting mobile surveillance device as an engineering capstone project. The goal was to create a device that can be controlled wirelessly to remotely assess situations which may be dangerous or inaccessible for the operator. The requirements for the device included a live video feed for the operator, a minimum control range, a minimum operating time, the ability to traverse common household flooring, and the ability to self-right itself without outside intervention. Mobility, durability, range, duration of use, and surveillance capability were all important aspects that defined the final design of the device. The device is currently in the process of being constructed and tested against the design requirements.

Digging Up the Undead: Compiling a Comprehensive Annotated Bibliography on Vampire Media. Samantha Ann LaChey, Troy, OH. Merrill C. Miller, McMurray, PA. Cailey A. Williams, Eastlake, OH.

This presentation will explore the processes used in researching the secondary sources of vampire literature and vampire-related media. These processes included focusing research parameters and establishing and utilizing consistent methodology, which resulted in the compilation of an annotated bibliography. This presentation will also address the subject matter encompassed throughout the media, current trends in vampire lore, the growth and popularity in vampire media, and the resulting research skills developed throughout the project.

DNA: The Ultimate Determination of Innocence. Clara Harrod, Fairfax, VA.

Since its discovery in the 1980s, DNA testing has become a remarkable tool within the criminal justice system, assisting with both convictions and exonerations. There are myriad cases existing today of individuals who have been exonerated by DNA, often through the help of The Innocence Project or other such legal organizations. DNA testing has spurred immense and powerful reform within the criminal justice system and has since obtained support on a federal level in the form of legislation. Through the science of DNA testing, the criminal justice system has been recreated and further strengthened – an initiative that continues today in many forms, with the same singular focus: to set the innocent free.

Double Standard: The Sociology of Jockeys and Eating Disorders. Samantha Anne Licata, North Royalton, OH.

Eating disorders are viewed as a psychological problem caused by external social forces, however there is a double standard when a male jockey has an eating disorder as opposed to an adolescent female. Females strive to keep their weight low due to distorted views of their body and consequently are applied with the stigma of being an anorexic or bulimic. Jockeys strive to keep their weight down in order to maintain the lowest weight possible so they can race horses. It has become a socially acceptable act in the world of horse racing to abuse one's body by means of starvation, purging, sauna abuse, or drug abuse. This receives a double standard because this exposed phenomenon is expected out of jockeys. Teenage girls prefer to keep their disordered eating a secret; thus it is viewed as a psychological problem that requires help. For jockeys this behavior is seen as acceptable because they either keep the weight down or never race again. Jockey's view their behavior as an occupational necessity and they understand it must be done. Furthermore, ideologies from classical social theorists Emile Durkheim and Charles Horton Cooley can be applied to explain the nature of this behavior.

Effects of Selenium on Glutathione Peroxidase Activity. Shannon D. Bruewer, North Ridgeville, OH.

Cis-platinum (Cis-Pt) therapy is normally ineffective for colon cancer. Glutathione peroxidase (GPox), is a selenium containing enzyme that decrease reactive oxygen species (ROS) levels. High ROS has been implicated in the decreased efficiency of Cis-Pt. The influence of Se on the effect of Cis-Pt on the HT-29 colon cancer cell line was tested using a three dimensional agarose culture model. Some cultures were untreated or pretreated with Se (0.33 g/ml) at day 0 followed by or in conjunction with Cis-Pt (3 and 6 g/ml) on day 4. On day 7, cells were lysed and assayed for GPox activity using Spectrophotometric assay monitoring NAD⁺ format at 340 nm. Total protein was also calculated with Se (0.33 g/ml) at day 0

Efficiencies of Factorization Algorithms on RSA Encryption. Axel Brandt, Rocky River, OH. Nicholas Erickson, Lima, OH.

RSA, an algorithm used for public key encryption, was developed to allow for the secure transmission of messages between two parties. In public key cryptography, a person, A, with knowledge of person B's public encryption key can send B a secure message that can only be decoded using the matching private key B has kept secret. This method ensures confidentiality of A's messages and allows for a digital signature to authenticate that A was the sender of the message to B. This project will compare the efficiencies of factorization algorithms when breaking RSA encryptions. A C++ program will randomly produce public keys for RSA and compare which factorization algorithm proves most effective over numerous repetitions at varying digit lengths.

