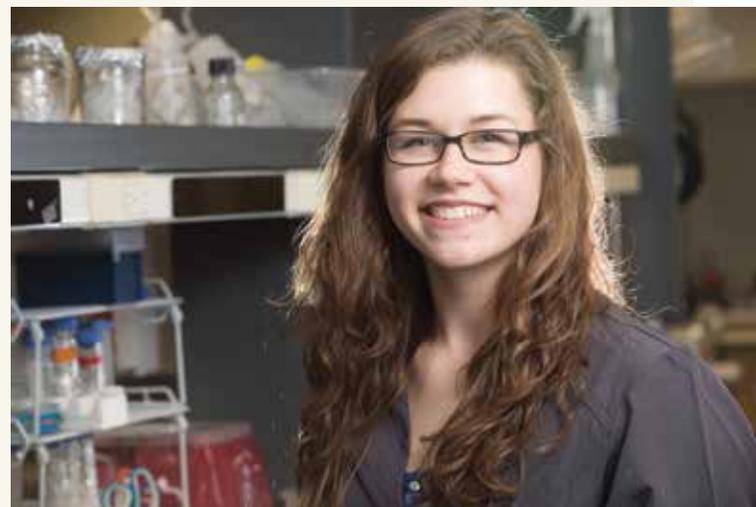




2017 STUDENT RESEARCH COLLOQUIUM

Celebrating student research achievement



2017 ONU STUDENT RESEARCH COLLOQUIUM
Friday, April 28
McIntosh Center



WELCOME TO OHIO NORTHERN UNIVERSITY'S STUDENT RESEARCH COLLOQUIUM!

The Student Research Colloquium is a true showcase for university research, with students from all five colleges scheduled to present 120 projects this year. For those who participate, research bridges the gap between knowledge and experience and provides for career exploration and development. Presenters at this year's Colloquium will share the results of their research with the larger academic community, enliven the intellectual climate on campus, and stimulate discussions and collaborations within and across disciplines, all while developing skills important to their long-term personal and professional success.

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COLLOQUIUM SCHEDULE

All Colloquium activities take place in the McIntosh Center.

Posters

10-11 a.m.
11:10 a.m.-12:10 p.m.
12:20-1:20 p.m.
1:30-2:30 p.m.

Activities Room

Chemistry, Pharmacy and Psychology (Behavioral Neuroscience)
Nursing
HPSS, Biology, Physics, Engineering and Technology
Marketing, Public Health, Criminal Justice, Political Science, Psychology (General) and Musical Theatre

Papers

10-11 a.m.
11:10 a.m.-12:30 p.m.
12:40-1:40 p.m.

Deans' Heritage Room

English 1
English 2 and Theatre
Pharmacy

Papers

10-11:40 a.m.
11:50 a.m.-1:30 p.m.

Room 202

Political Science, PPE and Law
Communication, Sociology and Public Health

Capstones

10-11:30 a.m.
11:30 a.m.-1 p.m.
1-2:30 p.m.

Bear Cave

Honors Pharmacy 1
Honors Pharmacy 2
Honors Pharmacy 3

ACKNOWLEDGMENTS

- ★ Many thanks are extended to all members of the ONU community who have helped to make the 2017 Student Research Colloquium such a success.
- ★ The staff members of the Office of Communications and Marketing and Printing Services, especially Sheila Baumgartner and Joshua Crawford, deserve special mention for producing the materials that promote the Colloquium across campus.
- ★ The staff members of Physical Plant, Catering, and the McIntosh Center, especially David Dellifield, are invaluable in helping with all the behind-the-scenes details that bring our Colloquium to fruition each year.
- ★ Sincere gratitude is offered to Interim Dean Tena Roepke and the Getty College of Arts and Sciences for generous funding of this event.
- ★ The Colloquium could not run as smoothly as it does without the unstinting efforts of members of the Getty College of Arts and Sciences Student Advisory Board and student volunteers from across Ohio Northern University.
- ★ Additional thanks go to all the student presenters and their faculty mentors who ensure that scholarly research and deep learning are vital to an Ohio Northern education.
- ★ Finally, we thank all friends and family of and visitors to the Northern community and welcome your presence today.

THE STUDENT RESEARCH COLLOQUIUM PLANNING COMMITTEE

Mary Drzycimski-Finn, Asst. to the Dean - Student Success
Thomas Finn, Professor of French and Spanish
Rebecca Lifer, Chair, A&S Student Advisory Board

Vicki Motz, Assistant Professor of Biological Sciences
Rebecca Phlipot, Asst. Chair, A&S Student Advisory Board
Phillip Zoladz, Associate Professor of Psychology

POSTER PRESENTATIONS

Activities Room

Chemistry, Pharmacy and Psychology (Behavioral Neuroscience)

10-11 a.m.

1. "FKBP5 Polymorphisms Influence Pre-Learning Stress-Induced Alterations of Learning and Memory"
Brienne Mosley, Tessa Duffy, Kelsey Hess, Mackenzie R. Riggenbach, Leighton Wireman, Jennifer Hipskind, Julie Handel, Moriah Roseler
2. "ADRA2B Deletion Variant Influences Time-Dependent Effects of Pre-Learning Stress on Long-Term Memory"
Tessa Duffy, Brienne Mosley, Kelsey Hess, Mackenzie R. Riggenbach, Leighton Wireman, Jennifer Hipskind, Julie Handel, Moriah Roseler
3. "Fluoxetine Does Not Prevent Increased Voluntary Ethanol Consumption in a Predator-Based Psychosocial Stress Model of PTSD"
Robert Rose, Brooke Kohls, Megan Heikkila, Brooke J. Hertenstein, Kiera Robinson, Kasey Mucher, Madelaine Huntley, Paul D'Alessio
4. "Propranolol Is Ineffective at Blocking the Cardiovascular Consequences of a Predator-Based Psychosocial Stress Model of PTSD"
Brooke Kohls, Robert Rose, Thorne Stoops, Megan Heikkila, Brooke J. Hertenstein, Kiera Robinson, Kasey Mucher, Madelaine Huntley, Paul D'Alessio
5. "Role of Regulator of G-Protein Signaling 5 in Modulating Blood Pressure, Cerebral Vascular Oxidative Stress and Emotional Behaviors"
Trevor C. Guisinger, Haval Norman
6. "History of Prenatal Methamphetamine Exposure Increases Vulnerability to Nicotine Addiction in Adult Male Rats but not Female Rats"
Mary K. Evans, Christina Marengo
7. "Differential Effects of Kappa Opioid Receptors in the Nucleus Accumbens and Ventral Tegmental Area on the Aversive Effects of Nicotine"
Melissa A. Ward, Saleh Alqifari
8. "Kappa Opioid Receptors and Aversive Effects of Nicotine"
Melissa A. Ward, Haval Norman
9. "Prenatal Methamphetamine Exposure Increases Blood Pressure and Impairs Endothelial Function in Adult Male Offspring"
Allie M. Harrison
10. "Role of Regulators of G-Protein Signaling RGS2 and RGS4 Proteins in Nicotine-Induced Anxiolytic Behaviors"
Lisanne Sprague, Uhood Ashkan
11. "Impact of Methamphetamine on the Ischemic Heart in Adult Rats"
Sarah Hebble, Thorne Stoops
12. "Novel Efficacious Treatment of Melanoma with an Over-the-Counter Drug Agent"
Steven D. Blake, Christopher M. Tweed, Shelby G. McKamey
13. "Code Cart Medication Trays: Novel Resource and Design Implementation - Phase 2"
Isabel E. Cwikla
14. "Analysis of the Impact of Education on Understanding Over-the-Counter Medication Labels in Children Ages 9-12"
Mary Palmer, Emma Schutt
15. "Amino Acid-Based Amine Bis(phenolate) Ligands for Metal Complexes and Lactide Polymerization"
Grant M. Allbritten, Kristina Myers
16. "Synthesis of Ligands Bearing Amino Acid Groups via the Mannich Reaction"
Cheyanne M. Laux, Amanda K. Swanson
17. "Efficient Synthesis and Characterization of Thioether Appended α -imino Pyridines and Corresponding Cu^{2+} Metal Complexes"
Michael James Murray
18. "Synthesis and Catalytic Assessment of Palladium Complexes Bearing Bridging and Pendant Amine Bis(phenolate) Ligands"
Eric M. Collins, Brendan J. Graziano, Nathan C. McCutcheon, Nicole M. Braunscheidel
19. "Lead (II) Detection Utilizing Highly Fluorescent Sulfonamido-Chromone Derivatives"
Megan Renee Nieszala, Jonathan Gregory Szczerba
20. "Glyphosate-Induced Phosphate Desorption in the Maumee River Watershed"
Sofie Elisabeth M. Moeller, Emily Richards
21. "Effect of pH on Soluble Phosphate in Soils"
Anne Marie McElwee

Nursing

11:10 a.m.-12:10 p.m.

1. "Delirium vs. Dementia: Determining the Difference to Improve Patient Outcomes"
Jessica L. Plaughter
2. "Evaluating Nursing Knowledge of Pain Assessment in Mechanically Ventilated Adults"
Jessica Niese
3. "Nurse Perception of Patient's Understanding of Medications and Educational Tools Used"
Joanna E. Messerly
4. "Evaluation of Nursing Adherence to Isolation Precautions"
Brooke N. Kennedy
5. "Analyzing Feeding Readiness Scale with Float Staff to Improve Patient Outcomes"
Kirsten N. H. Burden
6. "Safe Patient Handling and Proper Use of Safe Patient Transferring Equipment"
Collin G. Bzovi
7. "Decreasing Surgical Site Infection Rates on Medical Surgical and Intensive Care Units"
Amy Nicole Bauman
8. "Early Ambulation after Open Heart Surgery: Policy vs. Practice"
Tyler Mason Turner
9. "Simulation as an Effective Training Method for Nurses"
Jillian L. Chapman
10. "Prevention of Central-Line Associated Bloodstream Infections through Mandatory Aseptic Protocol"
Allison Riley Gast
11. "Tracheostomy Suctioning Education for Nurses in an Acute Care Setting"
Michaela Gutierrez
12. "Implementing Quiet Time in the Intensive Care Unit"
Abbie Nicole Patton
13. "Fall Prevention Strategies Related to Orthostatic Hypotension"
Taylor McCabe
14. "Fever Management Practices in the Intensive Care Unit Setting"
Alexandria Thacker
15. "Discharge Satisfaction: Reasons for Delays and Ways to Improve Patient Satisfaction"
Suzanne C. Young
16. "Encouraging Mastisol Use to Prevent Central Line Associated Bloodstream Infections (CLABSI)"
Mitchell James Stierwalt
17. "Benefits and Barriers to Hourly Rounding"
Nichole Reynolds
18. "Pain Management: Zero Pain is Not the Goal"
Shelby R. Goldsmith
19. "Nurses' Perceptions on Effective Pediatric Patient and Family Education"
Hailee Robson
20. "Broselow Cart Implementation and its Effect on Staff Satisfaction in Pediatric Traumas"
Kaitlyn E. Schellhouse

21. "Recognizing and Preventing Burnout in Float Pool Nursing"
Hannah L. Milstead
22. "Perspectives of ICU Nurses on e-ICU Technology"
Amber R. Paul
23. "Nurses' Perceptions of the Open Visitation Policy in an Intensive Care Unit"
Cara Elizabeth Walden

HPSS, Biology, Physics, Engineering and Technology

12:20-1:20 p.m.

1. "Male Collegiate Athletes' Reaction Time Associated with Repeated Assessment of a Yardstick Test"
Santana Matthew Villarreal, Rob Ray Cremeans
2. "The Role of Sleep Duration on Athletic Performance in Collegiate Endurance Track Athletes"
Chelsea Legge, Stephanie Brookens
3. "Comparison of at-Home Strengthening and Balance Exercises Using BESS Test"
Aaron M. Smith, Steven G. Feucht
4. "The Accuracy and Validity of iOS-Based Heart Rate Apps during Moderate to High Intensity Exercise"
Alexa M. Bouts, Lauren A. Brackman, Elizabeth J. Martin, Adam M. Subasic
5. "Comparison of FEV1/FVC Ratio between Athletes and Vocal Musicians"
Maggie Goeller, Ashley Grisnik, Taylor L. Hoffman
6. "The Effect of Music as a Driving Distraction as Measured by Reaction Time"
Keely L. Wagner, Addie M. Davis, Sara D. Landis, Habib I. Mohammad
7. "The Effects of Tea and Essential Oil Forms of Cymbopogon citratus on Alpha and Beta Brain Wave Activity"
Samson Maxwell Frendo, Brooke J. Hertenstein, Ashley M. Mast, Malachi S. Nolletti
8. "Diet Implications of Civet Cats (Subfamily Paradoxurinae) from Low Magnification Dental Microwear Examinations."
Sophia Mae Beery
9. "Refining the Gas Kinematics in NGC 4552 for Black Hole Mass Determination"
Shota Hodono
10. "ATMAE Robot"
Dakota S. Miller, Timothy J. Van Sickle, Brady Michael Schulte, Randy Baughman
11. "Manufacturing Robotic Work Cell"
Scott T. Rapps, Nathan C. Kaszei, Leslie B. Somsak, Akira Aiba, Jacob W. Lochard
12. "Energy Audit for Taft Memorial and Sustainability Efforts"
Eric Daulton Radford, Brady Michael Schulte
13. "Performance Characteristics of Variable Activation Function Neural Networks"
Derek Michael Smith
14. "Building a Better Digital Identity"
Ryan M. Strawser
15. "NS3 Network Simulation to Validate a Periodic Discrete-Time Localization Algorithm in Vehicular Networks"
Edgar E. Gomez
16. "Improving the Accuracy of GPS Localization by Using V2V and V2I Communication"
Kylee Marie Tressler
17. "Quantum Control"
Bryan P. Peck
18. "Investigation of Whole-Limb Motion as a Primary Motor Goal during Gait"
John D. Rasch, Amanda Rhoad

19. "Building a Robotic Football Quarterback"
Josh Gedert, Jordan Reeves, Aaron Johnson, Dillon Brancheau, Nathan McCown

Marketing, Public Health, Criminal Justice, Political Science, Psychology (General) and Musical Theatre

1:30-2:30 p.m.

1. "Household Food Insecurity and Nutrition: An Analysis of Rural Western Ohio Communities"
Rachel L. Doty
2. "An Examination of Local Newspaper Coverage of the Heroin Epidemic in Ohio in the Fall of 2016"
Courtney L. Walland, Jena M. Wensole, Stephanie N. Acton
3. "Music Composition for *Lysistrata*"
Stephen Cookley
5. "Working Hard to Remember: Academic Habits and Working Memory"
Sara Lininger, Danyel Heilman, Caitlin C. Nahirniak, Clara Huffman
6. "Talking It Out: Investigating the Relationship between Verbal Ability and Externalizing Behaviors among College Students"
Taylor Lynn Wohlgamuth, Kayla Reuss, Ryan Holtzman, Courtney Tinkey
7. "A Cell Phone's Vibration and Ringer Effects on Students' Encoding and Retrieval"
Bethany Grace Meek, Leanna Nicole Henry, Melanie Marie Vaughn
8. "The Impact of Writing Style and Time of Testing on Memory"
Mackenzie R. Riggenbach, Ilaria M. DiBernardo, Caitlin C. Nahirniak
9. "The Venezuelan Prison System"
Derek K. Price
10. "The Philippines' Prison Systems"
Derek K. Price
11. "Rock and Roll and College Campuses in the '70s"
Travis Michael Yammine
12. "Apps for Business Students: The Utility of Google Apps for Business Curriculum"
Daniel Hadidon
13. "A New Meijer for Grand Rapids?"
Casey Bozarth
14. "Bringing a Dog Park to Ada, OH"
Courtney M. Hendershot
15. "Chick-Fil-A at ONU"
Emily A. Pfoff
16. "Entertainment Park in Ada"
Jordan R. Bostater
17. "Bringing Target to Lima, OH"
Michael Chen
18. "A Sports Equipment Store in Ada, OH"
Matthew Mangan
19. "Bringing Kroger to Cuyahoga County"
Megan Thomas
20. "Steak 'n Shake in Ada"
Tyson E. Bolenbaugh
21. "Wealth and Auto Sales, A Geospatial Analysis"
Zachary P. Zimmerman
22. "Assessing Segmentation Data, A Case Study"
Madison M. Ross
23. "An Outdoor Gym for Ft. Lauderdale: A Case"
Matthew Deter

PAPER PRESENTATIONS

English 1 10-11 a.m. Dr. Jennifer Moore, Moderator Deans' Heritage Room

1. "The Flower Doesn't Dream of The Bee"
Rachel L. Cruea
2. "The Art of Losing"
Kelley A. Lewis
3. "One Giant Leap: The Moon as Lyric Poetry"
Kasy Jo Long

Political Science, PPE and Law 10-11:40 a.m. Dr. Mark Dixon, Moderator Room 202

1. "*Legally Blonde* or Legal Bluff: An Investigation of Gender Equality within the Legal Profession"
Margaret Elizabeth Kimmel
2. "The Evolution of the Florida Democratic Party: From Conservative to Liberal"
Daniel R. Warren
3. "Correlation Between the Immorality of Slavery in the United States and Economic Benefits"
Alex Paul Yakos Brown
4. "Russia's Annexation of Crimea"
Makiko Kabesu
5. "Improving Rule of Law in Kosovo through Judicial Reforms on Accountability during the Appointment and Reappointment Process of Judges"
Fitore Sadiku

English 2 and Theatre 11:10 a.m.-12:30 p.m. Dr. Joan Robbins, Moderator Deans' Heritage Room

1. "Selections from 'Halls of Freya'"
Sofie Elisabeth M. Moeller
2. "The Mic Over There"
Nicholas Pesetsky
3. "Titus, Everybody, Let's Give Him a Hand"
Kathryn Claire Kuchefski
4. "Dramaturgy for the International Play Festival"
Erica Gabel

Communication, Sociology and Public Health 11:50 a.m.-1:30 p.m. Dr. Robert Carrothers, Moderator Room 202

1. "Ready or Not: Evaluating Disaster Preparedness Systems at Ohio Northern University from a Public Health Perspective"
Michaela Renee Walker
2. "Campus Commuter Programs"
Mackenzie Nichole Zembower
3. "Civil Implications of Three-Dimensional Bioprinting"
Holly R. Dyer
4. "The Miraculous Power in Animation: A Look at Power and Gender Roles in Animation"
Danyel Heilman
5. "A Look at the School-to-Prison Pipeline: Education or Incarceration"
Penny A. Gibson

Pharmacy 12:40-1:40 p.m. Dr. Brittany Bates, Moderator Deans' Heritage Room

1. "Small Molecule Affinities for Sirt-1 Deacetylase Enzyme"
Martin Brenneman
2. "A Failure Mode Effect Analysis of the Use, Risks, and Costs of Insulin Pens vs. Vials in a Community Hospital Setting"
Emily Wells, Brooke N. Taylor, Samantha M. Hopton
3. "Pharmacist and Student Pharmacist Perspectives on Providing Preconception Care"
Rana Najjar

HONORS CAPSTONE PRESENTATIONS

Dr. Patrick Croskery, Moderator
Bear Cave

Honors Pharmacy 1 10-11:30 a.m.

1. "The Effects of Disintegrants on the Dissolution Characteristics of Ibuprofen Containing Tablets"
Caleb A. VonStein
2. "A Cuban Experience: Insight on the Medical System and Recent Developments"
Kara Sosinski
3. "Results of a Pharmacy Student-Led Admission Medication Reconciliation Program in Selected High-Risk Patients"
Jana Louise Randolph
4. "Evaluation of Multiple Methods of Detecting Beta-Lactam-Induced Vancomycin Resistance in *Staphylococcus aureus*"
Sarah E. Bova, Angela J. Rademacher
5. "Evaluation of School Selection Process of Current Pharmacy Students"
So-Hee Choi

Honors Pharmacy 2 11:30 a.m.-1 p.m.

1. "Evaluation of a New ASCP Outreach Initiative: Falls Prevention for Seniors"
Cassandra L. Hacker
2. "Role of Regulators of G-protein Signaling RGS2 and RGS4 Proteins in Nicotine-Induced Behaviors"
Haval Norman, Lisanne Sprague
3. "Patient Demographic Influences on Ohio Medicare Beneficiary Influenza Vaccination Rates"
Sean Bennett
4. "Assessing Current Knowledge of Practices in Acute Perioperative Pain Management"
Sarah Miller
5. "Santa for Seniors: Professional Development during a Pharmacy Student Outreach"
Isabel E. Cwikla

Honors Pharmacy 3 1-2:30 p.m.

