CELEBRATIONS of

SCHOLARSHIP

AND POSTER SYMPOSIUM

2019
Scholarship is the act of learning, the knowledge acquired through studies, and the culmination of academic achievement.
Celebrations of Scholarship showcases the outstanding work of Millikin students, proving that an education born from Performance Learning develops accomplished scholars prepared for graduate, professional, and personal success.

During this celebratory event, students from across the University will present the results of their research, scholarship, and creative efforts to the Millikin community. Multiple concurrent sessions modeled on a scholarly conference format, organized independently by each department, will run across the campus. In addition, the annual Poster Symposium will highlight the scholarly work completed by students in regularly scheduled courses, seminars, independent studies, directed studies, internships, SURF, Leighty Scholar, Long-Vanderburg Scholar, and James Millikin Scholar projects.
Performance Learning Lives at Millikin University

Celebrations of Scholarship are a demonstration of the remarkable breadth and depth of high-quality academic engagement students experience at Millikin University. The rich fabric of student learning made possible through Performance Learning, which invites and challenges students to do the real work of the disciplines they study is put on full display. Through Performance Learning experiences students apply and demonstrate the meaning and effectiveness of academic learning integrated with professional activity and application. As students present, perform, explain, and teach for Celebrations of Scholarship events, the best of the university experience is put forward - the fruits of countless hours of student work, study, practice, attention, energy, and striving. Millikin University shines through the vibrant community of thinkers and doers who contribute to the range and depth of the student work given a public forum during the Celebrations of Scholarship.
Celebrations of Scholarships is such an exciting day. For students in the College of Arts and Sciences, this is a day of harvest, where they get to share their creativity, scholarship, investigations, explorations, and discoveries. Many of the projects you will hear about today are the result of months, even years, of hard work in collaboration with faculty and peers. The students are proud and ready to present the fruits of their labor.

Faculty in the College of Arts & Sciences expect students in all of our academic programs to discover, create, and use newly acquired knowledge. This is true of first-year students in University Studies classes (as evident in today’s Freshman Focus Presentations) AND this is true of ALL of our students at every stage of their academic growth in their disciplines. Millikin students are here to be THE makers, THE innovators, THE discoverers, THE research collaborators, and THE creative users of new knowledge.

For several students, their presentations today will be the first time they are sharing their work with audiences beyond their classrooms and laboratories. But many College of Arts & Sciences students have presented research at national and regional conferences this year, and for them Celebrations of Scholarship is an opportunity to share their nationally-recognized work here, on their home campus. Several of our students have also competed as teams at regional or national academic competitions such as MOOT Court, Model Illinois Government, Model United Nations and the Ethics Bowl. Our journalists and media students have received national awards for radio production and awards for outstanding journalism. At Celebrations of Scholarship you can see samples of these competitions and award-winning work.

Today is your chance to enjoy these presentations firsthand. I invite you to join in the 2019 Celebrations of Scholarship presentations, forums and exhibits sponsored by the College of Arts & Sciences, join us as we recognize the outstanding achievements of our students. Join us in the celebration of the creativity in the College of Arts & Sciences. Join in the excitement and fun of Performance Learning.
Behavioral Sciences

Effects of Perception of Cost of Education
SH320
8:00 am-8:30 am
Presenter(s): Kasondra Bergmann
Faculty Sponsor(s): Dr. Melissa Scircle
Abstract/Description: I will be presenting my research on the perceived cost of college as a barrier to attending college.

Social Media Effects on Inhibitory Control
SH320
8:30 am-9:00 am
Presenter(s): Merrik Eddington, Nicholas Marcogliese, Georgia Martindale, Jacob Morgan
Faculty Sponsor(s): Dr. Melissa Scircle
Abstract/Description: The Psychology Research Group will present the findings from their 2018-2019 research project. They asked, "Why do people frequently check their phones despite it being rude or dangerous when they can inhibit the urge to check?" They predicted that the more people use social media, the worse their inhibitory control.

Spring Break on the "Rez"
SH320
9:00 am-10:00 am
Presenter(s): Blake Carmichael, Jake Cihak, Emily Bauwens, Abston Newingham, Madison Burress
Faculty Sponsor(s): Mary Garrison
Abstract/Description: Come learn what the members of the Human Service Connection (HSC) experienced as they engaged with the Pawnee Tribe over spring break. This ultimate performance learning experience allowed for an immersive cultural experience with Native American culture and the development of relationships for a lifetime - you don't want to miss what HSC has to share!