Emotional Reaction to Face Message Consistency. LeighAnn Scheidler, Galion, OH. Elizabeth M Bajusz, North Royalton, OH.

This study will examine whether people remember negative or positive words better when they are paired with a congruent or non-congruent face. A 2x2 within-subjects design with the type of face (positive and negative) and word type (positive and negative) as the independent variables will be employed. The dependent variable is the number of words correctly recalled. Specifically, participants will view a series of 32 slides that depict faces paired with words and they will
be asked to rate each face/word pair for how emotionally arousing it is. The pairs are of four types, a positive face with a positive word, a positive face with a negative word, a negative face with a positive word, and a negative face with a negative word. After viewing all the pairs and engaging in a brief distracter task, participants will then be asked to recall as many of the words from the original show as they can. It is hypothesized that recall will be highest for the words from the negative face/ negative word condition. This is based on previous research that suggests that negative stimuli are recalled better than positive stimuli.


The technology field is a growing field that is becoming more concentrated in automation and robotics. With over 190,000 industrial robots in use, just within the United States, there is a significant cost in operating these automated systems. These robots consume on the order of 300kWh per day depending on many factors. Given that the average cost of electricity in the US for commercial accounts is about $0.05 per kWh, the total cost to operate these robots could exceed one billion dollars. If the energy consumed could be reduced by only 1%, the cost savings throughout the industry might be on the order of ten million dollars. With that in mind, one method for reducing the energy consumed by a robot is the style of programming. It is herein theorized that by reducing the speed and acceleration of each axis in the robot when it is not necessary to operate at full speed and full acceleration the total energy consumed during operation is decreased. We have begun preliminary testing to give us a basis of the amount of energy that could be potentially reduced through an adaptive programming style. This style will be able to determine the lowest energy consuming method to move between point a and point b in a specified amount of time. In order to effectively use our time and have the least amount of error in our results we have automated our testing system. This is done by having three robots communicate amongst themselves. This setup uses a “master” robot to coordinate the “slave” robots, so that they begin the different test sequences at a common start time, thus creating consistent data. The robots then control the data collection by means of a digital photo of three Kill-a-WattTM energy meters and then reset the energy meters and begin the next series of tests. Overall there are 240 data points representing 12 hour energy consumption tests. This paper will discuss the testing process and the implementation of our data into a programming method for industrial robots.

Fitted for Multi-Site. Tiffany A. Shanks, Troy, OH. Research Advisor & ONU Sponsor: Dr. Jennifer Walton.

The phenomenon of multi-site church structure has recently reached critical mass and is trending throughout denominations. One issue that many local parishes face when attempting to transform their organizational structure is deciding which model is most appropriate for the organization given its current state. By analyzing the organization from a cultural perspective, utilizing Philipsen’s Speech Codes Theory, this study will explore the process of organizational change based on organizational culture. Through interviews and structural analyses, common characteristics prior to transformation towards specific multi-site structural models should be identifiable. It is suspected that there will be certain organizational demographics that show trends in success and failure rates coordinated with different models. I anticipate that, although these characteristics form trends that can be used determining which structural model would be appropriate, each organization and its situation is unique and should be treated as such. The trends identified here will be applicable to a variety of organizations but should be viewed solely as guidelines, as opposed to rules.

Gutter Cleaning System. Drew A. Robinson, Columbus, OH. Nicholas Mascia, Pickerington, OH. Research Advisor & ONU Sponsor: Prof. Laurie Laird.

For our senior capstone project, a gutter cleaning system was to be designed. Currently, there is a robot on the market that is run by remote control. As a group, the goal is to take the current product and turn the remote control robot into an autonomous robot once the run cycle is started. In addition, new auger heads will be designed and tested for effectiveness. Once completed, it is anticipated that this robot will be more user friendly, safer, and perform as good as or better than the current product on the market.

Hate Crimes and “the Other.” Victoria L. Dickman, Middle Point, OH. Research Advisor & ONU Sponsor: Dr. Mark Dixon.