1. "RGS2 and Its Role in Modulating Angiotensin-II-Induced Hypertension, Reactive Oxidative Stress Levels, and Emotional Behaviors"
Bruce Xu
2. "Drug Utilization Review of Reversal Agents Used to Treat Patients Experiencing an Intracranial Hemorrhage on NOACs"
Olivia Henton
3. "Advancement of ONU's College of Pharmacy Outreach Program"
Abigail Anna Barlage
4. "Assessment of ONU Research Participant Consent Forms"
Kaitlin Bova
5. "Design Development of an Over-the-Counter Medication Mobile Application to Promote Safe, Reliable, and Effective Self-Care"
John Mostowy

COLLOQUIUM ABSTRACTS

Alphabetically by Title

“A Cell Phone’s Vibration and Ringer Effects on Students’ Encoding and Retrieval”

Poster 7, 1:30-2:30 p.m., Activities Room

Presenters: Bethany Grace Meek (Akron, OH); Leanna Nicole Henry (West Jefferson, OH); Melanie Marie Vaughn (McGuffery, OH)
Research Advisor: Kristie Payment (Psychology, ONU)

Although cell phones have many positive implications, they can be detrimental to performance on cognitive tasks. The current study manipulated not only the type of cell phone setting (vibrate, ring, and no sound), but also the time the distraction took place (encoding or retrieval). In order to see the impact of these variables, participants were measured on the number of questions answered correctly on a comprehension test. Using a 3 X 2 between subjects study, 78 undergraduate participants (Mage = 19.5, male = 35, female = 43) were randomly assigned to one of five conditions. Participants read and answered questions from a GRE practice reading comprehension test. Depending on which condition participants were in, a phone distractor would occur at a certain time. No significant differences of the type of phone distractor or time of distraction were found ($p > .05$).

“A Cuban Experience: Insight on the Medical System and Recent Developments”

HONR 2, 10-11:30 a.m., Bear Cave

Presenter: Kara Sosinski (Hudson, OH)

Research Advisor: Ben Aronson (Social & Administrative Pharmacy, ONU)

This presentation will address the current Cuban healthcare system, recent monumental medical advancements specific to the isolated nation, and what to expect in regard to the relationship developing between the United States and Cuba. This presentation will be synthesized using first-hand experience acquired from studying abroad, as well as research conducted specific to the three topics underlying the focus of the presentation. The goal of this presentation is to educate medical students and professionals on a nation that has been sheltered from the United States for an extended period of time. With our emerging relationship, it will be essential that our country recognizes what Cuba has to offer and how Cuba functions.

“A Failure Mode Effect Analysis of the Use, Risks, and Costs of Insulin Pens vs. Vials in a Community Hospital Setting”

Paper 2, 12:40-1:40 p.m., Deans’ Heritage Room

Presenters: Emily Wells (New Carlisle, OH); Brooke N. Taylor (Indianapolis, IN); Samantha M. Hopton (Wickliffe, OH)

Research Advisors: Mary Ellen Hethcox (Pharmacy, ONU); Brittany Bates (Pharmacy Practice, ONU)

The use of insulin pens was adopted by many institutions as a way to reduce needle sticks and dosing errors which occurred with the use of vials. Lima Memorial Hospital adopted the pen form for meal-time insulin use in June of 2008. Based on recent survey results from the nursing staff, concern was raised about nurses using the same pen among multiple patients. Additionally, considerable waste was noted in the pharmacy. It was determined that a full review of the process of insulin use should be conducted and a failure mode effect analysis (FMEA) was proposed. Members of the nursing and pharmacy staff, as well as the process improvement team, will map the current practice for prescribing, transcribing, dispensing, administering, and monitoring of Novolog, Lantus and Levemir insulin pens. This process mapping, along with a fishbone analysis, will help to identify holes in the process to indicate where improvements can be made. Once the procedure is mapped, possible errors will be pinpointed and members will determine which errors could produce the most harm. Based on best practices from literature and input from the staff, failsafe procedures designed to minimize the risk of harm will be developed,

implemented, and subsequently measured for improvement or failure. The new procedures will be reevaluated in thirty, sixty, and ninety days to assess its success, along with regular biannual and annual reassessments.

“A Look at the School-to-Prison Pipeline: Education or Incarceration”

Paper 5, 11:50 a.m.-1:30 p.m., Room 202

Presenter: Penny A. Gibson (Kenton, OH)

Research Advisor: Robert Carrothers (Sociology, ONU)

As a reaction to school crime and violence, educators have made various attempts to make schools safer. One of the measures taken was the development of zero-tolerance policies. These policies have unfortunately created a new set of problems and raise some serious questions about social class and race issues. This is especially true in urban schools where these sanctions are typically applied to poor and minority students. An analysis of the zero tolerance policy and the school-to-prison pipeline reveals some interesting patterns; a disproportionate number of minority and low socioeconomic students are represented among those who fail to graduate from high school and end up the judicial system. These new patterns are evolving out of changes in our society. Therefore, it is important that social scientists study this new trend. Populations are being marginalized and basically discarded. By looking at various sociological theories, we can begin to understand why this is taking place and what we need to do to make the necessary changes.

“A New Meijer for Grand Rapids?”

Poster 13, 1:30-2:30 p.m., Activities Room

Presenter: Casey Bozarth (Leslie, MI)

Research Advisor: Harry J. Wilson (Management & Geography, ONU)

The purpose of this research was to assess the worth of a new Meijer department store built in Grand Rapids, Michigan. Meijer is a large department store that sells groceries, clothing, pharmaceuticals, and many other products. It is a popular shopping destination and a common alternative to similar stores such as Walmart and Target. Meijer is a regional chain, and its stores are situated only in the Midwest. For analysis, we used Esri Business Analyst Online software and utilized consumer and demographic data pertinent in these types of studies. Variables include income, amount of trips to the grocery store, and other shopping habits. We also looked at other competitors in the area and where other Meijers are already located in comparison to the new proposed location. We also conduct drive time analysis with respect to our new proposed location, a method that helps illuminate the target market for nearby residents. We produced a number of choropleth maps, charts and tables that summarize our findings. After analyzing the data found, we conclude that a small Meijer located in downtown Grand Rapids would be very successful and beneficial to the people living there.

“A Sports Equipment Store in Ada, OH”

Poster 18, 1:30-2:30 p.m., Activities Room

Presenter: Matthew Mangen (Versailles, OH)

Research Advisor: Harry J. Wilson (Management & Geography, ONU)

The purpose of my study is to show the potential market for a new sporting goods store in Ada, Ohio. I looked at several different factors that go into making a store successful. Specifically, I looked at consumer incomes and amount of money being spent on sporting goods items. Lastly, I looked at the seasonality of the sports and how it would affect the income flow of sales. I used ESRI Business Analyst GIS software for analysis and to develop summary maps, charts and tables. Consumer analysis showed that Ohio Northern University and Ada schools are two markets that provide a large customer base for the company, supplemented by hunting enthusiasts who live nearby. I conclude that a new sporting goods store would prosper in Ada.

“ADRA2B Deletion Variant Influences Time-Dependent Effects of Pre-Learning Stress on Long-Term Memory”

Poster 2, 10-11 a.m., Activities Room

Presenters: Tessa Duffy (Wilmington, OH); Brianne Mosley (Bremen, OH); Kelsey Hess (Danville, PA); Mackenzie R. Riggenbach (Convoy, OH); Leighton Wireman (Elida, OH); Jennifer Hipskind (Ada, OH); Julie Handel (Rochester, NY); Moriah Roseler (Ada, OH)
Research Advisor: Phillip Zoladz (Psychology, ONU)

Extensive work over the past few decades has shown that certain genetic variations interact with life events to confer increased susceptibility for the development of psychological disorders. The deletion variant of the ADRA2B gene, which has been associated with enhanced emotional memory and heightened amygdala responses to emotional stimuli, might confer increased susceptibility for the development of post-traumatic stress disorder (PTSD) or related phenotypes by increasing the likelihood of traumatic memory formation. Thus, we examined whether this genetic variant would predict stress effects on learning and memory in a non-clinical sample. Two hundred and thirty-five individuals were exposed to the socially evaluated cold pressor test or a control condition immediately or 30 min prior to learning a list of words that varied in emotional valence and arousal level. Participants' memory for the words was tested immediately (recall) and 24 h after learning (recall and recognition), and saliva samples were collected to genotype participants for the ADRA2B deletion variant. Results showed that stress administered immediately before learning selectively enhanced long-term recall in deletion carriers. Stress administered 30 min before learning impaired recognition memory in male deletion carriers, while enhancing recognition memory in female deletion carriers. These findings provide additional evidence to support the idea that ADRA2B deletion variant carriers retain a sensitized stress response system, which results in amplified effects of stress on learning and memory. The accumulating evidence regarding this genetic variant implicates it as a susceptibility factor for traumatic memory formation and PTSD-related phenotypes.

“Advancement of ONU's College of Pharmacy Outreach Program”

HONR 3, 1-2:30 p.m., Bear Cave

Presenter: Abigail Anna Barlage (Versailles, OH)
Research Advisor: Michelle Musser (Pharmacy Practice, ONU)

As a requirement for the Doctor of Pharmacy program, students complete 40 hours of service learning through direct patient interaction. Students are able to self-select the events they participate in. Events must meet the objectives set forth by the Director of Outreach. Many of these hours are completed through events hosted by the various pharmacy organizations on campus. Working with Dr. Michelle Musser, our goal is to identify which outreach events are most impactful to the students in helping them prepare to be confident and knowledgeable health care providers. The assessment will be completed through surveys to P3 and P5 students to determine perceptions regarding outreach such as what students hope to accomplish, which skills students hope to obtain or improve, as well as asking post outreach which event was most impactful and why. It is expected that the most impactful events will be those with hands-on, direct patient screening and counseling compared to educational poster based events. With this information, we will work with the various organizations on campus to create events allowing for the greatest amount of impact to student development and improve the outreach events hosted by ONU.

“Amino Acid-Based Amine Bis(phenolate) Ligands for Metal Complexes and Lactide Polymerization”

Poster 17, 10-11 a.m., Activities Room

Presenters: Grant M. Allbritten (Warsaw, IN); Kristina Myers (Orient, OH)
Research Advisor: Amelia Anderson-Wile (Chemistry, ONU)

Over the past decade, interest has grown in the development of organometallic complexes for the polymerization of monomers from renewable resources. Our research targets the polymerization of

lactide, which may be obtained from glucose to Polylactide (PLA) using titanium and other metal catalyst precursors bearing variations of the amine (bisphenolate) ligands. The [OONO] ligands have been synthesized using a Mannich reaction between formaldehyde, 2,4-dimethylphenols/2,4-ditertbutylphenols, and amino acids. Optimum conditions have been established when synthesizing the desired [OONO] ligands using (D,L) alanine or glycine, yielding distinct and characterized amine (bisphenolate) ligands. When the di-methyl bisphenolate ligand recrystallized with acidic methanol, the ligand esterified and the methyl ester was formed. A complete crystal structure of this ligand was analyzed and reported. Complexation to a metal center through the use of titanium isopropoxide as the metal precursor and the methyl ester amine (bisphenolate) ligand provided an array of octahedral complex possibilities. Work investigating the polymerization of lactide by this titanium metal complex is currently underway. With optimal conditions determined for complexation reactions, titanium and other metal catalysts will be used to further polymerize lactide to PLA.

“An Examination of Local Newspaper Coverage of the Heroin Epidemic in Ohio in the Fall of 2016”

Poster 2, 1:30-2:30 p.m., Activities Room

Presenters: Courtney L. Walland (Independence, OH); Jena M. Wensole (Lima, OH); Stephanie N. Acton (Dola, OH)
Research Advisor: Joseph DeLeeuw (Criminal Justice, ONU)

Heroin has become a critical problem in Ohio. In recent months, the growing number of heroin related arrests and overdoses has been labeled as an epidemic. The goal of this project is to develop a better understanding of how Ohio's battle against the heroin epidemic is reflected in the media, specifically in the online coverage of two Ohio-based newspapers. This study examines heroin-related articles posted on the websites of Toledo Blade and Dayton Daily News from August to December 2016. Articles posted during this period were coded for content and reader interaction. The results of this study will contribute to the existing literature on the media's coverage of drug use and crime as well as the growing heroin problem in the United States. This project will also create a foundation for future research on how multiple forms of media present the heroin problem in Ohio and surrounding states.

“An Outdoor Gym for Ft. Lauderdale: A Case”

Poster 23, 1:30-2:30 p.m., Activities Room

Presenter: Matthew Deter (Bluffton, OH)
Research Advisor: Harry J. Wilson (Management & Geography, ONU)

The purpose of this study was to assess the viability of a new outdoor gym at a specific location in Fort Lauderdale, Florida. Fort Lauderdale was chosen because of its proximity to the beach, its high number of tourist-related industries, its growing youthful population, and its relatively low number of gyms in the area. The burgeoning demographic of single 20s age group is an especially important factor as research suggests that most customers of gyms of this type fall into this class. GIS software vendor ESRI provides the means for exploring these and other important variables pertaining to consumer trends and local demographics. Spatial analysis reveal clusters of potential customers living near the growing community, and strongly suggest the viability of a gym at a specific location in Fort Lauderdale.

“Analysis of the Impact of Education on Understanding Over-the-Counter Medication Labels in Children Ages 9-12”

Poster 14, 10-11 a.m., Activities Room

Presenters: Mary Palmer (Maineville, OH); Emma Schutt (Kings Mills, OH)
Research Advisor: Erin Petersen (Pharmacy Practice, ONU)

Background: As early as age 11, children begin self-medicating.¹ In 2012, poison control centers managed over 296,000 cases involving children with half involving medication misuse.² The goal of this study was to determine if a short educational intervention improved students understanding of proper Over the Counter (OTC)

administration. **Methods:** A survey using true/false and free response questions assessed 6th grade students' understanding of information related to OTC medications, dosing, and safety. A pretest/ posttest model with a 30 minute educational intervention was completed to demonstrate changes in student knowledge of OTC medications and safety. Survey data was compared using the SPSS system. **Results:** 66 students completed the activity. Overall, improvement in student performance was noted on all 5 patient scenario questions and 9 of 10 true/false questions. Statistically significant changes were noted for 7 of 15 questions including significant improvements in understanding the function of poison control centers ($p<0.01$), the use of the Drug Facts label to determine symptoms treatment ($p=0.01$), and the definition of active drug ($p<0.01$). **Conclusions:** A short education session can improve young student understanding of OTC medications including appropriate dosing and Drug Facts label usage.

"Analyzing Feeding Readiness Scale with Float Staff to Improve Patient Outcomes"

Poster 5, 11:10 a.m.-12:10 p.m., Activities Room
Presenter: Kirsten N. H. Burden (Pleasant Hill, OH)
Research Advisor: Cynthia Woodfield (Nursing, ONU)

Hospital staff demonstrate inconsistent use of the Feeding Readiness Scale for infants in the hospital setting. This scale includes physical indicators which correlate to scores and are used to anticipate the infant feeding to help determine appropriate time to feed an infant. Inappropriate interpretation of the feeding readiness scale can result in underfeeding or overfeeding infants. A Likert scale survey will be used to assess the current knowledge of the Float Staff who work on multiple floors throughout the hospital. An educational intervention derived from the survey results will be completed and will focus on improving staff compliance of the Feeding Readiness Scale to help improve patient outcomes. A post intervention survey will be done to assess for increased knowledge, understanding and staff compliance. Predicted results will improve infant safety while feeding and increase staff knowledge of the Feeding Readiness Scale.

"Apps for Business Students: The Utility of Google Apps for Business Curriculum"

Poster 12, 1:30-2:30 p.m., Activities Room
Presenter: Daniel Hadidon (Galloway, OH)
Research Advisor: Harry J. Wilson (Management & Geography, ONU)

The purpose of this project was to assess the worth of certain Google applications for use in business and, based on our findings, develop a 3000-level course that uses these applications to teach fundamental business concepts. With these goals in mind, we analyzed many of the applications within the suite of products that Google provides, including Google Maps, Fusion Tables, My Business, and others. These apps are readily available and free for downloading and using by everyone. We analyzed each app according to their respective purpose, functionality, ease-of-use, and interoperability with all popular platforms (Android and Apple phones and tablets, and PCs and Apple computers). We also considered the popularity of each application as an indication of its acceptance as well as its potential for continual use in the marketplace. We concluded that a few Google applications were important enough to warrant integrating into the curriculum of a new course, and that developing the course had merit in terms of providing our students with yet another valuable set of skills.

"Assessing Current Knowledge of Practices in Acute Perioperative Pain Management"

HONR 4, 11:30 a.m.-1 p.m., Bear Cave
Presenter: Sarah Miller (Elyria, OH)
Research Advisor: Kelly Kroustos (Pharmacy Practice, ONU)

Purpose: Considering the opioid epidemic that has affected Ohio, effective pain management has been recognized as a priority in recent years. This drug utilization evaluation and assessment focuses on updating health care professionals on best current practices for

managing pain in an acute perioperative setting via a continuing education (CE) presentation. Key points in the presentation will include 1) utilizing opioids safely and effectively while maximizing benefits and minimizing associated risks and 2) application of pain management guidelines to children, patients with cognitive impairment, and in patients with addiction. **Methods:** A literature review has been conducted, yielding evidence-based practices relating to pain management, and a retrospective drug utilization review has been conducted at a local community hospital to assess current practices. The CE presentation will be given to health care professionals at the hospital, and a pre- and post-survey based on a 5-point Likert Scale will be administered to participants assessing their knowledge of current guidelines. **Conclusion:** It is anticipated that many practitioners will be unaware of the multimodal approach to analgesia that is strongly recommended in the perioperative setting.

"Assessing Segmentation Data, A Case Study"

Poster 22, 1:30-2:30 p.m., Activities Room
Presenter: Madison M. Ross (Hinckley, OH)
Research Advisor: Harry J. Wilson (Management & Geography, ONU)

The purpose of this research is to assess the accuracy of marketing segmentations developed by ESRI software, the industry standard for geospatial analytics. Marketing segmentation is a common method for grouping areas according to the demographic characteristics and habits. This affords analysts an easy method to identify areas that have similar or different residents. We assess whether or not two Ohio ZIP codes are similar, according to their respective ESRI segmentation designations. We utilize ESRI Business Analyst software to examine demographic and consumer variables within each of the two ZIP codes to the block group scale, theorizing that this will reveal similarities and differences between the two groups. We concluded that the two ZIP codes do include residents who were predominantly similar, but that subtler differences between the two groups also exist. As an innovative method of validating our conclusions, we also employed Google Maps StreetView to virtually examine several neighborhoods in each ZIP code. This simple activity revealed more differences than we anticipated, and suggests that the two groups are not as similar as the ESRI segmentation data indicates. More research is needed to fully assess these preliminary findings.

"Assessment of ONU Research Participant Consent Forms"

HONR 4, 1-2:30 p.m., Bear Cave
Presenter: Kaitlin Bova (Erie, PA)
Research Advisor: Karen Kier (Clinical Pharmacy, ONU)

Research is a valuable component of many students' education at Ohio Northern with students participating in research and some conducting their own research. Informed consent is essential for ethical research practices and it must be obtained by the research team before each person participates in any type of research. The Institutional Review Board (IRB) serves to protect research participants by reviewing research study protocols and participant consent forms. Through this project, twenty-one consent forms from the 2016-2017 school year were assessed in collaboration with the ONU IRB. A rubric was created to score each consent form based on the inclusion of twelve basic elements of informed consent from the Health and Human Services Office for Human Research Protections, documentation of informed consent (signatures of the participant and research team member), and readability level less than eighth grade. Readability was assessed with the SMOG readability formula as suggested by the Center for Medicare and Medicaid Services. Results were shared with the ONU IRB and a template was created to assist ONU students and faculty in writing future consent forms. The purpose of the project is to protect students participating in research as well as minimize risks to the university and researchers.