Psychology Senior Capstone Presentations
SH320
10:00 am-10:30 am
Presenter(s): Colin Sandgren, Shelby Fultz
Faculty Sponsor(s): Dr. Linda Collinsworth
Abstract/Description: Senior Psychology majors will be presenting the results of their original independent research.

Biology

Effects of elevated salinity on Cuban Treefrog (Osteopilus septentrionalis) tadpoles aldosterone levels, growth, and development
LTSC001
8:00 am-8:30 am
Presenter(s): Erin Lukens
Faculty Sponsor(s): Dr. Travis Wilcoxen
Abstract/Description: Amphibian habitats are challenged with salinization due to environmental factors such as climate change, the use of road salts, and elevated sea levels. High salinity can have negative effects on the physiology and development of species living in freshwater habitats. Aldosterone is a steroid hormone that is produced by the adrenal cortex and is involved in osmotic regulation. We studied the effects of salinity on growth, development, and aldosterone levels in Cuban Treefrog tadpoles. Gosner stage, growth rates, and aldosterone levels were determined for tadpoles among three salinity treatments (150, 250, and 350 ppm) over a six-week period. Aldosterone levels were determined by an enzyme immunoassay of tadpole plasma. There was a significant effect of salinity on growth, development, and aldosterone levels. Tadpoles in the low salt group were larger, more developed, and produced the least aldosterone compared to those in the high salt group. It appears that Cuban Treefrog tadpoles have the ability to respond to high salt levels with increased aldosterone secretion; however, in order to survive high salt concentrations, trade-offs in growth and development must occur to regulate osmotic functions.

Depression vs. Sleep Deprivation: Problems Among College Students
SH320
10:30 am-11:00 am
Presenter(s): Dayle McMahon
Faculty Sponsor(s): Dr. Melissa Scircle
Abstract/Description: I will present my research and findings for my psychology capstone project looking at the impact of sleep deprivation and depression on academic performance.
Use of combined phage exposure in minimizing the development of anti-phage resistance in Klebsiella pneumoniae

LTSC001
8:30 am-9:00 am

Presenter(s):
Jacob Hanes

Faculty Sponsor(s):
Dr. Jeffrey Hughes

Abstract/Description:
This study focuses on isolating and characterizing bacteriophages that have potential for use in phage therapy with Klebsiella pneumoniae. Phage therapy could be advantageous as an alternative or complimentary treatment method for infections of drug resistant K. pneumoniae. The phages should be stable in storage, have high host specificity, lyse their hosts quickly, and yield minimal anti-phage resistance. Bacteriophage isolates collected from Decatur's waste water treatment plant effectively lysed K. pneumoniae in vitro. Of the eleven isolates, there appear to be at least four distinctly different phage types. Of these, two phages expressed notable stability and lytic potential. Phage resistance has been present among trials with all phage isolates. Bacterial anti-phage resistance appears to arise mostly in a temporary manner with the phages being able to compete against the bacteria upon re-exposure. However, bacterial strains that acquired more consistent resistance levels to a single phage type, had significant detriments to growth rate. This decreased growth rate remained in cultures grown in a stress-free environment. Bacterial anti-phage resistance was also shown to be reduced with concurrent exposure to multiple phage types.

Effect of partial blindness on hunting behavior in Saltus scenicus (Araneae: Salticidae) in a controlled environment

LTSC001
9:00 am-9:30 am

Presenter(s):
Douglas Sherrill

Faculty Sponsor(s):
Dr. Marianne Robertson

Abstract/Description:
I conducted this study on Salticus scenicus, a member of the Salticidae family of spiders. I performed my S. scenicus observations on 5 groups of 20 individuals over the course of 10 trials, each experimental group having one pair of eyes uncovered, and the control having all eyes uncovered. The secondary eyes consist of the anterior lateral, posterior lateral, and posterior median eyes. The anterior median eyes, known as primary eyes, are used primarily for stationary focus and defined vision, while the secondary eyes track motion. I hypothesized that all masked groups would attack from closer to prey than the control, would contact the prey more times prior to capture, would take longer to capture prey, and would take more attempts to capture their prey on average than the control group. I also hypothesized that the test groups would have improved capture time over the course of the trials. My data showed that all groups regardless of treatment had improved capture time over the course of the trials. There were no significant effects on attack distance, and no significant effects were seen on attempts either. Those results do not support my hypotheses, however the test groups did make significantly more contacts with prey before successful capture than the control, which supports my hypotheses.