In this paper I seek to determine the nature of hate crimes, that is to say what makes an act a hate crime. After determining the nature of hate crimes I explore whether rape, which is not traditionally regarded as a hate crime, does in fact fit within the realm of crimes which are by nature hate crimes. Through application of the theories of the philosophers Iris Young, Catherine MacKinnon, Simone de Beauvoir, and Emmanuel Levinas, I will argue that rape is, by its very nature, a hate crime of against a socially constructed Other.

Improved Antinociception and Decreased Opioid Withdrawal in Mice Lacking RGS Protein Activity at G12. Amanda R. Hoersten, Delphos, OH. Nicholas E. Wolters, Maria Stein, OH. Research Advisor & ONU Sponsor: Dr. Jeffery N. Talbot.

Understanding the mechanisms that govern opioid signaling is important to improve therapy for pain while limiting abuse potential. Opioid signaling is controlled by regulators of G protein signaling (RGS) proteins. In vitro evidence suggests that partial efficacy mu opioid agonists such as buprenorphine are more sensitive to RGS protein regulation than those that are fully efficacious. To determine the relevance of this in vivo, transgenic "knock-in" mice were developed that express RGS-insensitive G12 (G184S; RGS-i). Buprenorphine was twice as efficacious in RGS-i animals compared to wild-type littermates in antinociceptive tests. However, morphine, a full agonist at mu opioid agonist and 8-Oh-DPAT, a full agonist at 5HT1A serotonin receptors, was equipotent in animals of either genotype. In contrast, when administered chronically (5-day treatment), both buprenorphine and morphine induced the same degree of tolerance in RGS-i and wild-type animals, indicating that mechanisms underlying opioid tolerance are insensitive to RGS regulation of G12. Importantly, withdrawal behaviors, such as naloxone-precipitated jumping, were substantially reduced in chronically-treated RGS-i mice relative to wild-type littermates. These data suggest that inhibition of RGS...

Research Advisor & ONU Sponsor: Dr. Sandra Hrometz.

The life-threatening hyperthermia associated with use of MDMA (3,4-methylenedioxymethamphetamine, Ecstasy) is believed to be mediated through lipidolytic release of free fatty acids and subsequent activation of uncoupling proteins in skeletal muscle mitochondria. Atrial natriuretic peptide (ANP) has been shown to have a strong lipidolytic effect via stimulation of natriuretic peptide receptor type A (NPR-A). The NPR-A antagonist (Anantin) was used to investigate the influence of ANP on MDMA-induced thermogenesis. Twelve male Sprague-Dawley rats were randomly assigned to the following 4 treatment groups: control (saline/saline), anantin (anantin/saline), MDMA (saline/MDMA), or experiment group (anantin/MDMA). Anantin (40 nM, ip) or saline was administered 15 minutes before MDMA (40 mg/kg) or saline administration. Rectal and gastrocnemius temperatures were taken at baseline and every 15 minutes, up to 60 minutes post-MDMA. Pretreatment with anantin attenuated MDMA-induced hyperthermia. Analysis of change in core Temperature Area Under the Curve (TAUC) yielded a significantly lower change in temperature in the anantin/MDMA group compared to the MDMA group (p<0.01). The animals receiving control (saline/saline) and anantin only (anantin/saline) treatment did not have a significant change in temperature during the experiment. These preliminary results support the role of ANP in the induction and propagation of MDMA-induced hyperthermia.

MDMA-induced Thermogenesis Is Mediated by Fatty Acid Uptake in Skeletal Muscle. Jeremy A. Ebert, Bucyrus, OH.

Research Advisor & ONU Sponsor: Dr. Sandra L. Hrometz.