"ATMAE Robot"

Poster 10, 12:20-1:20 p.m., Activities Room

Presenters: Dakota S. Miller (Forest, OH); Timothy J. Van Sickle (Ada, OH); Brady Michael Schulte (Ottawa, OH); Randy Baughman (Ada, OH)

Research Advisor: Paul Nutter (Manufacturing Technology, ONU)

The Team had to figure out a way to build a robot to complete the challenge that ATMAE had put out. This challenge was to do a relay race and pick up puzzle pieces the students had to put together later. The other challenge was to do an obstacle course which had a burlap climb and a teeter totter. After the teeter totter the robot had to follow an aluminum tape line and pick up blocks. Once all were picked up the students had to drive the robot back to the beginning and use an end effector and spell out ATMAE with the blocks. The students had a handful of months to get together and brainstorm ideas to complete the challenge. Along the way they were met with challenges. After the competition they were able to look back and see their mistakes and went back to fix them.

“Benefits and Barriers to Hourly Rounding”

Poster 17, 11:10 a.m.-12:10 p.m., Activities Room

Presenter: Nichole Reynolds (Ada, OH)

Research Advisors: Cynthia Woodfield (Nursing, ONU); Megan Lieb (Nursing, ONU)

The purpose of this research study is to identify nurses understanding the benefits and potential barriers of hourly rounding on a busy orthopedic hospital unit. This quality improvement project includes a pretest/posttest design administered to the nursing staff on this unit. The survey, which is designed in a Likert scale format, will assess staff understanding of the benefits of hourly rounding. Results of the pretest will guide the development of an educational intervention for the staff. Following this educational intervention, a post test will be provided to the nurses. It is predicted results will improve nurses understanding of the importance of hourly rounding to improve patient outcomes. This project is important for educating nursing staff on hourly rounding in order to decrease the number of patients that experience adverse outcomes while staying in the hospital.

“Bringing a Dog Park to Ada, OH”

Poster 14, 1:30-2:30 p.m., Activities Room

Presenter: Courtney M. Hendershot (Marietta, OH)

Research Advisor: Harry J. Wilson (Management & Geography, ONU)

The purpose of this research is to assess the demand for a new dog park in Ada, OH. I examined data that is relevant in this type of endeavor, such as local demographics and consumer spending habits. I especially focused on data pertaining to pets, such as the number of dog owners in Ada. I used ESRI Business Analyst GIS software for analysis and for developing maps, graphs, and charts that summarize my findings. This research is part of a greater initiative to bring a dog park to Ada. A committee comprised of local residents, business people, university students, and civic organizations are leading the initiative. We have already secured a commitment from the local park board who has agreed to dedicate land within the Ada War Memorial Park for the dog park. We are currently developing the business plan. My research is proving an integral part and will be used when we get to the fundraising stage of the project to help justify need.

“Bringing Kroger to Cuyahoga County”

Poster 19, 1:30-2:30 p.m., Activities Room

Presenter: Megan Thomas (Ada, OH)

Research Advisor: Harry J. Wilson (Management & Geography, ONU)

The purpose for this research is to assess the viability of a Kroger supermarket in Cuyahoga county. Kroger is popular in the western side of Ohio and the Columbus area. It appeals to a wide target market by providing groceries and other items that are generally of higher quality than those sold by the store's competitors. We utilized data pertaining to local demographics, consumer spending behaviors, and similar industries in the Cleveland area. ESRI Business Analyst GIS software provided the application for analysis, as well as

the means for developing summary maps, charts and tables displayed on our poster. Our analysis shows that Cuyahoga County would benefit from a Kroger, and that the store would be successful in this location.

“Bringing Target to Lima, OH”

Poster 17, 1:30-2:30 p.m., Activities Room

Presenter: Michael Chen (Ada, OH)

Research Advisor: Harry J. Wilson (Management & Geography, ONU)

The purpose of this study was to assess the worth of a new Target department store in Lima, Ohio. Target is a national chain department store that sells groceries, clothing, sports equipment, and other items. It is a popular competitor to similar stores such as Walmart and Meijer. I analyzed data common to studies of this kind, including demographics and consumer trends. I also examine the incidents and locations of competitors in the Lima area, as well as drive-time analysis to the proposed location of the new Target in Lima. ESRI Business Analyst software provided the platform for geospatial analysis. I conclude that a new Target would be successful in Lima, Ohio.

“Broselow Cart Implementation and its Effect on Staff Satisfaction in Pediatric Traumas”

Poster 20, 11:10 a.m.-12:10 p.m., Activities Room

Presenter: Kaitlyn E. Schellhouse (Casstown, OH)

Research Advisor: Cynthia Woodfield (Nursing, ONU)

The trauma bays in the Toledo Hospital emergency department are used for adult and pediatric trauma patients. Since there are significantly less pediatric traumas, emergency supplies are often hard to find and understocked. This leads to delays in patient care in instances when time is an essential part of improved patient outcomes. The purpose of this study is to determine the pediatric ER (Emergency Room) nursing staff satisfaction with the current system of supply storage and implementation of the Broselow cart. Clinical practice guidelines based on evidence in the literature will be developed to assist in the implementation of the Broselow cart for this department. A pretest, Likert type questionnaire will be distributed through hospital email to the ER nursing staff at the emergency department. The predicted results of this quality improvement project could improve staff satisfaction regarding the storage of pediatric trauma and resuscitation supplies if the Broselow cart were to be implemented. In addition, patient outcomes will improve secondary to easier access to emergency supplies during trauma situations.

“Building a Better Digital Identity”

Poster 14, 12:20-1:20 p.m., Activities Room

Presenter: Ryan M. Strawser (Lewis Center, OH)

Research Advisor: Heath LeBlanc (Electrical & Computer Engineering, ONU)

This work considers the use of digital identity from the consumer perspective to corporate levels. Because of increasing integration of the Internet within our everyday devices, exploitation and cyber-crime have also been increasing. This trend calls for consumers to be more security conscious and responsible for their actions online. If more consumers understand the marks they make with their digital footprints, it will help companies better secure their clients and possibly even lower the rates of cybercrime. The digital footprint of a consumer is captured by the digital identity. Digital identity is the collection of digital characteristics, behavior, pieces of physical identity, and personal information. Protecting a digital identity can be done through risk distribution. In case an attacker gains access to an application with personal credentials submitted, the attacker cannot obtain all the information as parts of the digital identity are stored at different locations. However, the larger problem at hand after a company has secured its consumer's credentials, is the actions of the consumer. In summary, we will discuss how manageable it is to help protect a consumer-level digital identity from online threats in

conjunction with anonymization methods and judicious internet behaviors.

“Building a Robotic Football Quarterback”

Poster 19, 12:20-1:20 p.m., Activities Room

Presenters: Josh Gedert (Toledo, OH); Jordan Reeves (Belle Center, OH); Aaron Johnson (Wapakoneta, OH); Dillon Brancheau (Auburn Hills, MI); Nathan McCown (Newark, OH)

Research Advisors: Firas Hassan (Electrical & Computer Engineering, ONU); Louis DiBerardino (Mechanical Engineering, ONU)

Robotic football involves a tournament of 8-on-8 robots, where the competition follows NCAA football rules. This year, the robotic football team is developing a quarterback with tracking functionalities. The tracking system integrates vision detection and distance finding using the Pixy CMUcam5 and the ultrasonic range finder, respectively. The throwing mechanism utilizes the data from the tracking system to adjust the throwing angle and speed, and it throws the football to the wide receivers. Extensive research was completed during the design phase of the tracking system and throwing mechanism. The robotic football quarterback is controlled by a human via a PS3 controller. The commands initiated from the PS3 controller are sent to the Arduino Mega with Bluetooth capabilities using the USB host shield. Depending on the command sent, the Arduino sends signals to the components within the robot to perform the desired actions. For example, pressing the X button on the PS3 controller prompts the Arduino to send a signal to the linear actuator in order to move the football into the throwing wheels. It is expected that this semi-autonomous robot will eliminate some human involvement, which will decrease human error during the game. Therefore, the quarterback will provide accurate passing.

“Campus Commuter Programs”

Paper 2, 11:50 a.m.-1:30 p.m., Room 202

Presenter: Mackenzie Nichole Zembower (Ada, OH)

Research Advisor: Mark Cruea (Communication Arts, ONU)

The Campus Commuter Program project looks into how ONU currently serves its commuter students and ways to improve meeting the needs of these students. The project gathered feedback, ideas, and recommendation of current ONU commuter students via a survey. It also evaluates and compares the success of programs from peer institutions. The goal of this project is to create a successful and ideal program that could not only be implemented at ONU but also improve retention numbers.

“Chick-Fil-A at ONU”

Poster 15, 1:30-2:30 p.m., Activities Room

Presenter: Emily A. Pfoff (Harrod, OH)

Research Advisor: Harry J. Wilson (Management & Geography, ONU)

My research analyzes the worth of a Chick-Fil-A on the ONU campus. Chick-Fil-A is a popular upscale fast food restaurant that has a menu promoting entrees with chicken. Chick-Fil-A is third in most popular fast food restaurant and loved by the college age group genre. It is a successful and popular alternative to fast food restaurant such as McDonalds, Wendy’s and Burger King which have hamburger-based menus. For researching this idea, I rely on informal discussions with other ONU students who live on campus. I also employ geospatial analysis of demographic and consumer data utilizing ESRI Business Analyst GIS software. Bringing Chick-Fil-A to ONU would provide students the option of different meals to eat when using their points or meal swipes. It would also provide a closer alternative than the three fast food restaurants currently in Ada. I also conclude that it would also positively impact on the village by hiring local residents and increasing the economic base.

“Civil Implications of Three-Dimensional Bioprinting”

Paper 3, 11:50 a.m.-1:30 p.m., Room 202

Presenter: Holly R. Dyer (Tampa, FL)

Research Advisor: Lisa Robeson (English, ONU)

Advancements in three-dimensional bioprinting research suggest a need to evaluate the practical and ethical uses of the technology. Fully functioning, synthetic organs and tissues have the potential to cure almost any human disease, so their use in the civilian health sector raises legal and ethical issues. Public unlimited access to this technology could extend lifespans indefinitely. Individuals of high socioeconomic status may be able to afford the technology, though impoverished individuals would continue to face mortality on a definite scale. Additionally, the transplant of a bioprinted organ foreshadows ownership disputes between the cell donor, recipient, and transplanting organization. In general, the establishment of ethical bioprinting policies in the health sector would be implausible. Consequently, the integration of bioprinting into medical practice is not presently appropriate. While these ethical considerations may be overwhelming, bioprinting research should continue. The technology has been critical to many recent advancements in regenerative medicine and will continue to enhance our understanding of processes such as tumoral response to toxins, if permitted by ethical committees.

“Code Cart Medication Trays: Novel Resource and Design Implementation - Phase 2”

Poster 13, 10-11 a.m., Activities Room

Presenter: Isabel E. Cwikla (Norridge, IL)

Research Advisors: Mary Burkhardt (VA Ann Arbor Healthcare System); Valerie Miller (VA Ann Arbor Healthcare System)

Faculty Sponsor: Kelly Kroustos (Pharmacy Practice, ONU)

Emergency situations requiring the use of code carts are especially high risk for medication errors due to diverse teams working together in unfamiliar, high stress situations among other risk factors. Therefore, it is crucial for code cart medication trays to incorporate an intuitive design to streamline medication retrieval. Since the previous medication tray design utilized by the VA Ann Arbor Healthcare System obscured medication labels, our goal was to redesign it to improve accuracy of medication retrieval and decrease time of retrieval. This will reduce risk of selection error under stress and improve patient safety. External resources were utilized to redesign medication trays to be more intuitive and versatile with the anticipation of future changes in tray contents and medication packaging. 6 mock code scenarios compared speed and accuracy of medication retrieval by 23 ICU nurse participants. Participants were surveyed following usability test completion regarding insight on the new medication tray design compared to the previous design. Comparative analysis revealed significantly faster retrieval time, reduced occurrence of erroneous retrievals, and higher incidence of reading medication labels compared to the original design.

“Comparison of at-Home Strengthening and Balance Exercises Using BESS Test”

Poster 3, 12:20-1:20 p.m., Activities Room

Presenters: Aaron M. Smith (Westerville, OH); Steven G. Feucht (Grove City, OH)

Research Advisors: Kurt Wilson (Athletic Training, ONU); Michelle Wilson (Athletic Training, ONU)

This study aims to examine the effects of at-home balance and ankle strengthening programs on an athlete’s balance. This is important because ankle sprains are among the highest common orthopedic injuries and lack of balance has been shown to be a predisposing factor to ankle sprains. Although there are already programs to help athletes improve their balance, these programs require the athlete to come in for the session and typical run for about 30 mins to an hour. This study hopes to find a quick and easy program athletes can do at home, on their own time to improve their balance. The study hypothesizes that both the strengthening group and the balance group will show improvements in their balance. Also that the balance group will show even more improvement than the strengthening group.

“Comparison of FEV1/FVC Ratio between Athletes and Vocal Musicians”

Poster 5, 12:20-1:20 p.m., Activities Room
Presenters: Maggie Goeller (Dayton, OH); Ashley Grisnik (Bay Village, OH); Taylor L. Hoffman (New Richmond, OH)
Research Advisors: Vicki Motz (Biological Sciences, ONU); Rema Suniga (Biological Sciences, ONU)

The FEV1/FVC ratio (the percent of vital capacity that can be exhaled in one second), is greater in athletes and choir singers, than in people who don't breathe deeply in their daily activities. Myriad factors influence FEV1/FVC, including gender, body size, and length of exposure to deep breathing. To determine whether prolonged participation in soccer or choir had greater influence on forced expiration, non-smoking, college aged males between 5'5"-6'5" and 150-250 pounds who participated for at least 4 years in soccer (n=7), choir (n=7), or no major aerobic activity (control) (n=7), were tested using an ADI spirometer (MLT300L). Each subject was tested before and after an hour long practice of their group specific activity. Singers had significantly higher baseline FEV1/FVC than either the control group or the soccer players (ANOVA: $F=3.93$, $p=0.038$; Student's t-test: $p=0.008$, $p=0.018$ respectively), but no significant difference was seen between the soccer players and the control group ($p=0.331$). No significant change was seen in FEV1/FVC between groups after 1 hour of the specified activity (ANOVA: $F=0.34$, $p=0.823$). This was likely due to the large standard deviation in percent change (1.64 ± 2.05 in the control group, 3.25 ± 7.40 in soccer, and 2.98 ± 4.49 in singers). It was expected that the athletes would have the highest FEV1/FVC, however, it was found that singers have the highest FEV1/FVC, indicating that the breathing pattern associated with choir singing increases respiratory efficiency.

"Correlation Between the Immorality of Slavery in the United States and Economic Benefits"

Paper 3, 10-11:40 a.m., Room 202
Presenter: Alex Paul Yakos Brown (Convoy, OH)
Research Advisors: Mark Dixon (Philosophy, ONU); Samantha Howe (Political Science, ONU)

I am taking a look at how, if at all, slavery benefited United States and their economics. It is widely known and accepted that slavery was a moral disaster that the United States wished they could wipe away from their history. But what did we gain from it? Is it possible we wouldn't be where we are today without it?

"Decreasing Surgical Site Infection Rates on Medical Surgical and Intensive Care Units"

Poster 7, 11:10 a.m.-12:10 p.m., Activities Room
Presenter: Amy Nicole Bauman (Napoleon, OH)
Research Advisors: Megan Lieb (Nursing, ONU); Cynthia Woodfield (Nursing, ONU)

Longer hospital stays lead to increased costs for both patients and the hospital. Patients spend extra days in the hospital due to hospital acquired infections including surgical site infections. The purpose of this quality improvement project is to educate the medical surgical and ICU (Intensive Care Unit) staff about ways to reduce surgical site infections. A pretest survey will assess staff understanding of surgical infection risk and knowledge of effective prevention of infection. Results of the survey will guide the development of a pamphlet centered on evidence based practice for the current guidelines on reducing surgical site infections. This pamphlet will be presented as an educational intervention to the staff. A posttest survey will be administered to the staff to determine if knowledge of infection risk and prevention has increased. It is expected increased staff knowledge of surgical infection risk and prevention will lead to improved patient outcomes.

"Delirium vs. Dementia: Determining the Difference to Improve Patient Outcomes"

Poster 1, 11:10 a.m.-12:10 p.m., Activities Room
Presenter: Jessica L. Plaughter (Wapakoneta, OH)
Research Advisors: Christina Liebrecht (Nursing, ONU); Cynthia Woodfield (Nursing, ONU)

The terms delirium and dementia are often used interchangeably in healthcare. However, these two concepts are separate entities and must be treated differently. In acute healthcare settings, it is important for nurses to understand the difference between these two medical conditions to better assess and care for patients experiencing one or the other. The purpose of this quality improvement project is to assist nursing staff in determining the presence of either delirium or dementia in patients, and identify when psychology consult is needed. This project takes place on an orthopedic/neurological hospital unit and consists of a pre-test and post-test design which will evaluate the knowledge of nursing staff regarding delirium and dementia. My research will offer education to nursing staff regarding this topic and how to assess and care for this population of patients. The goal of this project is to improve patient outcomes by appropriately communicating and treating patients experiencing confusion, whether it be acute or long-term. Expected results will reflect a better understanding of the difference between delirium and dementia from nursing staff, leading to improved patient care and outcomes.

"Design Development of an Over-the-Counter Medication Mobile Application to Promote Safe, Reliable, and Effective Self-Care"

HONR 5, 1-2:30 p.m., Bear Cave
Presenter: John Mostowy (Mason, OH)
Research Advisor: Kristen Sobota (Pharmacy Practice, ONU)

Patients that are uncomfortable with speaking to pharmacy personnel attempt to treat themselves with over-the-counter products without a professional recommendation. This methodology can lead to improper treatment of the condition, worsening of the condition, and unnecessary purchases of ineffective medications. iOTC is a mobile application that bridges the gap between a patient's independence to self-care and ensuring recommendations are from a safe and reliable source. iOTC uses a detailed electronic algorithm that works by gathering data inputted by the user, such as medical history, and prompts questions relating to the patient's current illness to suggest an appropriate over-the-counter medication. Utilization of this application would promote improved safety and efficacy when patients choose a medication, as the software also educates the patient about the drug prior to purchase and use. The benefits of this application extend beyond the convenience for the user, however, and helps reduce breaks in pharmacy workflow. Often times patients may question pharmacy employees on over-the-counter medicine when high-volume pharmacies are busy, slowing down the efficiency of prescription production or other workstations. iOTC ensures the patient makes an educated decision in over-the-counter medication self-care without needing that extra interaction, while providing a safe and reliable recommendation.

"Diet Implications of Civet Cats (Subfamily Paradoxurinae) from Low Magnification Dental Microwear Examinations"

Poster 8, 12:20-1:20 p.m., Activities Room
Presenter: Sophia Mae Beery (Findlay, OH)
Research Advisor: Timothy Koneval (Biology, ONU)

The subfamily Paradoxurinae consists of four genera of southeast Asian civet cats; *Arctogalidia*, *Arctictis*, *Paguma*, and *Paradoxurus*. The novelty of this study is that it examines the dental microwear of an understudied group of reportedly frugivorous members of the Order Carnivora. Upon the completion of the dental microwear analyses the diet should be more accurately depicted and an understanding of this group's diet can be made. Currently little is known about the behavior or diet of Paradoxurinae, but they are claimed by some to be frugivorous; this study should answer some of the dietary questions. Molds of both the left and right upper M1 and M2 were taken, cast, and analyzed under a low magnification stereoscope. The prediction is that the members of this subfamily will have microwear similar to that of a frugivore. In this study a known carnivore, frugivore, and omnivore (*Gulo*, *Potos*, and *Ailurus* respectively) were included to assist in determining diet of the Paradoxurinae.