Use of 3,4-methylenedioxymethamphetamine (MDMA) is associated with life-threatening hyperthermia secondary to activation of mitochondrial uncoupling protein (UCP) 3. There is evidence that increased free fatty acids (FFA) in skeletal muscle mitochondria facilitate the actions of UCP3 in thermogenesis. In the present study, we examined the role of insulin and FFA transport in MDMA-mediated thermogenesis. Diminished FFA access to skeletal muscle was accomplished two ways: 1) directly, by inhibiting uptake of FFA into skeletal muscle by the FAT/CD36 transporter and 2) indirectly, by decreasing endogenous insulin levels and therefore skeletal muscle FFA uptake. Inhibition of FFA uptake into SKM was accomplished by the FAT/CD36 inhibitor sulfo-N-succinimidyl oleate (SSO). Compared to MDMA alone, pretreatment with SSO attenuated the thermogenic response and the rise in plasma FFA observed following a challenge dose of MDMA. Rats treated with streptozotocin, an agent that destroys pancreatic beta cells, yields insulin deficient (or type 1 diabetic) animals. These type 1 diabetic animals exhibited a decreased thermogenic response to MDMA. Moreover, the attenuation of MDMA induced thermogenesis in insulin deficient animals was reversed with exogenous administration of insulin. These results support our hypothesis that FFA uptake into skeletal muscle is required for the thermogenesis induced by MDMA.

More than Just a Pretty Face: How Feminist Literature Redefines Beauty in Contemporary American Society. Merrill Cameron Miller, McMurray, PA.

Research Advisor: Dr. Jonathan Pitts, ONU. ONU Sponsor: Dr. Kathryn Cowles.
The purpose of this paper is to explore the effects that the media in contemporary American society has on women and their body image and contrast it to beauty as it is conceptualized by contemporary feminist literature. The paper employs research from a variety of sources, from articles and books on the problematic body image that women have internalized and how it negatively affects them through eating disorders and dangerous cosmetic surgeries to feminist essays on women’s reclamation of their own bodies and sense of identity. From that research, the paper discusses the ways in which women feel disempowered because their bodies do not align with the ideal female form that our society prizes. However, the paper concludes that there is also a counter-movement in feminist literature, particularly in young adult literature for teenage girls, that contradicts society’s ideal of beauty. This counter-movement reconceptualizes beauty as something based on a woman’s confidence and sense of identity.

More than Lights, Sirens, and a Box on Wheels: Symbolic Interactionism and the Emergency Medical Services System.
Brianne N. Clark, Barnesville, OH.
Research Advisor & ONU Sponsor: Dr. Rebecca Brooks.

The Emergency Medical Services system is an institution that is a vital part of society. From the humble beginnings of the horse-drawn ambulance carriage in the late 1800’s, to the modern EMS system of today, emergency medicine is and has been an important part of patient care in the pre-hospital setting. Although many attempts were made to classify EMS using sociological principles and theory in the late 1970’s as well as the early 1990’s, recent work in the changing societal climate ceases to exist. Today, one of the best ways to view the EMS system is through the use of symbolic interactionism, mainly in the work of Herbert Blumer and in Charles Horton Cooley’s ideas on primary groups. The lights, sirens, ambulance, and Emergency Medical Technicians can be seen as symbols that facilitate human interaction and communication, both from the perspective of being an “insider” to EMS and an “outsider.”

Multi-Exponential Analysis of Labile Europium Complexes in Polymers. Lukas Kromer, Carey, OH.
Research Advisor & ONU Sponsor: Dr. Jeffrey Gray.

Luminescence of europium complexes is useful as a temperature sensor, but calibration problems require more detailed structural information. Our lifetime analysis has shown that temperature-dependent single-exponential decay rates of europium – diketonate complexes are indeed multi-exponential in thin film samples. We propose a new model of dissociation that represents the multiple lifetimes correlating to different bound states of labile ligands to the europium center. Laser fluorescence of Eu(tta3)Z, a bisoxazoline derivative attached to europium trithenoyltrifluoroacetonato, shows three distinct decay rates. Fluorescence yields varied inversely with temperature and are reversible. Ligand coordination spectroscopy may lead to a better optical temperature sensor with fewer calibration problems through optimization of ligands and polymer substrate.

Perturbations in the Aerospace Sequence of Attitude Determination Using Quaternions. Kevin Earnest, Rensselaer, IN.
Research Advisor & ONU Sponsor: Dr. William Fuller.

This paper investigates ways to represent rotations, the ring of quaternions, the problem of attitude determination of high velocity aerospace devices leading to the aerospace sequence of rotations, perturbations of this aerospace sequence, and the causes of these perturbations.

Predicting Property Offenders. Stephen F. Halas, Canton, OH.
Research Advisor & ONU Sponsor: Dr. Harry Wilson.

With the many new innovations in the world of Crime Mapping, researchers and law enforcement agencies are able to predict the location of a property offender and any route he or she may take to and from the intended target. I will research various methods and use similar one to apply to property crimes in Battle Creek, MI.

Preparation of Chiral 1,5-diazoxyoclooctanes: Application as Chiral Ligands and Catalysts in Asymmetric Organic Synthesis. Derek J. Rhoades, Bellefontaine, OH.
Research Advisor & ONU Sponsor: Dr. Jake Zimmerman.

One of the most widely studied areas in synthetic organic chemistry is the development of new methods for preparing chiral molecules in an optically pure form. The use of chiral ligands and organocatalysts are some of the most powerful methods for achieving high enantiomeric selectivities in organic transformations. This poster presents the design of a new, versatile class of chiral diamine compounds that may be utilized as chiral ligands, organocatalysts, nucleophilic and phase transfer catalysts for a variety of asymmetric organic transformations. This new class of organocatalysts will help alleviate the problem of difficult catalyst structure modifications for application in several asymmetric organic transformations. Their unique design will also allow for crucial hydrogen-bonding interactions needed for transition state stabilization and/or activation of unreactive substrates. Initial results for the application of these catalysts in synthesis will be presented.

Procter and Gamble Expansion. Kathryn Holden. Dublin, OH.
Research Advisor & ONU Sponsor: Dr. Susan Schertzer.

Due to the shift in consumer buying habits in North America and Western Europe, Procter and Gamble’s 2009 sales figures dropped significantly. Moreover, sales figures are predicted to remain low in such areas through 2013 (Euromonitor International, 2010), as many consumers have grown to prefer the lower-priced private label brands. In order to bolster sales figures and generate profit, P&G must turn its focus toward emerging markets that offer a greater opportunity for development and growth. Many of P&G’s competitors have already shifted toward emerging markets, including Reckitt Benckiser who increased its research and development budget by 10% in 2009 to fast track its efforts in Brazil (Euromonitor International, 2009). In addition to Brazil, countries such as China, Egypt, India, Indonesia, Mexico, the Philippines, Poland, Russia, South Africa, South Korea, and Turkey are considered emerging markets. To determine the optimal country for P&G to focus its laundry care efforts, I considered the following variables: market size, market share, GDP per capita, GDP per capita growth rate, and population. After careful analysis I recommend P&G centralize expansion efforts in Brazil, China, and India, with emphasis on China and India due to their large population figures.
Public Health Content in U.S. Doctor of Pharmacy Programs: Results from Surveys of Students and Faculty.
Lauren N. Anderson, Monroe, MI.
Research Advisor & ONU Sponsor: Dr. Natalie DiPietro.

Brief periods of ischemia activate signaling pathways in the heart that protect the myocardium from injury induced by a subsequent episode of prolonged ischemia. This phenomenon, called ischemic preconditioning, is stimulated by the release of endogenous agonists that activate G protein coupled receptors. G protein signaling is modulated by accessory proteins called regulator of G protein signaling (RGS) proteins. RGS proteins terminate G protein signaling by catalyzing the hydrolysis of GTP. Our laboratory is using mice that express a RGS insensitive Ga12 (RGSi-Ga12) mutant to investigate the role of RGS proteins in the heart. We have found that mouse hearts expressing this mutation are resistant to ischemic injury even if they are not preexposed to brief periods of ischemia prior to a prolonged ischemic insult. This cardioprotective phenotype is an exciting discovery because it suggests that RGS proteins may provide a novel therapeutic target for protecting the heart from ischemic injury. We are now investigating the intracellular signaling pathways that are responsible for the cardioprotective phenotype.

Response of Colon Cancer Cells to Selenium and Cis-platinum Exposure. Kara L. Amend, Troy, OH.
Research Advisor & ONU Sponsor: Dr. Amy Aulthouse.