“Differential Effects of Kappa Opioid Receptors in the Nucleus Accumbens and Ventral Tegmental Area on the Aversive Effects of Nicotine”

Poster 7, 10-11 a.m., Activities Room

Presenters: Melissa A. Ward (Columbus, OH); Saleh Alqifari (Buraydah, Saudi Arabia)

Research Advisor: Manoranjan D'Souza (Pharmacology, ONU)

Objectives: To assess the role of kappa opioid receptors (KORs) in the nucleus accumbens (NAcc) and ventral tegmental area (VTA) in the aversive effects of nicotine. **Methods:** Nicotine-induced aversive effects were measured using the conditioned taste aversion model, which utilizes two unsweetened flavored solutions (e.g. grape and cherry) and a conditioning procedure with nicotine [0.4 mg/kg, base; subcutaneous (s.c.)] and saline. Separate groups of Wistar rats were implanted with a cannulae located either above the NAcc or VTA. KOR agonist \pm U50488 (0, 0.3, 3 ug/0.5ul/side) was injected directly in the NAcc prior to conditioning with nicotine. Similarly, the KOR agonist \pm U50488 (0, 0.3 ug/0.5ul/side) was injected directly in the VTA prior to conditioning with nicotine. Changes in preference for the nicotine-associated flavored solution was used as an index of nicotine-induced aversive effects. **Results:** Direct injections of the KOR agonist (3 ug/0.5ul/side) directly into the NAcc increased the aversive effects of nicotine. In contrast, direct injections of low doses of the KOR agonist (0.3 ug/0.5ul/side) directly into the VTA decreased the aversive effects of nicotine. **Conclusions:** Together, these results suggest that KORs in the NAcc and VTA play opposite roles in the aversive effects of nicotine.

“Discharge Satisfaction: Reasons for Delays and Ways to Improve Patient Satisfaction”

Poster 15, 11:10 a.m.-12:10 p.m., Activities Room

Presenter: Suzanne C. Young (Ada, OH)

Research Advisor: Cynthia Woodfield (Nursing, ONU)

The General Medical unit at Nationwide Children's Hospital is known for its high patient satisfaction ratings. Low discharge satisfaction ratings for one unit due to delays in the discharge process, brings down overall patient satisfaction score. The purpose of this quality improvement project is to identify the causes of discharge delays, assess the nurses' confidence in presenting discharge information, and identify ways to improve discharge procedure. Surveys will be administered to all nurses on the General Medical unit to determine current causes of discharge delays. Survey questions will also determine the nurses' ability, confidence, and routine while presenting discharge information to patients and families. An educational intervention will be developed and presented to the nursing staff in an online format. The educational intervention will address issues related to patient discharge and ways to improve the process. A posttest survey will be administered one week and again one month after the educational intervention to identify changes in nurses' overall ability completing patient discharge in a timely fashion. It is predicted nurses will use the information from the educational intervention to decrease discharge delays and improve patient outcomes.

“Dramaturgy for the International Play Festival”

Paper 4, 11:10 a.m.-12:30 p.m., Deans' Heritage Room

Presenter: Erica Gabel (Fostoria, OH)

Research Advisor: Joan Robbins (Theatre Arts, ONU)

The focus of my research is on the play *Prometheus: The Beginning* by Ramon Griffiro. In my presentation, I will first briefly discuss the role of the dramaturg and how he/she becomes a resource to the actors for background information on the playwright and the context of the play. Next, I will talk about the research I developed in order to prepare the actors for performance. After reading the first couple drafts of the script, I started compiling a glossary of terms that might be unknown to the actors, to give them context. I also studied the myths that were present in the script, which ranged from a number of different cultures. I looked into the history of Chile under Pinochet's rule, as well as background on the playwright, so the actors could

understand the context of the play. I collaborated with Dr. Joan Robins, as well as the translator, Adam Versenyi, and director, Michael Licata. Before rehearsals started, I sat in on a conference call with them to get a stronger understanding for the background and script. After gathering research, I put together a binder with the information I found to share with the actors.

“Drug Utilization Review of Reversal Agents Used to Treat Patients Experiencing an Intracranial Hemorrhage on NOACs”

HONR 2, 1-2:30 p.m., Bear Cave

Presenter: Olivia Henton (Olmsted Falls, OH)

Research Advisors: Lindsey Peters (Pharmacy Practice, ONU);

Brittany Bates (Pharmacy Practice, ONU)

The novel oral anticoagulants (NOACs) are medications utilized to prevent or treat blood clots. Warfarin (Coumadin), an anticoagulant, has been used as the mainstay of treatment since its FDA approval in 1954. Beginning in 2010, the NOACs including dabigatran (Pradaxa), rivaroxaban (Xarelto), apixaban (Eliquis), and edoxaban (Savaysa) were approved by the FDA for various indications. By reducing the incidence of clot formation and treating clots that have already formed, the use of these medications inherently places the patient at an increased risk of bleeding. Unlike warfarin and dabigatran, the other NOACs do not have a specific antidote to reverse the drug's effect. This can be troublesome if a NOAC-treated patient experiences a major or life-threatening bleed, such as an intracranial hemorrhage (ICH). When a patient on a NOAC presents to the emergency department with an ICH, agents such as fresh frozen plasma (FFP) and prothrombin complex concentrate (PCC) can be used to minimize the bleeding. Because there are no specific antidotes available, current treatment guidelines simply recommend an evidenced based, appropriate method of reversal. To assess current trends in treatment, a drug utilization review of reversal agents used in intracranial hemorrhage patients at two local hospitals will be performed.

“Early Ambulation after Open Heart Surgery: Policy vs. Practice”

Poster 8, 11:10 a.m.-12:10 p.m., Activities Room

Presenter: Tyler Mason Turner (Cassstown, OH)

Research Advisor: Megan Lieb (Nursing, ONU)

There are a number of health goals patients meet after open heart surgery, but early ambulation is the most crucial to positive patient outcomes. Early ambulation is associated with the patient returning to effective ambulation more quickly, preventing muscle wasting, and preventing respiratory infections. The purpose of this quality improvement project is to develop and deliver an educational intervention for the staff of the CVICU (Cardiovascular Intensive Care Unit) to increase the number of post-operative patients successfully completing early ambulation. Nursing staff will complete a Likert scale, anonymous survey prior to receiving education on the importance and benefit of early ambulation of post open heart surgery patients. An educational intervention will be developed based on the results of the pretest survey answers. A post-test survey will be administered and will measure improved staff understanding of the importance of early ambulation in post surgical patients who are on this floor. Predicted results following this quality improvement project includes an increased understanding of the value of early ambulation resulting in a higher number of patients being ambulated early in post open heart surgery patients.

“Effect of pH on Soluble Phosphate in Soils”

Poster 23, 10-11 a.m., Activities Room

Presenter: Anne Marie McElwee (Cardington, OH)

Research Advisor: Christopher Spiess (Chemistry, ONU)

Phosphorus, in the form of phosphate, is an essential nutrient for plants, playing a key role in energy transformation and growth. Because of its importance to plants, farmers often add fertilizers which contain phosphate to their fields to supplement that which is naturally in the soil. The pH of the soil environment affects the solubility of phosphate contained within it and, therefore, its

availability to plants and potential for leaching. Leaching of phosphate into waterways leads to water eutrophication, which can cause harmful algal blooms. In agricultural soils, harvesting and management practices such as liming can cause the pH to fluctuate over time. It is thus important to understand how pH affects the solubility of phosphate. In this study, a variety of soils were subjected to experiments where dissolved phosphate was measured as a function of pH. Several of the soils were found to have a minimum phosphate solubility between pH 6 and pH 7. For other soils, the minimum occurred at a higher pH. Attempts were made to determine what components of the soil may have caused these results.

“Efficient Synthesis and Characterization of Thioether Appended α -imino Pyridines and Corresponding Cu²⁺ Metal Complexes”

Poster 19, 10-11 a.m., Activities Room
Presenter: Michael James Murray (Strongville, OH)
Research Advisor: Bradley Wile (Chemistry, ONU)

Details of the characterization and efficient synthesis of thioether appended α -imino pyridines will be reported. Ligand synthesis was optimized and complete characterization was completed on each of the substituted ligands, featuring variations in the substitution of the thioether arm. The corresponding copper metal complexes were characterized by a combination of UV-Vis, NMR, and magnetic susceptibility.

“Encouraging Mastisol Use to Prevent Central Line Associated Bloodstream Infections (CLABSI)”

Poster 16, 11:10 a.m.-12:10 p.m., Activities Room
Presenter: Mitchell James Stierwalt (Fremont, OH)
Research Advisor: Megan Lieb (Nursing, ONU)

Mastisol is a non-water soluble liquid adhesive to help reinforce the integrity of central line dressings. The use of Mastisol helps prevent the patient from developing hospital-acquired infections such as central line associated bloodstream infections (CLABSI). The purpose of the study is to encourage the use of Mastisol on the central line dressings, thus decreasing the patient’s risk of developing CLABSI. This quality improvement project will be completed on the adult ICU (Intensive Care Unit) at ProMedica Toledo Hospital. A pre-survey will be by the nurses who work on the adult ICU and will assess their knowledge about Mastisol use. After the pre-survey is administered, an educational intervention will be developed regarding the use of Mastisol and the positive impact on patient outcomes. In addition, a poster highlighting important points from the educational intervention will be posted in the break room on the unit. Lastly, a data sheet will be available for the charge nurse to monitor the frequency Mastisol is used during central line dressing changes. A post-survey will be issued assessing the nurses’ perspectives on Mastisol and how it may have impacted patient infection rates.

“Energy Audit for Taft Memorial and Sustainability Efforts”

Poster 12, 12:20-1:20 p.m., Activities Room
Presenters: Eric Daulton Radford (Upper Sandusky, OH); Brady Michael Schulte (Ottawa, OH)
Research Advisors: Richard Miller (Technology, ONU); Trevor Robinson (Technology, ONU)

How much does it cost to run a technology program, like that of The department of technological studies? What can be done to lower the cost and how much will it cost to use less electricity. How long will the advancements take to pay off? What are other reasonable efforts that can help lower the cost of electricity? Can this be applied to other buildings on campus?

“Entertainment Park in Ada”

Poster 16, 1:30-2:30 p.m., Activities Room
Presenter: Jordan R. Bostater (Bryan, OH)
Research Advisor: Harry J. Wilson (Management & Geography, ONU)

My research was to show the potential market for a go-cart/putt-putt park in Ada, Ohio. I looked at many different factors that would come

into play in order to make this a successful business. I used ESRI Business Analyst GIS software to analyze demographic and consumer data. Variables for analysis included family incomes, average household age, money spent on entertainment of this kind, and others commonly used in similar research. I conclude that this new business in Ada would be profitable and successful. Ada City Schools and Ohio Northern University would provide most of the customers and also employees. It would provide a regional destination location for those seeking a unique and exciting form of entertainment.

“Evaluating Nursing Knowledge of Pain Assessment in Mechanically Ventilated Adults”

Poster 2, 11:10 a.m.-12:10 p.m., Activities Room
Presenter: Jessica Niese (Leipsic, OH)
Research Advisor: Megan Lieb (Nursing, ONU)

Mechanically ventilated patients face a multitude of complex issues associated with the reason for their intubation and side effects of sedation medication. Ventilated patients often face negative outcomes related to over-sedation, including prolonged length of stay and increased time on ventilator support. The purpose of this study is to evaluate the knowledge of intensive care unit nurses in regards to pain assessment and sedation protocols of ventilated patients and identify areas requiring education. A pretest consisting of a Likert scale will be administered to the nursing staff on the unit to identify knowledge deficits regarding assessment via the Critical-Care Pain Observation Tool (CPOT), followed by education and a posttest to assess for knowledge gained. It is expected that the nurses’ knowledge and utilization of the education material will increase in the posttest when compared to the pretest. These results can then be applied to further education, remediation, or competency work based on the unit manager’s preference.

“Evaluation of a New ASCP Outreach Initiative: Falls Prevention for Seniors”

HONR 1, 11:30 a.m.-1 p.m., Bear Cave
Presenter: Cassandra L. Hacker (Huntington, IN)
Research Advisors: Kelly Kroustos (Pharmacy Practice, ONU); Kristen Sobota (Pharmacy Practice, ONU)

Problem: The American Society of Consultant Pharmacists chapter at ONU created an outreach initiative focused on preventing falls among seniors, implemented in September 2016. The goal of the program is to educate seniors on falls prevention, while engaging all levels of pharmacy students in professional development and teamwork. This project evaluates the outreach’s success, and outlines a continuous improvement plan. **Methods:** Participating students received falls prevention training, and took surveys before and after completing their first outreach event. The survey assesses students’ opinions on the teamwork design, confidence in patient interactions, and perceived opportunities for professional development. Events involved assessing patients’ apartments for safety, and conducting medication reviews. Patient satisfaction surveys were also completed and collected. A statistical analysis of the data is in progress. To develop a continuous improvement plan, a SWOT analysis was completed. **Results:** The statistical analysis is expected to show improvement in student confidence, and agreement that the outreach provided valuable opportunities for professional development. However, few opportunities were available for older students to work with younger students due to class schedules, making this aspect difficult to assess. **Conclusion:** Although we believe the overall outreach to be successful, ASCP will continue to improve the program.

“Evaluation of Multiple Methods of Detecting Beta-Lactam-Induced Vancomycin Resistance in Staphylococcus aureus”

HONR 4, 10-11:30 a.m., Bear Cave
Presenters: Sarah E. Bova (Erie, PA); Angela J. Rademacher (Louisville, OH)
Research Advisor: Steven Leonard (Pharmacy Practice, ONU)

Treating methicillin-resistant *Staphylococcus aureus* (MRSA) is challenging as susceptibility to vancomycin (VAN) decreases and VAN non-susceptible strains of *Staphylococcus aureus* emerge. Recent publications suggest synergy when combining beta lactams with VAN, however other studies warn of possible beta lactam induced VAN resistance (BIVR). Results from a 2013 study by Leonard showed the one year prevalence of BIVR in a single hospital to be between 0% and 13.24% depending on the method used. Further research in 2016 showed inconsistent results with no strains testing consistently positive by all three methods. The purpose of this study was to narrow the number of MRSA strains examined and expand the number of beta lactams tested. Five *Staphylococcus aureus* isolates that tested positive for BIVR multiple times in previous studies were used. In the first method (no preculture), overnight growth from Mueller Hinton broth was adjusted to an OD 578 of 0.3 and the suspension was streaked onto a brain heart infusion agar containing 4 ug/mL vancomycin. When dry, 8mm paper discs containing 10 ug/mL ceftizoxime (CZX), 10 ug/mL cefazolin (CFZ), 10 ug/mL penicillin G (PCG), 100 ug/mL piperacillin (PIP), or 25 ug/mL amoxicillin (AMX) were placed in the center of each respective plate and incubated at 37 C for 48 hours. In the second method (preculture), overnight growth from Mueller Hinton broth containing 10% of the disc concentration of each respective antibiotic was adjusted to an OD 578 of 0.3 and tested as above. Presence/absence of zones/rings of growth and zone/ring size where possible were recorded. Presence of a zone or ring of growth of any size around the disc was considered positive for BIVR. Mu3 was used as a positive control and ATCC 29213 was used as a negative control. All strains were tested in duplicate.

"Evaluation of Nursing Adherence to Isolation Precautions"

Poster 4, 11:10 a.m.-12:10 p.m., Activities Room

Presenter: Brooke N. Kennedy (Grand Rapids, OH)

Research Advisors: Cynthia Woodfield (Nursing, ONU); Megan Lieb (Nursing, ONU)

The background of this study focused on the high prevalence of patients in the hospital setting who are in isolation precautions, and nursing staff adherence to policy pertaining to these situations. This quality improvement project evaluates the association between knowledge of hospital policy and adherence to isolation precautions. A ten-question pretest addressing the current hospital policy and identification of the proper use of precautions for contact light, contact, contact plus, droplet and airborne isolation will be issued to day and night shift nursing staff on a 30 bed specialized unit in Northwest Ohio. Results of the pretest will guide the development of an education intervention for nursing staff using a pamphlet-style visual aid describing each type of isolation. Nurses were provided a small visual aid attached to their badge clip for quick reference access. Predicted conclusions will build upon the results, explaining the use of educational tools to increase knowledge of isolation policy in order to promote adherence to precautions taken, along with barriers to adherence from nursing staff.

"Evaluation of School Selection Process of Current Pharmacy Students"

HONR 5, 10-11:30 a.m., Bear Cave

Presenter: So-Hee Choi (Seoul, South Korea)

Research Advisors: Kelly Shields (Pharmacy Practice, ONU); Bob Trusz (Pharmacy, ONU)

The purpose of the project is to evaluate the school selection process of current pharmacy students. This will be done via a survey link, where students can anonymously answer questions, will be sent out to P1 through P6 students. There will be about 10 questions asking about demographic information as well as factors impacting their decision in choosing pharmacy program. By collecting this data, the pharmacy school administration office will be able to see not only the positive feedbacks, but also identify areas that need improvements in admission processes. Therefore, in the future, these data could be used positively by the pharmacy school when making changes in both administrative processes and recruiting efforts.

"Fall Prevention Strategies Related to Orthostatic Hypotension"

Poster 13, 11:10 a.m.-12:10 p.m., Activities Room

Presenter: Taylor McCabe (Columbus, OH)

Research Advisor: Cynthia Woodfield (Nursing, ONU)

Medications prescribed on cardiovascular units improve patient condition by improving heart functioning. These medications are prescribed routinely and side effects of the medications pose a potential danger to patients. One dangerous side effect of cardiac medications is orthostatic hypotension which leads to syncope that can result in severe injury. On the Cardiac Intermediate Care Unit (CIMCU), a pre- and post-survey regarding nurse interventions was used for patients experiencing orthostatic hypotension. An educational intervention will be developed guided by the survey results. An exploration of evidence based interventions will be completed. A post test will be distributed following the educational intervention. Predicted results will increase staff understanding of how to prevent syncope in patients who are prescribed cardiac medication leading to orthostatic hypotension.

"Fever Management Practices in the Intensive Care Unit Setting"

Poster 14, 11:10 a.m.-12:10 p.m., Activities Room

Presenter: Alexandria Thacker (South Bloomfield, OH)

Research Advisor: Cynthia Woodfield (Nursing, ONU)

Currently, there is no protocol guiding intervention for febrile patients at Mount Carmel West Hospital. The purpose of this project is to improve patient safety and outcomes of febrile patients through evidence based research and subsequent nurse education. This project will consist of a pre and post Likert scale survey that assesses currently used fever interventions (both pharmacological and non-pharmacological). An educational session will be developed and presented to nursing staff members on the medical cardiac intensive care unit. This educational intervention will include evidence based research from best practice guidelines currently available in the literature. The predicted outcomes of this quality improvement project will illustrate ICU nurses understanding of the best way to manage patient fever in the absence of a protocol. The future implications of the educational session are to create the necessary changes in fever management practices in the critical care setting so to better patient outcomes.

"FKBP5 Polymorphisms Influence Pre-Learning Stress-Induced Alterations of Learning and Memory"

Poster 1, 10-11 a.m., Activities Room

Presenters: Brianne Mosley (Bremen, OH); Tessa Duffy (Wilmington, OH); Kelsey Hess (Danville, PA); Mackenzie R. Riggenbach (Convoy, OH); Leighton Wireman (Elida, OH); Jennifer Hipskind (Ada, OH); Julie Handel (Rochester, NY); Moriah Roseler (Ada, OH)

Research Advisor: Phillip Zoladz (Psychology, ONU)

FK506 binding protein 51(FKBP5) is a co-chaperone of heat shock protein 90 and significantly influences glucocorticoid receptor sensitivity. Single nucleotide polymorphisms (SNPs) in the FKBP5 gene are associated with altered hypothalamus-pituitary-adrenal (HPA) axis function, changes in the structure and function of several cognitive brain areas, and increased susceptibility to post-traumatic stress disorder, major depression, bipolar disorder, and suicidal events. The mechanisms underlying these associations are largely unknown, but it has been speculated that the influence of these SNPs on emotional memory systems may play a role. In the present study, 112 participants were exposed to the socially evaluated cold pressor test (stress) or control (no stress) conditions immediately prior to learning a list of 42 words. Participant memory was assessed immediately after learning (free recall) and 24 h later (free recall and recognition). Participants provided a saliva sample that enabled the genotyping of three FKBP5 polymorphisms: rs1360780, rs3800373, and rs9296158. Results showed that stress impaired immediate recall in risk allele carriers. More importantly, stress enhanced long-term recall and recognition memory in non-carriers of the risk alleles, effects that were completely absent in risk allele carriers. Follow-up analyses revealed that memory performance was correlated with

salivary cortisol levels in non-carriers, but not in carriers. These findings suggest that FKBP5 risk allele carriers may possess a sensitized stress response system, perhaps specifically for stress-induced changes in corticosteroid levels, which might aid our understanding of how SNPs in the FKBP5 gene confer increased risk for stress-related psychological disorders and their related phenotypes.