Colon cancer is normally refractive to the chemotherapy drug cis-platinum, (Cis- Pt). Selenium (Se) containing glutathione peroxidase has been studied because of its role in reduction of reactive oxygen species which would improve the efficacy of Cis- pt. The influence of Se on the effect of Cis-PT on the HT-29 colon cancer cell line was tested using a three dimensional agarose culture model. This method allowed independent analysis of mitosis and cell viability. Single cells were suspended in low temperature agarose and grown for 1 week. Se at low doses did not affect cell viability or mitosis when compared to vehicle controls. To simulate the in vivo scenario, colonies were allowed to form prior to Cis-Pt exposure. Experiments were conducted to determine the time course of exposure to Se and Cis-Pt. Some cultures were untreated or pretreated with Se (0.33 g/ml) at day 0 followed by or in conjunction with Cis-Pt (3 and 6 g/ml) on day 4. On day 7 cultures were evaluated for cell viability, using trypan blue exclusion, and mitotic activity by counting single cells and colonies alive and dead. Differences between treatment groups were analyzed using ANOVA at 95% confidence level.

Stereoselective Tin-free Radical Fragmentation Reactions: Preparation of 1,4-dicarbonyl Compounds. Elizabeth Buenger, Greenfield, IN.
Research Advisor & ONU Sponsor: Dr. Jake Zimmerman.

Free radical methods give synthetic organic chemists a range of bond construction strategies that are often unavailable through traditional ionic reactions. Over the last three decades, the study of diastereoselective and enantioselective radical reactions has received much attention. Although there have been significant advances in the field of asymmetric radical processes, there are still many shortcomings. For instance, most of the literature reports require high catalyst loading and toxic reagents such as organotin compounds.
Also, many of these stereoselective free radical methods are very limited in substrate scope. This project focuses on some of these deficiencies. Preliminary results of enantioselective and diastereoselective tin-free intermolecular electrophilic radical additions to electron-rich olefins will be presented.

Stress Differentially Affects Memory for Positive and Negative Words, Independent of Its Proximity to the Learning Experience. Brianne Clark, Barnesville, OH. Ashlee Warnecke, Kalida, OH. 
Research Advisor & ONU Sponsor: Dr. Phillip Zoladz.

Stress can enhance, impair, or have no effect on learning and memory, depending on several factors. We have examined how the temporal proximity of stress to a learning experience affects one’s memory for that experience. Seventy-two participants were exposed to stress (cold pressor test) or no stress by placing their dominant hands in a bath of cold (\(\pm 1^\circ C\)) or warm (36±1°C) water, respectively. Cardiovascular measurements, saliva samples, and pain/stress ratings were collected from participants to corroborate stress induction. Either immediately or 30 minutes after water bath exposure, participants read a list of 30 words that varied in emotional valence. Twenty-four hours later, participants completed free recall and recognition tests to assess their memory for these words. The results indicated that participants exposed to the cold pressor test exhibited significantly greater blood pressure and pain/stress ratings than non-stressed participants. In addition, stress, independent of temporal proximity to the learning experience, led to significantly lower recall of negative words and significantly enhanced recognition of positive words. These results lend insight into how stress differentially affects memory for positive and negative information and suggest that the temporal proximity of stress to a learning experience may not largely influence how stress affects memory.

Research Advisor & ONU Sponsor: Dr. Susan Bates.

Metal alkoxides are typical precursors in the sol-gel processing of oxide materials. In recent years, specially designed M(OR)x precursors have been shown to participate in sol-gel chemistry producing both a metal oxide material and a polymerizable organic monomer unit; one precursor complex delivering both the inorganic and the organic components of a composite material. A potential complication with these systems is that many metal alkoxides do not produce processable sols and gels as a result of traditional sol-gel chemistry. Our research targets metal alkoxide precursors composed of two different alkoxide groups with different reactivity, and producing different monomer units. Complexes prepared by reaction of zirconium (IV) propoxide with 2-hydroxyethyl methacrylate and phenethyl alcohol or 3-hydroxypropionitrile will be discussed.

The Departure of Catalan and Its Impact on Contemporary France. Nicole Amadon, Wadsworth, OH.
Research Advisor & ONU Sponsor: Dr. Thomas Finn.