“Fluoxetine Does Not Prevent Increased Voluntary Ethanol Consumption in a Predator-Based Psychosocial Stress Model of PTSD”

Poster 3, 10-11 a.m., Activities Room

Presenters: Robert Rose (Newark, OH); Brooke Kohls (Clarksville, OH); Megan Heikkila (Shaker Heights, OH); Brooke J. Hertenstein (Troy, OH); Kiera Robinson (Findlay, OH); Kasey Mucher (Arlington, TX); Madelaine Huntley (Ada, OH); Paul D'Alessio (Ada, Ohio)

Research Advisor: Phillip Zoladz (Psychology, ONU)

We previously reported that, contrary to our expectations, chronically stressed rats consumed significantly less ethanol than non-stressed rats. We speculated that, because rats in this study had not been exposed to ethanol prior to the stress manipulations, they may have consumed less ethanol due to neophobia. Here, we have tested this possibility, as well as whether chronic fluoxetine treatment would prevent any newly observed effects. Prior to the stress manipulations, male Sprague-Dawley rats were given access to either ethanol (10% EtOH + 1% sucrose) or water (1% sucrose) in 12-hr cycles (1930-0730 every night) using a two bottle, free choice test for 21 days. Beginning on the day after this ethanol pre-exposure period, rats were exposed to psychosocial stress or control conditions for 31 days. Stressed rats were given two cat exposures, separated by 10 days, and subjected to daily social instability throughout the paradigm. Control rats were handled daily. One group of stressed rats was also given fluoxetine in their drinking water beginning on Day 2 of the stress paradigm and ending on the final day of the stress paradigm (i.e., Day 31). Beginning on Day 32, rats were again given access to either ethanol or water for 21 days, as per the methods described above. The results showed that, in this paradigm, stressed rats consumed significantly more ethanol than control rats following the chronic stress manipulation. Moreover, chronic prophylactic fluoxetine treatment was ineffective at preventing the increased ethanol consumption observed in stressed rats. These findings support the notion that our previous observation of reduced ethanol intake in chronically stressed rats was attributable to neophobic behavior. They also suggest that our model of PTSD may be used to further examine the neurobiological mechanisms associated with stress-induced changes in ethanol consumption.

“Glyphosate-Induced Phosphate Desorption in the Maumee River Watershed”

Poster 22, 10-11 a.m., Activities Room

Presenters: Sofie Elisabeth M. Moeller (Dublin, OH); Emily Richards (Delaware, OH)

Research Advisor: Christopher Spiese (Chemistry, ONU)

Glyphosate (trade name RoundUp) usage has steadily risen nationwide since the mid-1990's when RoundUp Ready crops first became commercially available. Since then there has been an increase in phosphorus (P) loads entering the Western Basin of Lake Erie. Over the same time period, the western basin has experienced increasing eutrophication, with harmful algal blooms becoming larger and more persistent. Glyphosate is structurally similar to phosphate and can behave similarly, particularly with respect to its surface binding properties. As such, it should be able to displace phosphate from soils to a certain extent. In order to investigate the role of glyphosate in increased dissolved reactive phosphorus (DRP) loads, soil P desorption studies were conducted and the various factors influencing this desorption were examined. By varying the concentration of glyphosate added to 0.5g soil samples (0, 10, 20, 30, 40, 50 ppm) and measuring DRP concentrations spectrophotometrically, the limitations of linear glyphosate adsorption were observed through isotherm construction. Although

this study is ongoing, preliminary data indicates a correlation between the amount of glyphosate present in the soil samples and the DRP available, suggesting that a significant portion of DRP loading could be attributed to desorption by glyphosate.

“History of Prenatal Methamphetamine Exposure Increases Vulnerability to Nicotine Addiction in Adult Male Rats but not Female Rats”

Poster 6, 10-11 a.m., Activities Room

Presenters: Mary K. Evans (West Mansfield, OH); Christina Marengo (Sacramento, CA)

Research Advisors: Manoranjan D'Souza (Pharmacology, ONU); Boyd Rorabaugh (Pharmacology & Cell Biology, ONU); Sarah Seeley (Pharmacy, ONU)

Background: Previous studies have shown that prenatal methamphetamine (MA) exposure can increase sensitivity to the effects of drugs of abuse like MA and morphine. The goal of this study was to assess the effects of prenatal MA exposure on nicotine-induced stimulant and aversive effects in adult male and female rats. Factors that decrease the aversive effects of nicotine can increase addiction to nicotine. **Methods:** The aversive effects of nicotine were assessed using the nicotine-induced conditioned taste aversion (CTA) model (0.4 mg/kg, base) in adult male and female rats with a history of prenatal MA exposure. After completion of the nicotine-induced CTA experiment, stimulant effects of nicotine (0, 0.1 & 0.4 mg/kg, base) were measured by assessing nicotine-induced changes in spontaneous locomotor activity. **Results:** We found that prenatal MA exposure significantly decreased the aversive effects of nicotine in male rats, but not female rats compared to respective saline controls. Interestingly, no influence of prenatal MA exposure was observed on nicotine-induced increase in locomotor activity in either male or female rats. **Conclusion:** These data suggest that males compared to females with a history of prenatal MA exposure may be more vulnerable to nicotine addiction due to decreased sensitivity to nicotine-induced aversive effects.

“Household Food Insecurity and Nutrition: An Analysis of Rural Western Ohio Communities”

Poster 1, 1:30-2:30 p.m., Activities Room

Presenter: Rachel L. Doty (Alliance, OH)

Research Advisor: Christine North (Communication Arts, ONU)

Food insecurity is the lack of reliable access to an adequate amount of safe, affordable, and nutritious food. This study will analyze the food security and rate of nutritional meal intake of households in Western, Ohio communities in comparison to households in areas of high population. Members of rural Western, Ohio communities will be asked to complete surveys consisting of Likert Scale and yes/no questions. Surveys will then be analyzed to determine the characteristics of households within the following ranges of food security: High Food Security, Marginal Food Security, Low Food Security, and Very Low Food Security. Households in the ranges of Low Food Security and Very Low Food Security will be further analyzed to determine the rate of consumption of balanced meals. After analysis, research will be compared to existing data from households in areas of high population. Following survey collection, participants will be consulted on nutrition through the use of a nutritious cookbook. Results are pending, as this study will be completed in April 2017.

“Impact of Methamphetamine on the Ischemic Heart in Adult Rats”

Poster 11, 10-11 a.m., Activities Room

Presenters: Sarah Hebble (Dublin, OH); Thorne Stoops (South Solon, OH)

Research Advisor: Boyd Rorabaugh (Pharmacology & Cell Biology, ONU)

We previously reported that prenatal exposure to methamphetamine causes female rats to develop myocardial hypersensitivity to ischemic injury when they become adults. However, it is unknown whether hypersensitivity to ischemia develops when rats are exposed to

methamphetamine during adulthood. Adult male and female rats received daily injections of methamphetamine (5 mg/kg) or saline for 10 days. Hearts were mounted on a Langendorff isolated heart apparatus on day 11 and subjected to an ischemic insult. Hearts from methamphetamine-treated female rats exhibited significantly larger infarcts and significantly suppressed postischemic recovery of contractile function compared to saline-treated females. Furthermore, myocardial hypersensitivity to ischemic injury persisted in female rats following 1 month of abstinence from methamphetamine. In contrast, infarct size and postischemic recovery of contractile function were unaffected in hearts from methamphetamine-treated males. This indicates that methamphetamine produces sex-dependent effects on the ischemic heart. These data suggest that women who have heart attacks may be at risk of more extensive myocardial injury if they have a recent history of methamphetamine use.

"Implementing Quiet Time in the Intensive Care Unit"

Poster 12, 11:10 a.m.-12:10 p.m., Activities Room
Presenter: Abbie Nicole Patton (Waynesfield, OH)
Research Advisor: Cynthia Woodfield (Nursing, ONU)

In an intensive care unit (ICU), nurses are taking care of critically ill patients throughout their 12 hour shifts. Implementing quiet time during the day will help improve the nurse's productivity, improve staff awareness of noise in patient care areas, improve patient's sleep/wake patterns, and ultimately improve patient outcomes. A Likert-scale pretest and posttest will be administered to the nurses working in the ICU unit to determine their perceptions of the impact of quiet time on their productivity and assess their knowledge regarding the overall benefits of quiet time in the ICU for patients and staff. Predicted results of the posttest will demonstrate nurses will increase their knowledge of advantages of quiet time and endorse implementing quiet time on the unit. The ICU is a setting where patients require high acuity care. Implementing quiet time will help improve patient outcomes in ICU by increasing nurse productivity, improving staff awareness of noise, and improving patient sleep/wake patterns.

"Improving Rule of Law in Kosovo through Judicial Reforms on Accountability during the Appointment and Reappointment Process of Judges"

Paper 5, 10-11:40 a.m., Room 202
Presenter: Fitore Sadiku (Ferizaj, Kosovo)
Research Advisors: Brian Anderson (Law, ONU); Karen Hall (Law, ONU)

The role of Judicial is very crucial for a country which aims having the existence of the Rule of Law and for a country which promises and aims to provide a just and independent legal environment. Even though Kosovo is a new democracy, with civil law system, it declared its independence in 2008 and it was a great chance, moment, for a good start to build stable and independent institutions, one core of that which it is the judicial institution and within it of an equal of importance is also the appointment and reappointment of the judges. Judicial system in Kosovo is divided in a judicial system- courts, prosecutorial system, and advocacy- bar as an independent institution. Taking in account that Kosovo is a new state, chances were to create from the beginning an independent judicial system- specifically when it comes to the appointment and reappointment of the judges, which is a very important part of creating an independent and a well functional legal environment. However, the reality shows the different situation. There do exist lack of accountability, transparency, political interference, during the process of appointment and reappointment of the judges. Through this research paper, it has been recommended that the appointment and reappointment to be on the merit based, selection with open voting and based on the scoring in the interview, written justification for approval and refusal of a candidate, approval and refusal of a candidate should be made public and appointment and reappointment process to be free from external influences.

"Improving the Accuracy of GPS Localization by Using V2V and V2I Communication"

Poster 16, 12:20-1:20 p.m., Activities Room
Presenter: Kylee Marie Tressler (Defiance, OH)
Research Advisor: Heath LeBlanc (Electrical & Computer Engineering, ONU)

Throughout this semester, we have explored the ongoing research topic of improving the accuracy of GPS localization by using vehicle-to-vehicle (V2V) and vehicle-to-infrastructure (V2I) communication. This research is a work in progress that builds on the work of the cooperative localization capstone. To validate the theoretical foundation of the localization approach, an experimental platform involving remote control (RC) cars, Arduino microcontrollers, XBee, communication modules, and GPS receivers has been implemented by the capstone group. The initial tests have been completed using stationary nodes, which allowed for an easy comparison to the ground truth (involving a set of stakes placed in the fields north of the wind turbines that have been localized by a surveying contractor). However, mobile nodes are much harder to compare to the ground truth while being more like a moving vehicle. Finding the position of an RC car as it moves away from one of the stakes makes it much harder to maintain ground truth in the position of the vehicle. Therefore, the underlying research question is how to maintain ground truth about exact position and exact time with mobility of the RC car?

"Investigation of Whole-Limb Motion as a Primary Motor Goal during Gait"

Poster 18, 12:20-1:20 p.m., Activities Room
Presenters: John D. Rasch (Bellbrook, OH); Amanda Rhoad (Lima, OH)
Research Advisor: Louis DiBerardino (Mechanical Engineering, ONU)
Human gait is critical in daily locomotion and the study of it can yield greater understanding of injury recovery mechanics to restore individuals to normal daily function. One aspect of gait that is commonly studied is leg kinematics. This can be accomplished through the use of three-dimensional motion capture systems to determine the joint and whole-limb angles through a single gait cycle. A previous study conducted on a treadmill demonstrated that cycle-to-cycle variability was much lower for an individual's whole-limb angle than for their joint angles [1]. While some studies have shown that sagittal-plane kinematics are similar between over-ground and treadmill walking [3], others suggest that walking on a treadmill reduces the variability in individual joint angles, especially the ankle [4]. Thus, the goal of the current study is to determine if maintaining whole-limb angle is a primary goal of over-ground gait. Subjects equipped with markers to record the positions of the sacrum and bilateral ASIS, knee, ankle, heel, and toe, were asked to walk through a capture volume of about 10 feet multiple times under various cadences. Once complete (prior to presentation), the current study should be able to determine if whole-limb motion is truly a primary motor goal during gait, or if constraints imposed by the treadmill were the cause of low whole-limb variability in the previous study.

"Kappa Opioid Receptors and Aversive Effects of Nicotine"

Poster 8, 10-11 a.m., Activities Room
Presenters: Melissa A. Ward (Columbus, OH); Haval Norman (Pendleton, OR)
Research Advisor: Manoranjan D'Souza (Pharmacology, ONU)

Objectives: To assess the role of kappa opioid receptors (KORs) in the aversive effects of nicotine. **Methods:** Nicotine-induced aversive effects were measured using the conditioned taste aversion model, which utilizes two unsweetened flavored solutions (e.g. grape and cherry) and a conditioning procedure with nicotine [0.4 mg/kg, base; subcutaneous (s.c.)] and saline. Wistar rats were pretreated with either a KOR agonist \pm U50488 (0, 0.03, 0.3 mg/kg; s.c.) or antagonist norBNI (0, 15, 30 mg/kg; s.c.) prior to conditioning with nicotine. The role of the KORs in expression of nicotine-induced CTA was also assessed by administering norBNI (30 mg/kg, s.c.) after conditioning with nicotine and saline. Changes in preference for the

nicotine-associated flavored solution was used as an index of nicotine-induced aversive effects. **Results:** Pretreatment with the KOR agonist (0.3 mg/kg, s.c.) increased the aversive effects of nicotine. Further, blockade of the KORs using norBNI (30 mg/kg, s.c.) prior to conditioning attenuated nicotine-induced aversive effects. Importantly, administration of the KOR antagonist (30 mg/kg; s.c.) after conditioning with nicotine did not affect nicotine-induced conditioned taste aversion. **Conclusions:** Taken together, these data suggest that KORs can be used to promote smoking cessation by increasing the aversive effects of nicotine.

“Lead (II) Detection Utilizing Highly Fluorescent Sulfonamido-Chromone Derivatives”

Poster 21, 10-11 a.m., Activities Room

Presenters: Megan Renee Nieszala (Lambertville, MI); Jonathan Gregory Szczerba (Mount Victory, OH)

Research Advisor: Jake Zimmerman (Chemistry, ONU)

Our research group is developing a new class of fluorophores utilizing an inverse-demand hetero-Diels-Alder reaction with silyl enol ethers and substituted 3-formylchromones. These compounds yield blue to green fluorescence with quantum yields up to 86% and Stokes shifts up to 143 nm (7003 cm⁻¹). The synthetic scheme is concise and the overall yields are good to excellent. This new class of fluorophores also show great capability as chemical sensors. In particular, they are excellent at detecting lead (II) in an array of solvent systems. More recently, it has been discovered that these sulfonamido-chromones can detect low ppb and nmol of lead (II) in THF:MeOH in addition to deionized water and tap water. Analysis via fluorimetry testing concludes a shift in emission wavelength from blue to green. This has also been studied visually, with the lowest detection limit around 2 nmol. We have also examined how other cations found in water could affect a shift in wavelength as lead (II) is not solely present in tap water. With recent outbreaks involving lead contamination in water, there is a high demand for finding a way to detect lead (II) in water around the EPA limit. Our sulfonamido-chromone is a promising solution to this ongoing problem.

“Legally Blonde or Legal Bluff: An Investigation of Gender Equality within the Legal Profession”

Paper 1, 10-11:40 a.m., Room 202

Presenter: Margaret Elizabeth Kimmel (Kenton, OH)

Research Advisors: Robert Waters (History, ONU); Samantha Howe (Political Science, ONU)

In the popular film *Legally Blonde*, Elle Woods is a scorned sorority girl characterized by her ditz personality and blonde hair. She seeks revenge on her exboyfriend by following him to Harvard law school to win back his affection, but faces a great number of obstacles. Stereotypes and barriers threaten to prevent her from becoming a lawyer, and I plan to investigate if females aiming to become a part of the legal profession in today's society face the same problems. The importance of studying this topic is to find out if women in the legal profession feel they are victim to these prejudices, and if so explore what could be presented as a solution. There has been research done on the existence of gender inequality in general, but not much attention has been paid to the legal profession specifically. For this reason, I think that it is important to look at if the stereotypes that are asserted by pop culture (specifically, *Legally Blonde*) hold true to the realities women face in the legal profession.

“Male Collegiate Athletes' Reaction Time Associated with Repeated Assessment of a Yardstick Test”

Poster 1, 12:20-1:20 p.m., Activities Room

Presenters: Santana Matthew Villarreal (Defiance, OH); Rob Ray Cremeans (Amanda, OH)

Research Advisor: Kurt Wilson (Athletic Training, ONU)

Context: In previous studies, reaction time has seen improvements with the use of yardstick testing. Previous findings have provided information on the test to allow research for possible reduced risks of injury and return to play protocols. **Objective:** To improve reaction in

order to aid in injury prevention, as well as concussion return to play protocols. **Design:** A minimal-no risk, controlled intervention trial study. **Setting:** Athletic Training Clinical Room. **Patients or Other Participants:** Male collegiate athletes that are currently attending Ohio Northern University and participate in Basketball, Wrestling, and Lacrosse. The study consists of volunteers, who are sorted and placed, randomly. The study requires athletes between the ages of eighteen and twenty-three. **Interventions:** Control and practice groups are independent variables. Participants will complete ten trials on a total of ten separate days. Trials will be in-person administration. Each trial consists of ruler-drops from a PVC Pipe and recordings. **Main Outcome Measures:** Reaction time is the dependent variable. This will be manipulated by the measurements being plugged into our formula. The data will then be compared to baseline and so on trials. **Results:** A t-test statistical analysis will be completed to evaluate the data with a significance of $p < 0.05$.

“Manufacturing Robotic Work Cell”

Poster 11, 12:20-1:20 p.m., Activities Room

Presenters: Scott T. Rapps (Bay Village, OH); Nathan C. Kaszej (Brook Park, OH); Leslie B. Somsak (Ashland, OH); Akira Aiba (Naha-City, Okinawa, Japan); Jacob W. Lochard (Sidney, OH)

Research Advisors: Paul Nutter (Manufacturing Technology, ONU); Steve Fisher (Technology, ONU)

Our task was to go from an initial concept to a finished automated work cell. Our work cell is a manufacturing robotic work cell. This system integrates four separate programmable devices (robot, HMI, PLC, and CNC) and makes them work together to perform a task. The task it will perform is to use a HMI (human machine interface) to instruct the robot to pick up a piece of aluminum stock, place it in a CNC mill to be formed in a bottle opener, taken out of the CNC mill and pneumatically install a jump ring, and then finally deliver the product to a finished box.

“Music Composition for *Lysistrata*”

Poster 3, 1:30-2:30 p.m., Activities Room

Presenter: Stephen Coakley (Leesburg, VA)

Research Advisors: Joan Robbins (Theatre Arts, ONU); David Kosmyrna (Music, ONU)

This past fall I was given the unforgettable opportunity to compose for and music direct the Department of Theatre Arts' production of *Lysistrata*, an endeavor that has proven to be the most valuable piece of artistic training I have received at Ohio Northern University thus far. My research began immediately after I found out I would be joining the project. This meant reading multiple translations of the text and truly understanding the meaning of the play and why we were producing it. Our rendition was a contemporary take on a tale that is over 2000 years old and was meant to parallel the extremely divided electorate our country was experiencing at the time. In its presentation, it emulated the sketch comedy of Saturday Night Live and fused elements of the ancient Greek theatre and modern day society. My presentation for the colloquium will include poster summaries of my research, composition process, and work as musical director for the show, as well as video of the songs as they were performed and staged in the production.