Despite the fact regional and minority languages have contributed to national French identity, they are disappearing from French society as a result of unification under a single official language. Catalan is one of the most widely used regional languages in France; this represents a significant loss since French would not be the same without influence from Catalan, especially in poetry that had been used by troubadours. Younger generations choose instead to learn a global language, such as English, and many who are familiar with a regional language understand but do not speak or write it. Through detailed analysis of political documents and articles on the French education system, my presentation will show why it is important to keep Catalan in France. Whereas the autonomous Catalonia region in Spain is allowed much self-regulation in the use of Catalan, the French Revolution and the modern constitution forbade the use of Catalan and all languages other than French in schools until recently. France has worked toward a national identity under the French language, but has neglected Catalan as an integral part of this identity.

The Effect of Ethnicity and Body Size on Perception of Authority Posed by Police Officers. Hillary Fletcher, Norwalk, OH. Marlina Mackie, Latham, OH.
Research Advisor & ONU Sponsor: Dr. Kristie Payment.

The proposed research intends to study the effects of ethnicity and obesity on perceptions of authority in police officers. A newspaper article featuring a picture of a White, Asian, or Latino male police officer, either obese or normal weight, will be given to participants. The story will be about their background, prior experience and education and how they got to where they are in their career today. The pictures will be manipulated so that there are pictures of the same White male, obese and normal weight, a Latino male, obese and normal weight, and an Asian male, obese and normal weight. There will be 6 different versions of the picture utilized in the same article. A demographic survey will be given at the beginning, and a questionnaire utilizing a 5-point Likert scale will be given after participants read the article and peruse a distracter advertisement, but only reaction to the article will be measured. Afterwards, participants will be debriefed.

The Effect of Humor and Celebrity Endorsement on Attitude toward an Advertisement and Purchase Intent. Delaney Banas, Toledo, OH. Jacki Hillis, Solon, OH. Warren Burless, Alliance, OH.
Research Advisor & ONU Sponsor: Dr. Kristie Payment.

This 2 x 2 between-subjects design investigated the effectiveness of both humor and celebrity endorsement presence in print advertisements. Eighty five undergraduate college students were distributed simulated magazines that contained two articles and two print advertisements. While one print advertisement acted as a distracter, the other was manipulated to represent one of four conditions including no humor, non-celebrity endorsement; no humor, celebrity endorsement; humor, non-celebrity endorsement; and humor, celebrity endorsement. After the participants were given time to view the articles and print advertisements, they answered a questionnaire that contained 7-point scales that measured attitude toward the advertisement and purchase intent. Attitude toward the print advertisement was based on two different scales, one measuring whether the participants found the advertisement likable or dislikable and the other measuring whether the participants found the advertisement interesting or not interesting. The results indicated that there was a significant main effect of celebrity endorsement for attitude toward the print advertisement, yet there was no significant main effect of celebrity endorsement for purchase
addition of prime numbers and the greatest prime factor. We use the greatest prime factor function to explore the properties of a family of magmas based on the addition of prime numbers and the greatest prime factor function. Then, the same function is used to define a family of recurrence relations on prime numbers.

The Geopolitics of Water: Conflict and Instability in Africa and the Middle East. Leeann Marie Sullivan, Bainbridge, OH. Research Advisor & ONU Sponsor: Dr. David Smith.

Because of the uneven distribution of usable water on the earth’s surface, there is often geopolitical tension among states that share a water basin. This can exist in the form of political unrest as one state pulls water from an upstream region that is reserved for states downstream, or it can exist in the form of social instability as water is a key ingredient in survival, nutrition, and development. This paper uses the Okavango River Basin, Ethiopia, and Jordan and the Jordan River Basin as examples in which water scarcity negatively impacted social stability or political relationships. Through a general overview of water and its impact on social instability and conflict throughout the world, as well as these in-depth examples, I will illustrate why something so basic as water can be the main source of political upset between states. I will also attempt to better understand water’s role in social stability. I will close by making recommendations that call on International bodies and local level initiatives to make water a more stable resource, which will increase the standard of living and ensure that future conflicts over water do not erupt into war. [Paper abstract.]