“Novel Efficacious Treatment of Melanoma with an Over-the-Counter Drug Agent”

Poster 12, 10-11 a.m., Activities Room

Presenters: Steven D. Blake (Ravenna, OH); Christopher M. Tweed (Cuyahoga Falls, OH); Shelby G. McKamey (Arlington, OH)

Research Advisor: David Koh (Pharmacology, ONU)

Problems with the treatment of melanoma, the most aggressive form of skin cancer, include the excessive prices of anti-melanoma biological agents or the failure to eradicate drug-resistant tumors. Here, we utilized the over-the-counter (OTC) agent, clotrimazole, to treat several lines of human melanoma cells, including those known to be drug-resistant. Clotrimazole caused decreased proliferation and increased cell death in melanoma lines, as compared to

noncancerous human skin cell lines. These results indicate that clotrimazole selectively induces cytotoxicity in melanoma. As clotrimazole is known to inhibit various transient receptor potential (TRP) ion channels, we pretreated these melanoma lines with TRP inhibitors or RNAi. Inhibitors of TRPM8 or TRPV1 failed to produce comparable levels of cell death caused by clotrimazole. However, TRPM2 RNAi silencing caused significant levels of cell death in all melanoma lines. These results indicated that TRPM2 may have a primary role in the ability to treat melanoma. In conclusion, we demonstrated that clotrimazole selectively increases cell death in melanoma cells, with minimal deleterious effects in normal skin cells. We therefore conclude that clotrimazole has in vitro efficacy toward melanoma. These preliminary studies thus indicate that this inexpensive OTC drug has the potential to treat melanoma in the future.

“NS3 Network Simulation to Validate a Periodic Discrete-Time Localization Algorithm in Vehicular Networks”

Poster 15, 12:20-1:20 p.m., Activities Room

Presenter: Edgar E. Gomez (Almont, MI)

Research Advisors: Heath LeBlanc (Electrical & Computer Engineering, ONU); Firas Hassan (Electrical & Computer Engineering, ONU)

In this work, the network simulator NS3 has been used to simulate a Vehicular Ad-hoc Network (VANET) using Dedicated Short-Range Communication in order to validate a novel GPS-augmented localization algorithm. The simulations use IEEE 802.11p, which implements Carrier Sense Multiple Access with Collision Avoidance (CSMA/CA) at the MAC layer. Instead of the standard binary exponential backoff of CSMA/CA, a truncated binary exponential backoff is designed to drop outdated packets. Due to the high-speed vehicular environment, no acknowledgments are used in data transmission. The NS3 constant velocity mobility model is used to enable motion of the vehicles. The localization algorithm requires each node to broadcast one packet each time step of 100ms (the sampling interval of the GPS receiver). NS3 generates an output file containing all successful communication events during the simulation. This file is imported into Matlab in order to simulate the localization algorithm. The results demonstrate the success of the localization approach, where, over 1000 simulation runs, the mean localization error of vehicles is approximately 0.91m with an average standard deviation of 0.48m (compared to an average localization error of 15m without this approach). An illustrative simulation run along with the simulation results are presented in the poster.

“Nurse Perception of Patient’s Understanding of Medications and Educational Tools Used”

Poster 3, 11:10 a.m.-12:10 p.m., Activities Room

Presenter: Joanna E. Messerly (Lancaster, OH)

Research Advisor: Cynthia Woodfield (Nursing, ONU)

Nurses play an important role in how well a patient understands their prescribed medications. This quality improvement project will examine how nurses perceive and educate their patients about their prescribed medications. A pre-test/post-test survey design will be used to gather data about current educational practices used by the nurses on a medical surgical floor at Blanchard Valley Hospital. The survey results will guide the development of an evidence based educational intervention highlighting best practice regarding patient educational intervention which will be shared with the nursing staff. The predicted outcome will be an increase in the knowledge the nurses perceive in their patients regarding understanding of their patient’s medications.

“Nurses’ Perceptions on Effective Pediatric Patient and Family Education”

Poster 19, 11:10 a.m.-12:10 p.m., Activities Room

Presenter: Hailee Robson (Findlay, OH)

Research Advisor: Cynthia Woodfield (Nursing, ONU)

Effective education by nurses can prevent further health issues for a patient and can provide patients insight regarding managing a disease while maintaining a high quality life. Patient education is especially important when caring for the pediatric population. The purpose of this quality improvement project is to determine the nurse’s perception of effectiveness of educational material throughout a hospital stay on the pediatric patient population and their families. An anonymous pretest Likert survey will be administered to registered nurses on a general pediatric unit to determine the nurses’ perceptions of the effectiveness of using educational materials at discharge. Guided by the pretest survey results, a small printed educational intervention will be bundled with a small gift upon admission to each pediatric patient’s family. A posttest Likert survey will then be administered to the registered nurses, exploring their perception on how effective the small educational piece was at improving family knowledge and if the patient and his or her family benefitted from having the material since admission compared to discharge. The goal is to use registered nurses’ perceptions from this project to determine the most effective educational method for the pediatric patient population and their families.

“Nurses’ Perceptions of the Open Visitation Policy in an Intensive Care Unit”

Poster 23, 11:10 a.m.-12:10 p.m., Activities Room

Presenter: Cara Elizabeth Walden (Cincinnati, OH)

Research Advisors: Cynthia Woodfield (Nursing, ONU); Megan Lieb (Nursing, ONU)

Within larger hospitals’ intensive care units (ICU), an open visitation policy has been found to increase patient satisfaction, as well as improve patient outcomes. While unrestricted visiting time with loved ones can be immensely beneficial for patients and families, nurses caring for patients on these floors may experience symptoms of burnout by the questions, concerns, and constant presence of family members at the bedside. Using a Likert type survey, staff nurses in the ICU will be assessed for burnout symptoms and their perceptions of how the open visitation policy impacts patients. Results are predicted to portray a correlation between symptoms of nurse burnout and unrestricted visiting hours. This may result in a modified open visitation policy and staff education aimed at helping nurses successfully manage the care of patients during unrestricted visiting hours.

“One Giant Leap: The Moon as Lyric Poetry”

Paper 3, 10-11 a.m., Deans’ Heritage Room

Presenter: Kasy Jo Long (Terre Haute, IN)

Research Advisor: Douglas Dowland (English, ONU)

“One Giant Leap: The Moon as Lyric Poetry” is a critical analysis of Mary Ruefle’s essay, “Poetry and the Moon.” In her essay, Ruefle explores the relationship between the lyric poetry genre and the moon. My critical analysis expands on Ruefle’s ideas, documenting the history of the lyric poem and discussing when the topical shift regarding the moon began to change during the 1960s--changing from writing about the moon’s image to writing about one’s perspective of Earth from the moon. This critical analysis showcases the lyric poem and explores a different approach to the genre. I presented this paper at the 2017 Sigma Tau Delta International Convention in Louisville, Kentucky.

“Pain Management: Zero Pain is Not the Goal”

Poster 18, 11:10 a.m.-12:10 p.m., Activities Room

Presenter: Shelby R. Goldsmith (Bellefontaine, OH)

Research Advisors: Cynthia Woodfield (Nursing, ONU); Megan Lieb (Nursing, ONU)

Introduction: Pain goals are important for each patient because they help to create a mutually defined realistic goal for pain that is considered tolerable for the patient. **Purpose:** The aim of this study is to gauge the effectiveness of pain goals, whether they are being used accurately, and how they affect patient outcomes. **Methods:** A

pretest Likert survey assessing nurses' knowledge of pain management and the use of pain goals will be administered to the nursing staff on an Oncology unit. An educational intervention will also be shared with the staff to explain pain goals and how they benefit patients. After the follow-up educational intervention, a posttest will be administered to the participants to reassess knowledge. **Results:** It is expected the results will initially indicate the nurses' knowledge of pain goals is limited and based on individual interpretations. Predicted results will show the educational intervention will improve nurses' understanding of effectively managing pain in the acutely ill patient. **Implications for Nursing:** Patients need to be taught that acute and chronic pain will not likely reach a zero, but nurses managing patients in pain can work with each individual to achieve a pain goal that is tolerable and realistic.

"Patient Demographic Influences on Ohio Medicare Beneficiary Influenza Vaccination Rates"

HONR 3, 11:30 a.m.-1 p.m., Bear Cave

Presenter: Sean Bennett (Richfield, OH)

Research Advisor: Jessica Hinson (Pharmacy Practice, ONU)

Background. During the 2015-2016 Flu season, only 49.71% of Ohio Medicare beneficiaries received their annual influenza vaccination. This result is well below the healthy people 2020 goal of 90% coverage. The purpose of this study was to attempt to identify key demographic characteristics influencing Ohio Medicare vaccination rates. **Methods.** Vaccination rates and demographic data were obtained from publicly available data bases and US census results. Statistical analysis was completed using Microsoft Excel regression analysis. Demographic information analyzed includes income, poverty rates, ethnicity, education, physician contact, public health spending, gender, and population density. **Results.** Every demographic influence examined had a statistically significant ($p < 0.05$) influence on rates apart from gender ($p = 0.63$). Income and poverty had the strongest relationships to vaccination rates ($R^2 = 0.41$; 0.34) followed by percentage with greater than high school degree ($R^2 = 0.28$). Public health spending had a negative impact on rates ($p < 0.05$). Ethnicity, physician contact, and population density all had weak but statistically significant influences ($p < 0.05$). **Discussion.** Income, poverty rates, and level of education had the largest effects on vaccination rates out of all demographic features analyzed. Programs that increase the accessibility and affordability of vaccinations may have the largest influence on vaccination rates.

"Performance Characteristics of Variable Activation Function Neural Networks"

Poster 13, 12:20-1:20 p.m., Activities Room

Presenter: Derek Michael Smith (Massillon, OH)

Research Advisor: Heath LeBlanc (Electrical & Computer Engineering, ONU)

Greater use of nature-inspired software can result in better solutions to intractable problems and more capable and optimized software. Neural Networks, conceived by Natural Selection, are an area of opportunity for this paradigm shift. Theoretically, the back-end of entire software could be "bred" in a neural network, and continuously if not autonomously improved by these digital approximations of natural brains. However, such use cases require extensive resources as complexity increases during creation and run-time. An unexplored method for mitigating this problem is variable activation functions as opposed to a single, fixed function across an entire neural network. Two Java applications will be developed: one with a fixed function, and another that varies the functions on a per-node basis. They would use Genetic Programming - the digital approximation of Natural Selection - in order to breed network populations to model sample functions such as clustering and categorization. Their compute times, starting sizes, converged sizes, and performance traits will be examined. It is expected that variable-function networks will take longer to converge upon a solution, but be capable of finding a solution in a smaller network than their fixed-function counterparts. This difference, if scaled, could permit greater functionality with less computational resources.

"Perspectives of ICU Nurses on e-ICU Technology"

Poster 22, 11:10 a.m.-12:10 p.m., Activities Room

Presenter: Amber R. Paul (New Bremen, OH)

Research Advisors: Cynthia Woodfield (Nursing, ONU); Megan Lieb (Nursing, ONU)

Electronic intensive care unit (e-ICU) is a new form of health information technology that allows rural hospitals access to intensivist care and critical care resources. The e-ICU program is a partnership between Premier Health and Advanced ICU Care, the largest e-ICU provider in the United States. This form of 24 hour care delivery is expected to improve evidence-based practice, decrease cost, and offer a collaborative work environment for intensivists and critical care staff. The purpose of this quality improvement project regarding care delivered electronically is to assess ICU nurses' perspectives before and after implementation of e-ICU technology. A Likert scale pre- and post-questionnaire was administered to 21 nurses in the ICU. Additional data was collected on how many times nurses paged the internist before and after e-ICU implementation. 12 surveys were returned and revealed nurses were more comfortable and satisfied with the assistance of e-ICU when the internist was away from the unit. Nurses did not page the internist as often due to the continuation of care from the e-ICU. Positive patient outcomes and efficient communication were noted.

"Pharmacist and Student Pharmacist Perspectives on Providing Preconception Care"

Paper 3, 12:40-1:40 p.m., Deans' Heritage Room

Presenter: Rana Najjar (Windsor, Ontario, Canada)

Research Advisor: Natalie DiPietro Mager (Pharmacy Practice, ONU)

Background: Pharmacists are well-positioned to provide preconception care, a set of preventative interventions that identify and address biomedical, behavioral, and social risks to a patient's health that may negatively affect a future pregnancy. The objective of this study was to assess pharmacist/student pharmacist interest and resource needs to provide preconception care to patients of childbearing age. **Methods:** Pharmacists/student pharmacists in the U.S. and its territories were recruited via a Facebook advertisement to participate in an online survey assessing current practices, interest, and comfort in providing preconception care services; resource needs; and demographics. A small incentive was offered. The study was IRB-approved. **Results:** Three hundred thirty-two responses received from all regions of the U.S. and Puerto Rico. Seventy-two percent of respondents were female; 65% were pharmacists. Respondents reported providing preconception care services and expressed interest in developing new preconception care services. Respondents indicated tools that would facilitate development and provision of preconception care services. **Conclusion:** There are no known studies that explore preconception care comprehensively among pharmacists/student pharmacists on a national level. This study provides insight on the extent of experiences, interest, and comfort pharmacists/student pharmacists have in providing preconception care and identifies training and resource needs for providing such care.

"Prenatal Methamphetamine Exposure Increases Blood Pressure and Impairs Endothelial Function in Adult Male Offspring"

Poster 9, 10-11 a.m., Activities Room

Presenter: Allie M. Harrison (St. Clairsville, OH)

Research Advisors: Sophocles Chrissobolis (Pharmacology, ONU); Boyd Rorabaugh (Pharmacology & Cell Biology, ONU); Sarah Seeley (Pharmacy, ONU)

Hypertension and endothelial dysfunction are commonly associated with cardiovascular disease. Methamphetamine is a widespread societal problem, and methamphetamine use during pregnancy can have deleterious developmental and behavioral consequences for offspring. However, very little data exists on the cardiovascular consequences of prenatal methamphetamine exposure in adult offspring. The aims of this study were to test whether prenatal methamphetamine exposure increases blood pressure and impairs

endothelial function in adult offspring, and whether this is influenced by gender. Pregnant female Sprague Dawley rats (8 weeks old) were treated with either saline or methamphetamine (5 mg/kg/d subcutaneously, once daily) from gestational day 1 until pups were born. Systolic blood pressure (SBP) and endothelial function were assessed in 8 week old adult offspring. In male offspring prenatally exposed to methamphetamine, SBP was increased and endothelium-dependent relaxation responses in second-order mesenteric resistance arteries were selectively impaired when compared to offspring prenatally exposed to saline. Prenatal methamphetamine exposure had no effect on SBP or endothelium-dependent relaxation responses in females. These data suggest that prenatal exposure to methamphetamine increases blood pressure and causes endothelial dysfunction in adult male offspring, whereas female offspring are protected from these effects. Prenatal methamphetamine exposure may increase risk of cardiovascular disease in males.

“Prevention of Central-Line Associated Bloodstream Infections through Mandatory Aseptic Protocol”

Poster 10, 11:10 a.m.-12:10 p.m., Activities Room
Presenter: Allison Riley Gast (Grandville, MI)
Research Advisors: Megan Lieb (Nursing, ONU); Cynthia Woodfield (Nursing, ONU)

Central Line Associated Bloodstream Infections (CLABSI's) are prevalent in healthcare today. Billions of dollars are spent each year treating Hospital Acquired Infections, many of which can be prevented by following protocol. For this quality improvement project, evidence based practice will be explored regarding the importance of aseptic technique and central line management leading to decreased prevalence of CLABSI's. A pretest/post-test Likert scale survey will explore nurse's knowledge related to prevention of CLABSI's, will be given to nurses at Kindred Hospital, Lima OH. Guided by the results of the pretest, educational materials will be developed and presented to unit nurses. A posttest will be given and data will be analyzed and identify nurses knowledge obtained from the educational session. The predicted conclusion is there will be an increase in confidence and understanding of the correct protocol regarding aseptic-technique while dealing with central lines.

“Propranolol Is Ineffective at Blocking the Cardiovascular Consequences of a Predator-Based Psychosocial Stress Model of PTSD”

Poster 4, 10-11 a.m., Activities Room
Presenters: Brooke Kohls (Clarksville, OH); Robert Rose (Newark, OH); Thorne Stoops (South Solon, OH); Megan Heikkila (Shaker Heights, OH); Brooke J. Hertenstein (Troy, OH); Kiera Robinson (Findlay, OH); Kasey Mucher (Arlington, TX); Madelaine Huntley (Ada, OH); Paul D'Alessio (Ada, OH)
Research Advisors: Phillip Zaladz (Psychology, ONU); Boyd Rorabaugh (Pharmacology & Cell Biology, ONU)

Individuals with PTSD are at increased risk for cardiovascular disease. We previously reported that a predator-based psychosocial stress model of PTSD led to greater myocardial sensitivity to ischemic injury. Here, we examined whether chronic administration of the β -receptor antagonist propranolol would prevent such effects. Male Sprague-Dawley rats were exposed to psychosocial stress or control conditions for 31 days. Stressed rats were given two cat exposures, separated by 10 days, and subjected to daily social instability throughout the paradigm. Control rats were handled daily. Beginning on Day 2, half of the stressed rats and half of the controls rats were given 0.5 g/l propranolol in their drinking water, which continued until the end of the experiment. Rats were tested for anxiety-like behavior on the elevated plus maze (EPM) on Day 32, and on Day 33, rat hearts were isolated and subjected to 20 min ischemia and 2 hr reperfusion on a Langendorff isolated heart system. Stressed rats, regardless of treatment condition, exhibited heightened anxiety on the EPM, as well as larger myocardial infarcts following ischemia. These findings suggest that the increased myocardial sensitivity to

ischemic injury observed in psychosocially stressed rats is not dependent on β -receptor activity.

“Quantum Control”

Poster 17, 12:20-1:20 p.m., Activities Room
Presenter: Bryan P. Peck (Westerville, OH)
Research Advisor: Heath LeBlanc (Electrical & Computer Engineering, ONU)

Thermostats, toasters, washing machines, and many consumer products are regulated with control theory to automate their tasks. However, classical control theory, which involves taking measurements of relevant quantities in order to correct deviations from the desired behavior, does not transfer directly to quantum systems. This is because quantum systems are inherently affected by the action of taking a measurement through Heisenberg's Uncertainty Principle. While open-loop quantum control, which avoids taking measurements, is similar to classical control, closed-loop quantum control is very different because of the noise created in the system through the measurement process. Approaches that are currently being refined for closed-loop quantum control include closed-loop learning control, direct feedback control, indirect feedback control, quantum filtering, and coherent quantum feedback. These methods provide ways to control some quantum systems while more methods and alterations are being created to work on other types of systems. Quantum control hopes to provide ways of controlling all types of quantum systems through certain combinations of new and old strategies. This work surveys the current state of quantum control and the progress made to this point.

“Ready or Not: Evaluating Disaster Preparedness Systems at Ohio Northern University from a Public Health Perspective”

Paper 1, 11:50 a.m.-1:30 p.m., Room 202
Presenter: Michaela Renee Walker (Columbus, IN)
Research Advisors: Christine North (Communication Arts, ONU); Karen Kier (Clinical Pharmacy, ONU)

To uphold and demonstrate their pledge to student and employee health, universities must provide environments that are safe and conducive to learning and exploration. They remain aware of increasing campus violence and disaster potential and face the challenge of preparing for the worst, should it happen. It becomes necessary for universities to review and understand the risk factors and threats that are unique to their physical location and institution type. In this project, I evaluate current literature to identify unique risks and challenges associated with small campus settings as well as determine the current gold standard for disaster preparedness. Through a series of interviews I evaluate emergency preparedness systems at Ohio Northern University, compare our current practice to the gold standard for university preparedness, and provide recommendations for further policy development based on my findings and discuss the impact they have on student and employee health.

“Recognizing and Preventing Burnout in Float Pool Nursing”

Poster 21, 11:10 a.m.-12:10 p.m., Activities Room
Presenter: Hannah L. Milstead (Canfield, OH)
Research Advisors: Megan Lieb (Nursing, ONU); Tara Stone (University Hospitals Rainbow Babies and Children's Hospital)

The current nursing shortage recognizes nursing burnout as a major contributor to decreased staff retention. Recognizing and preventing nurse burnout is key to staff satisfaction, which will provide positive patient outcomes and satisfaction. A pretest/posttest, Likert-scale survey design will be used in this quality improvement project and will be administered to nurses working in the float pool at an acute care hospital. The pretest survey will identify if float pool staff can effectively recognize symptoms and contributing factors of nurse burnout. An educational intervention will be developed from the survey results and administered to the float pool nurses addressing causes of burnout, recognition of nurse burnout, and prevention of burnout in nursing staff. A post intervention survey will be

administered to the float pool staff to determine their ability to recognize symptoms of burnout and understand how to prevent burnout among nurses. It is expected the results will indicate many nurses in the float pool are experiencing some degree of burnout. The participants will also be able recognize major contributors to burnout resulting in an increase in ability to recognize and prevent burnout among float nurses.