We use the greatest prime factor function to explore the properties of the set of prime numbers. The concept of prime numbers deals primarily with multiplicative properties of integers; by considering also the additive properties of prime numbers, a rich mathematical structure emerges. We first investigate the properties of a family of magmas based on the addition of prime numbers and the greatest prime factor function. Then, the same function is used to define a family of recurrence relations on prime numbers.
vote efforts such as the Rock the Vote campaign, although popular among young adults, have not significantly increased the turnout of today’s young adults. Although previously seen as the wave of the future, the Internet and social networking tools such as Facebook have also not lived up to their reputation. The ineffectiveness of such efforts is evidenced by the fact that since the 2000 election cycle the percentage of young adults who voted has increased only marginally. By ascertaining the reasoning for the deficiencies in political participation among young adults, there is the potential to stimulate an increase in voting among the age group.

Whole Foods Expansion. Jacob J. Hoyt, Dublin, OH. Research Advisor & ONU Sponsor: Dr. Susan Schertzzer.

Whole Foods Market is the world's top natural and organic foods chain. It established the supermarket concept in natural and organic foods retailing. Whole Foods has 280 locations inside the United States, which is significantly less stores than their main indirect competitor, The Kroger Company. Whole Foods Market is the leading organic and natural food provider in the United States and with locations in only 38 states they are losing sales to their indirect competitors all across the United States. In this research we examined two questions related to expansion: First does the location have a high population? Second does the location have a large number of their target market; Whole Foods target market is defined as college educated residents, because those communities are generally more interested in the benefits of eating natural and organic foods. As a result of this Geographic Information System (GIS) analysis of demographics, I suggest that Whole Foods Market open three new stores in Boise, Idaho; Pittsburgh, Pennsylvania; and San Antonio, Texas. Each one of these locations has sufficient population to sustain a Whole Foods Market and have a large number of young educated people which is one of Whole Foods target market.
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Campus Buildings:
1 Alumni House
2 Biggs Engineering Building
3 Burgett Pavilion
4 Business Services Building
5 Child Development Center
6 Commons Building
7 Counseling Center
8 Courtyard Apartments
9 Dial-Roberson Stadium
10 The Dicke House-President's Home
11 Dukes Memorial
12 Elzay Gallery of Art
13 English Chapel
14 Freed Center for the Performing Arts
15 The Hakes-Pierstorf Family Pharmacy Education Center
16 Heterick Memorial
17 Hill Memorial
18 The Inn at ONU
19 James F. Dicke Hall
20 Lehr Memorial
21 Maintenance Facility
22 Mathile Center for the Natural Sciences
23 McIntosh Center
24 Meyer Hall of Science
25 Multicultural Center
26 Northern on Main
27 Office of Career Services-Lehr Kennedy House
28 ONU Sports Center/King Horn
29 Physical Plant Grounds Dept.
30 Physical Plant Offices
31 Picnic Pavilion - Shelter House
32 Presser Hall
33 Remington Walk
34 Robertson-Evans Pharmacy Building
35 Science Annex
36 Student Health Center
37 Taft Memorial
38 Taggart Law Library
39 Tilton Hall of Law
40 Weber Hall - Admissions/Financial Aid
41 Wilson Art Building
42 WONB Radio Transmitter & Tower

Student Housing:
43 5 University Parkway
44 Affinity Village
45 Brookhart Hall
46 Clark Hall
47 Delta Sigma Phi
48 Founders Hall
49 Klondike's Den
50 Lakeview
51 Lima Hall
52 Maglott Hall
53 Northern Commons
54 Northern House
55 Park Hall
56 Phi Mu Delta
57 Polar Place
58 Roberts Hall
59 Sigma Pi
60 Stadium View Apartments
61 Stambaugh Hall
62 University Terrace

Parking Lots:
A 5UP
B Affinity/Stadium View
C Biggs
D Clark
E Dicke
F Dukes
G Freed
H Hill
I King Horn
J Lakeview
K Lehr
L Lincoln
M Main
N McIntosh (Admissions and Financial Aid Parking)
O Meyer East
P Meyer West
Q Pharmacy
R Polar Bear Way
S Raabe
T Stadium
U Stambaugh
V University Inn
W Wander
X West Circle