“Refining the Gas Kinematics in NGC 4552 for Black Hole Mass Determination”

Poster 9, 12:20-1:20 p.m., Activities Room
Presenter: Shota Hodono (Tokushima, Japan)
Research Advisor: Jason Pinkney (Physics, ONU)

The elliptical galaxy NGC 4552 is about 15.6 Mpc away and shows signs of nuclear activity. A supermassive black hole (BH) is surely present, but a secure BH mass is not yet published for this galaxy. A dataset from the Space Telescope Imaging Spectrograph (STIS) shows promise for providing a BH mass using the gas kinematics method. Here we report on the emission line fitting which is a prerequisite for the gas kinematic modelling. We fit gaussians to the lines using chi-squared minimization. For some of the spectral extractions the fitting is problematic because of either noise, non-gaussian line profiles, or a strong blending of narrow lines with broad lines from the active nucleus. We present our final rotation curves which look consistent with a disk of excited gas rotating about a central dark mass.

“Results of a Pharmacy Student-Led Admission Medication Reconciliation Program in Selected High-Risk Patients”

HONR 3, 10-11:30 a.m., Bear Cave
Presenter: Jana Louise Randolph (Decatur, IL)
Research Advisor: Brittany Bates (Pharmacy Practice, ONU)

This project aims to analyze the discrepancies found by pharmacy student-led admission medication reconciliation performed at Lima Memorial Hospital. Students select patients based on high-risk disease states and obtain a home medication list from the selected patients. High-risk disease states include heart failure, myocardial infarction, end stage renal disease, diabetes, hypertension, and chronic obstructive pulmonary disease. Any discrepancies found between the initial home medication list recorded when the patient was first admitted to the hospital and the list obtained by the pharmacy student are documented and corrected in the patient's profile. Based on similar studies, it is predicted that the most common types of errors will be medication omission, incorrect dosage, and incorrect frequency of administration. It is also expected that a longer list of home medications will correlate to a higher rate of errors in the medication list. This project will also investigate which drug classes have a higher rate of errors as well as whether location of admission to the hospital (e.g., emergency department, transfer, direct admission), patient age, patient gender, or reason for admission are correlated to a higher rate of errors in the home medication list.

“RGS2 and Its Role in Modulating Angiotensin-II-Induced Hypertension, Reactive Oxidative Stress Levels, and Emotional Behaviors”

HONR 1, 1-2:30 p.m., Bear Cave
Presenter: Bruce Xu (Medina, OH)
Research Advisor: Sophocles Chrissobolis (Pharmacology, ONU)

Hypertension leads to cardiovascular disease, and can contribute to anxiety and depression. Angiotensin II (ANG-II) increases blood pressure and increases levels of reactive oxygen species (ROS), which are associated with cardiovascular disease. ANG-II signals through G-protein-coupled ANG-II type 1 receptors. Regulator of G-protein signaling 2 (RGS2) is a negative regulator of G-protein coupled receptors, so it is hypothesized that RGS2 can reduce ANG-II-induced hypertension, arterial oxidative stress, and anxiety and depression-related behavior. RGS2 wild-type (RGS2^{+/+}) or RGS2 deficient (RGS2^{-/-}) mice will be treated with osmotic minipumps containing

control (saline) or ANG-II (1mg/kg/d) placed subcutaneously for 21 days. Blood pressure will be measured by tail cuff plethysmography, and ROS measured using chemiluminescence. Depression and anxiety-related behaviors will be measured through tail suspension tests and elevated plus maze tests, respectively. It is predicted that ANG-II-treated RGS2^{-/-} mice will have higher blood pressure, ROS, increased immobilization time within the tail suspension tests and less time spent in the open arms of the elevated plus maze tests compared with Ang-II-treated RGS2^{+/+}. These results will suggest that RGS2 modulates ANG-II-induced hypertension, ROS production, and anxiety and depression-related behaviors. Future medications can be developed to increase RGS2 activity to treat hypertension and other conditions involving ANG-II.

“Rock and Roll and College Campuses in the '70s”

Poster 11, 1:30-2:30 p.m., Activities Room
Presenter: Travis Michael Yammine (Findlay, OH)
Research Advisor: Harry J. Wilson (Management & Geography, ONU)

The purpose of this research is to consider the importance of the relationship between the rock industry and college campus entertainment in the 1970s. Our case study focuses on a concert that occurred at ONU on May 9, 1975, as indicative of this relationship. ONU and regional promoters facilitated this concert, which included performances by KISS, the James Gang and the Flock (filling in for Rush). Our data come from a variety of scholarly and industry sources, and also from interviews of those in attendance. Our research shows that college campuses were very important to artists on the rise to stardom, as well as those falling from popularity. In the case of ONU's concert, featuring Kiss and The James Gang, both were certainly true. The former band was on the verge of international popularity, while the latter was waning. Yet both came together in what proved to be a remarkable and memorable event.

“Role of Regulator of G-Protein Signaling 5 in Modulating Blood Pressure, Cerebral Vascular Oxidative Stress and Emotional Behaviors”

Poster 5, 10-11 a.m., Activities Room
Presenters: Trevor C. Guisinger (Kalida, OH); Haval Norman (Pendleton, OR)
Research Advisors: Manoranjan D'Souza (Pharmacology, ONU); Sophocles Chrissobolis (Pharmacology, ONU); Boyd Rorabaugh (Pharmacology & Cell Biology, ONU); Sarah Seeley (Pharmacy, ONU)

Hypertension is a risk factor for cardiovascular disease, and angiotensin II (Ang II) contributes to hypertension. Regulator of G-protein signaling (RGS) proteins modulate responses to extracellular signals (such as Ang II) acting through G-protein-coupled receptors. RGS5 is expressed in the vasculature and brain. In these experiments, we examined the role of RGS5 in modulating blood pressure, cerebral vascular superoxide levels, and anxiety and depression-related behaviors (which may be associated with hypertension). Male wild-type (RGS5^{+/+}) and RGS5-deficient (RGS5^{-/-}) mice were treated with vehicle (saline) or Ang II (1 mg/kg/d) via osmotic minipumps for 21 days. Systolic blood pressure (SBP), anxiety and depression-related behaviors were assessed in conscious mice; superoxide levels were examined in isolated cerebral vessels. Ang II treatment caused a greater increase in SBP in RGS5^{-/-} compared to RGS5^{+/+} mice, suggesting that RGS5 modulates Ang II-induced blood pressure increases. Vehicle-treated RGS5^{-/-} mice exhibited greater anxiety-related behavior than RGS5^{+/+} mice. Combined RGS5 deficiency and Ang II treatment increased superoxide levels, and there was a trend for an increase in depression-related behavior when compared with Ang II-treated RGS5^{+/+} mice. Overall, the data suggest important roles for RGS5 in modulating Ang II-induced increases in blood pressure, cerebrovascular superoxide and emotional behavior.

“Role of Regulators of G-Protein Signaling RGS2 and RGS4 Proteins in Nicotine-Induced Anxiolytic Behaviors”

Poster 10, 10-11 a.m., Activities Room
Presenters: Lisanne Sprague (Williamsville, NY); Uhood Ashkan (Al Madinah, Saudi Arabia)

Research Advisors: Manoranjan D'Souza (Pharmacology, ONU); Boyd Rorabaugh (Pharmacology & Cell Biology, ONU); Sarah Seeley (Pharmacy, ONU)

Tobacco smoking continues to be a challenge to healthcare providers across the country despite growing awareness of its harmful effects and availability of Food and Drug Administration approved smoking cessation medications. Thus, there is a continuous need to identify novel targets for future smoking cessation medications. Regulators of G-protein signaling (RGS) such as RGS2 and RGS4 negatively regulate the signaling pathway of several neurotransmitters that play a role in nicotine-induced changes in locomotor activity and anxiolytic effects. However, the effects of knocking out RGS2 and RGS4 proteins on the behavioral effects of nicotine are not known. Data analyzed till date suggests that knockout (KO) of the RGS2 and RGS4 proteins has anxiogenic effects in animals. Importantly, nicotine administration induced anxiolytic effects in both RGS2 wildtype (WT) and KO animals. In contrast, nicotine-induced anxiolytic effects were only observed in RGS4 KO and not RGS4 WT animals. Further, the data suggest that RGS4 KO animals were more sensitive to nicotine-induced decrease in locomotor activity compared to their WT counterparts. Overall, the data suggest differential effects of RGS2 and RGS4 proteins in nicotine-induced behaviors.

“Role of Regulators of G-protein Signaling RGS2 and RGS4 Proteins in Nicotine-Induced Behaviors”

HONR 2, 11:30 a.m.-1 p.m., Bear Cave

Presenters: Haval Norman (Pendleton, OR); Lisanne Sprague (Williamsville, NY)

Research Advisors: Manoranjan D'Souza (Pharmacology, ONU); Boyd Rorabaugh (Pharmacology & Cell Biology, ONU); Sarah Seeley (Pharmacy, ONU)

Tobacco smoking rates are higher in individuals suffering from anxiety and/or depression, possibly due to anxiolytic and antidepressant effects of nicotine. However, molecular targets mediating these nicotine-induced effects are not fully known. Regulators of G-protein signaling 2 (RGS2) and 4 (RGS4) negatively regulate intracellular signaling cascades for several neurotransmitters including serotonin and dopamine, which are believed to partially mediate nicotine-induced anxiolytic and antidepressant effects. The focus of our research was to ascertain the impact of RGS2 and RGS4 proteins in the affective effects of nicotine. Nicotine-induced antidepressant properties were measured via the tail suspension model in mice, while the elevated plus-maze was used to assess nicotine-induced anxiolytic effects. We report that the nicotine-induced antidepressant and anxiolytic effects were significantly greater in mice lacking the RGS4 protein compared to their wildtype counterparts. In contrast, mice lacking the RGS2 proteins were less sensitive to nicotine-induced antidepressant effects compared to their wildtype counterparts. Overall, results showed that knockout of the RGS4 protein increased sensitivity to nicotine-induced anxiolytic and antidepressant effects in mice. Future studies will need to assess if polymorphisms in the RGS4 gene make humans more sensitive to nicotine and possibly more vulnerable to nicotine addiction.

“Russia's Annexation of Crimea”

Paper 4, 10-11:40 a.m., Room 202

Presenter: Makiko Kabesu (Tokyo, Japan)

Research Advisors: David McClough (Economics, ONU); Nusta Carranza Ko (Comparative Politics, ONU)

On February 2014, Russia surprised the world by a sudden annexation of Crimea. Why was the annexation carried out in 2014? This paper explores the various causal factors related to Russia's invasion of Crimea. In this case, many of complicated situations are connected to each other. First, the biggest cause stirring up Russia's feeling would be former Ukraine President Viktor Yanukovich's fall by pro-Western Ukrainians. Second, Ukraine's leaning toward the European Union, especially the EU-Ukraine free trade agreement,

encouraged Russia's decision maker Vladimir Putin to invade Crimea for fear of economic damage in Russia. Third, present-day Western countries' weak diplomacies give Russia more confidence in strong behavior. Taken further, the multifaceted exploration gives us a clearer understanding of this complex problem and helps us to have better prediction of what will happen around Russia in the future.

“Safe Patient Handling and Proper Use of Safe Patient Transferring Equipment”

Poster 6, 11:10 a.m.-12:10 p.m., Activities Room

Presenter: Collin G. Bzovi (Wauseon, OH)

Research Advisor: Cynthia Woodfield (Nursing, ONU)

Safe patient handling in healthcare leads to fewer employee injuries and leads to better patient outcomes. In many healthcare facilities, implementing safe patient handling programs have faced challenges. Factors that could affect implantation of safe patient handling programs include inadequate education on both the benefits and equipment used for safe patient handling. In addition, healthcare facilities are busy and time to educate and implement is not always attainable. The purpose of this study is to first assess a group of nurses in an emergency department about their level of comfort using the available safe patient transferring equipment. Furthermore, a pre-survey will identify why these nurses do not use the equipment more and any other obstacles they face for practicing safe patient handling. After the pre-survey, an educational intervention will be provided about proper equipment use and the benefits of safe patient handling. A post-survey will be implemented asking how the perspectives of these nurses have changed regarding safe patient handling. Both the pre-survey and post-survey used a Likert scale to assess the nurses.

“Santa for Seniors: Professional Development during a Pharmacy Student Outreach”

HONR 5, 11:30 a.m.-1 p.m., Bear Cave

Presenter: Isabel E. Cwikla (Norridge, IL)

Research Advisors: Kelly Kroustos (Pharmacy Practice, ONU); Kristen Sobota (Pharmacy Practice, ONU)

Loneliness is a notable risk factor of depression among elderly in community and nursing homes, especially around the holidays. Studies reveal a significant positive relationship between subjective happiness, loneliness, and psychological wellbeing. Santa for Seniors was an outreach developed to foster a relationship between the ONU College of Pharmacy and Vancrest of Ada to help residents combat loneliness, a major predictor of morbidity and mortality in the senior citizen population. ASCP members voluntarily donated Christmas gifts, which were distributed to 46 residents. Upon gift delivery, pharmacy students engaged with residents and developed their professional skills through application of didactic knowledge. IRB approved post-surveys were distributed thereafter and completed by 28 students and 7 Vancrest of Ada employees. Student surveys assessed professional growth and development based on patient interaction and participation in gift purchasing and/or delivery while employee surveys evaluated event success and its impact on residents. Survey results confirm this outreach positively impacted quality of life, improved student awareness of issues affecting elderly residing in assisted living facilities, and provided greater understanding, empathy, and knowledge of alternate strategies to support patient health and wellness initiatives that do not rely on conventional medicine.

“Selections from ‘Halls of Freya’”

Paper 1, 11:10 a.m.-12:30 p.m., Deans' Heritage Room

Presenter: Sofie Elisabeth M. Moeller (Dublin, OH)

Research Advisor: Douglas Dowland (English, ONU)

Written as a senior capstone, "Halls of Freya" is a collection of fifteen poems which seeks to explore biculturalism and interpersonal relations (primarily) through specific use of imagery. More specifically, the collection aims to answer the questions "what happens to a person, when the culture in which they live is not the

same as the one in which they were raised?" and "how does one's cultural landscape influence one's personal narrative?" In addition to answering these questions, the collection also works within the lyric tradition as described by Helen Vendler. Selections from the collection will be read, and accompanied by a brief, critical introduction.

"Simulation as an Effective Training Method for Nurses"

Poster 9, 11:10 a.m.-12:10 p.m., Activities Room
Presenter: Jillian L. Chapman (Sandusky, OH)
Research Advisor: Cynthia Woodfield (Nursing, ONU)

Patient simulation offers medical staff an environment to recreate clinical experiences as close as possible to an actual situation, without putting any patients at risk. The purpose of this study is to expose nurses to an environment that is as close as possible to an actual clinical code blue experience in attempts to increase nurses perceived confidence, skill competence, and openness to simulation training as a new way of competency training. A pretest- post test Likert scale design was used to measure the effectiveness of online simulation as a teaching strategy for medical surgical staff nurses at a rural Ohio hospital. The pretest was administered to determine nurses perceived competence and confidence during a code situation and their perception of simulation implementation as a teaching method. An online educational intervention including a mock code was completed by the participants. A posttest was administered to determine the effectiveness of the simulation on nurses perceived confidence and competence during code simulation. Results indicated that confidence of nurses during a code situation was increased after the mock code simulation. This study provides a foundation supporting the use of simulation as an effective teaching method.

"Small Molecule Affinities for Sirt-1 Deacetylase Enzyme"

Paper 1, 12:40-1:40 p.m., Deans' Heritage Room
Presenter: Martin Brenneman (Forest, OH)
Research Advisor: Tarek Mahfouz (Pharmaceutical Chemistry, ONU)

Cinnamon has been shown to decrease blood glucose levels in type-II diabetics. Analysis of cinnamon extract have determined that it contains a number of polyphenolic compounds and the antidiabetic effect of cinnamon is hypothesized to be due to those phenolic compounds. The protein target of those phenolic compounds has not been identified yet. However, Sirtuin-1 (Sirt-1), a deacetylase in the insulin signaling pathway, seems a likely target. To investigate this possibility, we docked several polyphenolic compounds that are commonly found in cinnamon extract to Sirt-1 in order to determine their binding affinities and compared these to Sirt-1 affinity for resveratrol which is not in cinnamon extract, but it is a known activator of Sirt-1. We used Sirt-1 structure 5BTR for the docking which contained three molecules of resveratrol with a 7-amino-4-methylcoumarin (AMC)-containing peptide in the binding site. Our results indicate a cooperative binding of resveratrol molecules when docked sequentially in the binding site with the AMC peptide. We further hypothesized that the polyphenolic compounds within cinnamon would have a similar effect. To investigate this, a second set of docking simulations was performed on the polyphenolic compounds within cinnamon extract to investigate potentially similar interactions as shown by resveratrol. These docking simulations were done using AutoDock Vina in two different trials; one using sets of three of the same molecule, and the second using sets of combinations of three molecules. Results from those trials showed similar and sometimes stronger interactions than resveratrol between Sirt-1 and the molecules docked. Molecules with affinities at least as strong as resveratrol's were used for sequential docking runs. These results strongly suggest that Sirt-1 is a possible target for cinnamon extract.

"Steak 'n Shake in Ada"

Poster 20, 1:30-2:30 p.m., Activities Room
Presenter: Tyson E. Bolenbaugh (Convoy, OH)
Research Advisor: Harry J. Wilson (Management & Geography, ONU)

The purpose of this study is to assess the viability of building a new Steak 'n Shake restaurant in Ada, Ohio. I chose to do this specific research because I believe Ada is a strong market for a 24-hour restaurant with a menu similar to that of Steak 'n Shake's. My research primarily comes from analyzing local demographic and consumer data utilizing Esri Business Analyst GIS software. I specifically examine the amount of money spent by families at similar fast food restaurants, the number of people ages sixteen to twenty-four, and other data frequently used in similar studies. I also conduct drive-time analysis to the restaurant's proposed location in Ada, and also competitor analysis. I conclude that Ada would benefit from a new Steak 'n Shake and that the restaurant would be successful.

"Synthesis and Catalytic Assessment of Palladium Complexes Bearing Bridging and Pendant Amine Bis(phenolate) Ligands"

Poster 20, 10-11 a.m., Activities Room
Presenters: Eric M. Collins (Strongsville, OH); Brendan J. Graziano (Wickliffe, OH); Nathan C. McCutcheon (Dover, OH); Nicole M. Braunscheidel (Avon, OH)
Research Advisor: Bradley Wile (Chemistry, ONU)

Amine bis(phenolate) based, late-transition metal complexes offer effective cost-effective, phosphine-free air and moisture tolerant alternative as catalysts for cross coupling reactions. A series of amine bis(phenolate) ligands have been isolated and characterized. Complexes formed in situ from Pd(OAc)₂ and a range of amine bis(phenolate) ligands prove to have excellent activity for the Suzuki-Miyaura coupling of aryl bromides and phenylboronic acid at very low catalyst loading (0.01mol%). Comparison of isolated Pd complexes with in situ activity will be reported, and overall trends of steric and electronic variants of amine bis(phenolate) ligands summarized.

"Synthesis of Ligands Bearing Amino Acid Groups via the Mannich Reaction"

Poster 18, 10-11 a.m., Activities Room
Presenters: Cheyanne M. Laux (Maumee, OH); Amanda K. Swanson (Jamestown, NY)
Research Advisor: Amelia Anderson-Wile (Chemistry, ONU)

Over the past decade, interest has grown in the development of organometallic complexes for the polymerization of monomers from renewable resources. Our research targets the polymerization of lactide to Polylactide (PLA) using different metal complexes (Ti, Mo, V, etc) bearing variations of amine bis(phenolate) ligands. Current work focuses on optimizing reaction conditions (base and no base) for these ligands derived from 2,4-dimethyl phenol and a variety of amino acids. In addition, the synthesis of molybdenum complexes bearing the [OONO] ligand is currently underway. The complexes catalytic activity will be investigated in future studies. All ligands and metal complexes will be fully characterized using NMR techniques (¹H, ¹³C, ¹³C DEPT, HSQC, HMBC, COSY), IR, TLC, melting point, and x-ray crystallography.

"Talking It Out: Investigating the Relationship between Verbal Ability and Externalizing Behaviors among College Students"

Poster 6, 1:30-2:30 p.m., Activities Room
Presenters: Taylor Lynn Wohlgamuth (Wapakoneta, OH); Kayla Reuss (Cincinnati, OH); Ryan Holtzman (Miamisburg, OH); Courtney Tinkey (Crestline, OH)
Research Advisor: Ann Johnson (Psychology, ONU)

Past research has found an association between verbal abilities and externalizing behavior; however, this research has predominantly focused on children who have been diagnosed with speech or language disorders and then have developed externalizing disorders, such as antisocial personality disorder or attention-deficit/hyperactivity disorder (ADHD), or engaged in externalizing behaviors (e.g., delinquency) later in life (Beitchman et al., 2001; Brownlie et al., 2004; Ketelaars, Cuperus, Jansonius, & Verhoeven, 2010). Other research has suggested a potential relationship between verbal intelligence and social skill, although the connection

again appeared tenuous in an elementary-age population without co-occurring diagnoses (Monopoli & Kingston, 2012). Thus far, research on the link between these two areas, beyond their association within diagnosed populations, is not well-studied. The current study is interested in what relationships exist between verbal ability and externalizing behaviors within a typically developing young adult sample. We hypothesized that lower verbal intelligence will predict increased externalizing behavior, including increased self-reported alcohol use, increased ADHD symptoms, increased delinquent activity, and poorer emotion regulation within a typically developing college student sample.

“The Accuracy and Validity of iOS-Based Heart Rate Apps during Moderate to High Intensity Exercise”

Poster 4, 12:20-1:20 p.m., Activities Room

Presenters: Alexa M. Bouts (Findlay, OH); Lauren A. Brackman (Tipp City, OH); Elizabeth J. Martin (Buckland, OH); Adam M. Subasic (Raleigh, NC)

Research Advisor: Edward S. Potkanowicz (Exercise Physiology, ONU)

People use smartphones for browsing, communications, and social media. Recently, these smartphones are being used to track fitness metrics, like heart rate. It is unclear whether smartphone apps are an accurate measure of exercise intensity. **Purpose:** To determine the accuracy of two iOS-based heart rate apps when compared to an ECG and Polar® heart rate monitors at moderate to high intensity exercise. **Methods:** Fifteen active male and female college students were recruited. Pre-exercise heart rate and blood pressure were recorded after 10 minutes. Participants then exercised on a stationary bike at a pedal rate of 50-60 rpms. The warm-up stage was 40% of their Age-Estimated Maximal Heart Rate. Exercise intensity then progressed from 50% to 85% of AEHRM in eight 5-minute stages. At the end of each stage heart rates were recorded from the smartphone apps, the Polar® device, and from the ECG. Participants then completed a 5-minute cool down at 40% of their AEHRM. Post-exercise heart rate and blood pressure were also recorded to ensure full recovery to baseline levels. **Results:** Results suggest accuracy at some of the workloads. **Conclusion:** While accurate at a majority of the workloads, the apps can be difficult and somewhat unreliable in real-world use.

“The Art of Losing”

Paper 2, 10-11 a.m., Deans' Heritage Room

Presenter: Kelley A. Lewis (Bellefontaine, OH)

Research Advisors: Douglas Dowland (English, ONU); Jonathan Pitts (English, ONU)

This nonfiction piece explores the stages of grief when losing a person who has been diagnosed with stage 4 colon cancer. Written from the perspective of a daughter, it explores how the stages of grief are displayed in a teenage girl and also their appearance in an actual human experience rather than in a clinical format. It portrays the way that a teenage girl experiences grief and also the connection her grief has to writing creatively and using poetry as a form of grieving.

“The Effect of Music as a Driving Distraction as Measured by Reaction Time”

Poster 6, 12:20-1:20 p.m., Activities Room

Presenters: Keely L. Wagner (Lebanon, OH); Addie M. Davis (Carrollton, OH); Sara D. Landis (Orrville, OH); Habib I. Mohammad (Westlake, OH)

Research Advisors: Vicki Motz (Biological Sciences, ONU); Rema Suniga (Biological Sciences, ONU)

Distracted driving has become an increased traffic hazard in recent years. Distractions while driving cause slower reaction times, and therefore accidents. All cars have radios and 95% of people listen to music while driving. The implications of listening to music while driving is controversial. Familiarity of music and tempo have been linked to both distraction and alteration of heart rate. Participants (N=50)

ages 18-25 completed a computer generated reaction time test while they listened to both familiar and unfamiliar music played at fast and slow tempos and while they sat in silence. In addition, their heart rate was monitored via a pulse transducer. There were no significant differences in reaction times (ANOVA, $F=1.203$, $p=0.308$) or heart rates (ANOVA, $F=0.664$, $p=0.651$) between test situations. However, a trend was observed in which heart rate increased while the participant completed the reaction time test, signifying that the reaction time test caused an increase in mental load. This study was not able to resolve the disparity in the response to familiarity of music.

“The Effects of Disintegrants on the Dissolution Characteristics of Ibuprofen Containing Tablets”

HONR 1, 10-11:30 a.m., Bear Cave

Presenter: Caleb A. VonStein (Shelby, OH)

Research Advisors: Yousif Rojeab (Pharmaceutics, ONU); Deirdre Myers (Pharmacy, ONU)

Tablet formulations consist of active ingredients and inactive ingredients called excipients. An important excipient in these formulations are called disintegrants. Disintegrants are used for the breakup or separation of the tablet's compressed ingredients. This ensures prompt exposure of drug particles to the dissolution process and enhancing drug absorption. This will then decrease the time needed to reach a therapeutic response. The purpose of this study is to assess different disintegrants (microcrystalline cellulose, starch, carboxymethylcellulose, and hypromellose) in a 200 mg ibuprofen tablet as well as different concentrations of each disintegrant compared to a commercially available 200 mg ibuprofen tablet. Samples of each compounded disintegrant in a 200mg ibuprofen tablet will be tested using a USP II dissolution apparatus and the ibuprofen concentration will be measured using high-performance liquid chromatography (HPLC). This will measure the amount of ibuprofen that is released into the test solution over time. We hypothesize that the superdisintegrant, hypromellose, at the highest recommended concentration will cause the tablets to dissolve the quickest of the disintegrants. Thus, this will allow the ibuprofen to complete the dissolution process at a faster rate. Data collection in this project is ongoing and no clear trends have emerged thus far.

“The Effects of Tea and Essential Oil Forms of *Cymbopogon citratus* on Alpha and Beta Brain Wave Activity”

Poster 7, 12:20-1:20 p.m., Activities Room

Presenters: Samson Maxwell Frendo (Findlay, OH); Brooke J. Hertenstein (Troy, OH); Ashley M. Mast (Wooster, OH); Malachi S. Nolletti (Jeromesville, OH)

Research Advisors: Vicki Motz (Biological Sciences, ONU); Rema Suniga (Biological Sciences, ONU)

In recent years, anxiety disorders have become increasingly prevalent. Many people have turned to naturopathic remedies as an alternative to traditional medicine. Traditional anxiolytics decrease beta wave amplitude and increase alpha wave amplitude. This study aimed to validate claims that lemongrass, *Cymbopogon citratus*, has characteristic anxiolytic effects on brain waves, and to determine whether tea or essential oil (EO) was a more effective delivery method. Prefrontal EEG alpha and beta waves were measured in 50 participants aged 18-24 in unstressed, cold stressed, and cold stressed with tea/EO treatments. Large variability was seen in alpha and beta amplitude for all parameters, resulting in no significant differences. Future tests utilizing a non-physical stressor that induces consistent physiologic changes is recommended to more effectively determine anxiolytic effects of this herb.

“The Evolution of the Florida Democratic Party: From Conservative to Liberal”

Paper 2, 10-11:40 a.m., Room 202

Presenter: Daniel R. Warren (Tallahassee, FL)

Research Advisors: Robert Waters (History, ONU); Samantha Howe (Political Science, ONU)

For this paper, I will discuss how the Democratic party in Florida used to be conservative and how it has moved to the liberal side. I will go into detail how conservative Democrats (Southern Democrats) in Florida changed their age-old affiliation with the party, and jumped ship to the Republican party. The methods include looking at voter trends and pulling together sources about Florida politics. By the end of this paper, we will see if the change in the Florida Democratic party was based upon ideological beliefs of the people or was it based on more systematic changes from within the party.

“The Flower Doesn't Dream of The Bee”

Paper 1, 10-11 a.m., Deans' Heritage Room
Presenter: Rachel L. Cruca (Findlay, OH)
Research Advisor: Douglas Dowland (English, ONU)

A short collection of poetry centered around Helen Vendler's definition of the lyric. Part of a capstone project being presented at the Sigma Tau Delta conference in Louisville, Kentucky, this spring.

“The Impact of Writing Style and Time of Testing on Memory”

Poster 8, 1:30-2:30 p.m., Activities Room
Presenters: Mackenzie R. Rigenbach (Convoy, OH); Ilaria M. DiBernardo (Wadsworth, OH); Caitlin C. Nahiriak (Roseville, MI)
Research Advisor: Kristie Payment (Psychology, ONU)

Previous research on expressive writing, writing about personal thoughts, feelings, and emotions has shown various psychological and physical benefits, but little research has delved into the possible impact of expressive writing on memory. There are various techniques that individuals employ in attempting to improve memory for information that is needed to be remembered. One specific way that has been shown to have a positive impact on memory recall is the self-reference effect (SRE). Barney (2007) provided support that incorporating personal aspects to one's writing can have a profound impact on memory. Thus, it is possible that harnessing the SRE with expressive writing could potentially influence memory recall ability. A 2x2 between-subjects design manipulating writing style (expressive or non-expressive) and time of testing (immediate or delayed) was conducted to explore the impact of these factors on memory. Specifically, the number of questions answered correctly on a comprehension test was calculated. Sixty-six participants (29 males, 37 females; mean age of 19.61 years) wrote either expressively or non-expressively after viewing an 11 minute video. Depending on condition, participants took a 39 question comprehension test on the content of the video either immediately or after a 15 minute delay. A 2x2 between-subjects ANOVA indicated that neither writing style nor time of testing had a significant impact on participant's scores. A possible explanation for the present findings may be that the manipulation of expressive writing was ineffective in engaging aspects of the SRE in the participants. Additionally, a difference of 15 minutes in terms of time of testing may have not been strong enough to detect a difference.

“The Mic Over There”

Paper 2, 11:10 a.m.-12:30 p.m., Deans' Heritage Room
Presenter: Nicholas Pesetsky (Olmsted Falls, OH)
Research Advisor: Douglas Dowland (English, ONU)

"The Mic Over There" is a creative nonfiction piece detailing two incidences in the life of a student trying stand-up comedy. It entails very personal moments and thoughts from the narrator to illustrate the visceral nature of stand-up comedy. The narrator attempts stand-up in two uncomfortable settings that influence his overall attitude toward comedy.

“The Miraculous Power in Animation: A Look at Power and Gender Roles in Animation”

Paper 4, 11:50 a.m.-1:30 p.m., Room 202
Presenter: Danyel Heilman (Kenton, OH)
Research Advisor: Robert Carrothers (Sociology, ONU)

Miraculous Ladybug: Tales of Ladybug and Chat Noir is an anime-inspired television show that utilizes CGI graphics detailing the superhero life of Marinette Dupain-Cheng and her partner Adrien Agreste (Nerdmuch). Compared to research on gender archetypes of previous superhero roles held in television series *Miraculous Ladybug* is the new generation of hero that will alter and influence younger generation's conceptions of what qualities both physical and mental it takes to become a hero. *Miraculous* has become the number one kids' show in countries such as Spain, South Korea and France (RySenkari, 2016). Zagtoons, the company behind *Miraculous Ladybug*, constructs new superhero shows that focus more on powerful female leads and unique superhero powers that stray away from typical abilities such as invulnerability and flight. Zagtoons as a company hopes to help redefine the superhero criteria. These trends are important because *Miraculous* is serving to break down gender stereotypes of female and male superheroes. It can arguably be a reflection of new trends in gender roles and potential female empowerment. Through the lens of Weber and other theorists, *Miraculous Ladybug's* importance and power in society, such as Marinette's leadership role, can be assessed and in part explained.

“The Philippines' Prison Systems”

Poster 10, 1:30-2:30 p.m., Activities Room
Presenter: Derek K. Price (Manasquan, NJ)
Research Advisor: Nusta Carranza Ko (Comparative Politics, ONU)

The Philippines has struggled for many years to maintain their deteriorating prison systems. In the last decade, their entire penal system has taken a turn for the worst, which has been marked with rampant overpopulation, and as a result their prisons' infrastructure has begun to collapse. The Philippines is not the only nation that struggles to maintain their failing prison systems but, it is one of only a few nations known for having some of the worst prison conditions in the world. Through an analysis on the prisons based around articles and other scholarly research, this paper examines the failing systems within Philippines. Specifically, I focus on the increasing overpopulation with the prisons and the effects associated with that such as the wellbeing and general health of the prisoners, interactions between prisoners and guards, safety of the prisoners, and the overall level of security present at these facilities. The analysis of the Philippines prison system shows that overcrowding is a primary issue which causes the emergence of other serious problems, as shown above, within the prison systems. While the Philippines' prison systems may be a specific case, an analysis of this topic may enable policymakers with that nation and other nations to create legislation and put in place certain procedures to combat issues of overpopulation within their own prisons. A case study of the Philippine's prison system will shed light on the possible ramifications that prisons can experience once they surpass maximum occupancy.

“The Role of Sleep Duration on Athletic Performance in Collegiate Endurance Track Athletes”

Poster 2, 12:20-1:20 p.m., Activities Room
Presenters: Chelsea Legge (Kenton, OH); Stephanie Brookens (Louisville, OH)
Research Advisor: Michelle Wilson (Athletic Training, ONU)

Context: Athletic performance success is very important for intercollegiate competition, and if the duration of sleep could aid in performance, then our athletes could succeed in a natural and healthy way. Educating ourselves and student-athletes from evidence-based research on the importance of sleep duration is critical. **Objective:** This study will evaluate whether sleep duration will have an impact on the athletic performance on endurance athletes. The overall purpose of this study is to evaluate if athletes who achieve 7 or more hours of sleep in a night have a higher frequency of meeting their training pace. **Design:** This study is a quantitative study. The study design of the project being reported utilizes a cross sectional analysis. **Setting:** The environment in which the study will take place and be conducted is at an athletic event, specifically after practice. This choice of environment is to help the readers better understand the transferability of the findings. **Patients**

or Other Participants: The targeted population is ONU undergraduate intercollegiate student track athletes (18-24 years old), including both males and females. These athletes are those who currently participate in the 3k, 5k and 10k races at ONU. The sample selection procedure that will be used is a targeted convenience sample. The final response rate is pending. **Interventions:** The independent variable is how much sleep the targeted athletes are getting the night before. The survey will be administered through an email and as a paper survey. This type of survey development is from formative research. The participants will report the amount of sleep through a computer-based program. **Main Outcome Measures:** The dependent variable in this study is the training pace time that will be recorded. The training pace data that will be collected after practices should answer the primary research objective. **Results and Conclusions:** Pending testing.

“The Venezuelan Prison System”

Poster 9, 1:30-2:30 p.m., Activities Room
Presenter: Derek K. Price (Manasquan, NJ)
Research Advisor: Nusta Carranza Ko (Comparative Politics, ONU)

States across the globe struggle with maintaining and running successful prison systems. The problem is apparent in Venezuela, a country with one of the worst prison systems in the world. Using archival data primarily from Venezuelan government penitentiary systems documents and by various human rights organizations' reports on prison reform and conditions, this paper analyzes the Venezuelan prison systems. In particular it focuses on the possible relationship between overpopulation and its corollary factors such as the health of prisoners, access to rehabilitation and job training, and the security of prisons, with deteriorating prison conditions in Venezuela. The findings of the research show that overcrowding is the catalyst for many of the problems that face Venezuela's prison system. The conclusions of the Venezuelan case, while case specific, also helps policymakers in other states on developing mechanisms to prevent and confront prison capacity problems experienced in Venezuela.

“Titus, Everybody, Let's Give Him a Hand”

Paper 3, 11:10 a.m.-12:30 p.m., Deans' Heritage Room
Presenter: Kathryn Claire Kuchefski (Spencerville, OH)
Research Advisor: Eva McManus (English, ONU)

This paper considers which persona is most significant to Shakespeare's Titus Andronicus, avenging father or Roman leader. I assert that Titus is both. To support this argument, I critically analyze words and actions of major characters with deconstruction. First, Titus' role as an avenger is closely tracked and supported with several scenes and outside research. The paper then considers that Titus is actually acting as a Roman leader. A majority of current research emphasizes that Titus is primarily an avenger, but this paper argues that Titus also remains a Roman warrior. The paper incorporates feminist analysis to evaluate the roles of women in the play and their effects on Titus. My analysis shows that his daughter Lavinia and former Goth Queen Tamora are set up as opposing Roman women; Lavinia is the "perfect woman" while Tamora places her own happiness above all. Each plays a part in guiding Titus' choices, contributing to the analysis of his motivations. Because of the women's roles, he will go to extreme measures to avenge his family, but in order for that to happen, his family loyalty must surpass his loyalty to Rome.

“Tracheostomy Suctioning Education for Nurses in an Acute Care Setting”

Poster 11, 11:10 a.m.-12:10 p.m., Activities Room
Presenter: Michaela Gutierrez (Moon Twp., PA)

Research Advisor: Megan Lieb (Nursing, ONU)

Tracheostomy suctioning is an essential aspect of effective airway management. Nurses require regular skills review regarding tracheostomy management to feel comfortable with this skill and perform the task. The purpose of this quality improvement project is to develop competency and effectiveness in nursing staff in tracheostomy suctioning. Using a Likert scale, nurses will complete a pretest to determine their baseline knowledge of tracheostomy management and competency performing the skill. An educational guide will be developed for nursing staff and presented at the hospital's annual Nursing Skills Day for overall staff awareness. Lastly the nurses will complete a post-survey to evaluate effectiveness of the educational intervention. It is expected nurse's knowledge and confidence with tracheostomy care and suctioning will increase.

“Wealth and Auto Sales, A Geospatial Analysis”

Poster 21, 1:30-2:30 p.m., Activities Room
Presenter: Zachary P. Zimmerman (Lindsey, OH)
Research Advisor: Harry J. Wilson (Management & Geography, ONU)

The purpose of this research is to assess the relationship between wealth and automobile preference. I utilize a common geospatial analysis method in which resident locations provide the backdrops from which to conduct research. Specifically, I compare new car sales and leases from the Big three in Ottawa County, Ohio. Variables also include the amounts of money spent on new vehicles, the brands of vehicles purchased, and family income in the area. Additionally, comparisons are conducted looking at age ranges and the income of the people in the Ottawa county and surrounding county areas. The results of this research demonstrates the amount of money somebody is willing to pay for a certain brand of vehicle based on their income and their age. I conclude that the wealthier a region, the more expensive vehicle somebody is willing to purchase.

“Working Hard to Remember: Academic Habits and Working Memory”

Poster 5, 1:30-2:30 p.m., Activities Room
Presenters: Sara Lininger (Urbana, OH); Danyl Heilman (Kenton, OH); Caitlin C. Nahiriak (Roseville, MI); Clara Huffman (Avon Lake, OH)
Research Advisor: Ann Johnson (Psychology, ONU)

Procrastination, which can lead to impairments in academic performance, is a pervasive concern for college students. From a clinical perspective, procrastination is a prominent feature of ADHD. Individuals with ADHD are known to have deficits in working memory as well as procrastination, although there is limited research to connect the two areas of study. In previous research, we have found that self-reported working memory functioning related to procrastination when assessed using the Procrastination Assessment Scale - Student Version (Solomon & Rothblum, 1984). However, research on the exact nature of deficits in working memory functioning among those with ADHD has suggested that the problems may lie within secondary memory storage rather than in the active maintenance component of working memory (Gibson et al., 2010). The current study investigated the relationship between secondary memory storage performance and academic procrastination by asking college students to complete two computerized measures of working memory (spatial and verbal immediate free recall). Alongside this, participants completed three self-report measures, two measures of procrastination, and one measure of adult ADHD symptoms. We hypothesized that the secondary memory component will be negatively correlated with self-reported academic procrastination.

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Please join us next year, Friday, April 27, for the 2018 Student Research Colloquium!