Communication/English Language Center

Exploring Diverse Communication Styles: A Collaboration of Domestic and International Students

SH317
8:00 am-9:00 am

Presenter(s):
Reina Tanaka, Tiffany Leischner, Grace Ruddell, Tianni Yang, Carlisha Applewhite, Brock Snarski, Bella Ingabire, Cristina Aguayo Escudero, Shawn Daniels

Faculty Sponsor(s):
Dr. Nancy Curtin, Brandy Barter-Storm, Julie Lauper

Abstract/Description:
Students from the CO 432 Intercultural Communication class and the English Language Center (ELC) collaborated to explore each other's cultures. Their presentations will create awareness and understanding of the communication styles and cultural differences in a variety of countries around the world. Countries represented by the international students studying at Millikin include the following: Burundi, China, Congo, France, Japan, Pakistan, Rwanda, South Korea, and Tajikistan. Come see students demonstrate performance learning and share their experiences becoming democratic citizens in a global environment. Cultures in this specific session include Burundi, China, and Japan.
Exploring Diverse Communication Styles: A Collaboration of Domestic and International Students

SH317 9:00 am-10:00 am

**Presenter(s):**
Shione Fujiwara, Gabrielle Correa, David Neal, JinYeong Won, Narumi Kokaji, Mehrangez Rahmatowa, Cherissa Kaze, Jessica Joyner, Madeline Bethard,

**Faculty Sponsor(s):**
Dr. Nancy Curtin, Brandy Barter-Storm, Julie Lauper

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Exploring Diverse Communication Styles: A Collaboration of Domestic and International Students

SH318 10:00 am-11:00 am

**Presenter(s):**
Miu Ishii, Farris Bukhari, Hannah Haedike, Julien Yeremian, Bradyn Nokes, Zachary Fisher, Samuel Nsana, DaVante Harrell, Joseph Buhay

**Faculty Sponsor(s):**
Dr. Nancy Curtin, Brandy Barter-Storm, Julie Lauper

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Exploring Diverse Communication Styles: A Collaboration of Domestic and International Students

SH317 11:00 am-12:00 pm

**Presenter(s):**
Geul In Moon, Christopher Misner, Deidre Dalton, Amandine Mayogi, Samson Callcar, Erin Cowger, Candice Pauwels, Natalie Kalala, Gabrielle Singleton

**Faculty Sponsor(s):**
Dr. Nancy Curtin, Brandy Barter-Storm, Julie Lauper

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Exploring Diverse Communication Styles: A Collaboration of Domestic and International Students

SH318 1:00 pm-2:00 pm

**Presenter(s):**
Paul Fernandez, Mattie Williams, Colin Jamison, Yuri Nakazawa, Shelby Fulliz, Delphine Iragena

**Faculty Sponsor(s):**
Dr. Nancy Curtin, Brandy Barter-Storm, Julie Lauper

**Abstract/Description:**
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A Grounded Theory of Women’s Communication with Health Care Providers During Pregnancy

SH318
3:00 pm-3:30 pm

Presenter(s):
JaCarla Anderson, Kirsten Anderson, Nick Followell, Maxwell Gensler, Alora Goodey, Sophie Green, Keajon Jennings, Natalie Krol, Kameryn Kuntu, Maria Mariotti, Ashley Mendenall, Cheyanne Renek, David Rivers, Griffin Sparks, Tatum Wertin, Jordan Williams

Faculty Sponsor(s):
Dr. Tom Duncanson

Abstract/Description:
The public has become acquainted with the long-standing legal notion that corporations are persons, and there is no surprise these “people” want to advocate for their interests. This program presents case studies of corporations communicating with the public to shape public policy and manage crises of reputation.

Environmental Studies

Environmental Studies Major Capstone

Communication Capstone Presentations

SH318
3:30 pm-5:00 pm

Presenter(s):

Faculty Sponsor(s):
Dr. Nancy Curtin

Abstract/Description:
Graduating communication majors will present reflections on their academic and internship experiences.

Environmental Studies

Environmental Studies

History

Shelter from the Storm: The Staley Credit Union During the Great Depression

SH412
1:00 pm-1:30 pm

Presenter(s):
Matthew Nalefski

Faculty Sponsor(s):
Dr. Timothy Kovalcik

Abstract/Description:
Born in the depths of the Great Depression, the Staley Credit Union was a product of a tumultuous period in American history when the only people whom Americans could trust was their neighbors. As the economy collapsed, the credit union movement, which the United States had long been wary to embrace, gained unprecedented momentum. Groups of citizens gathered to form credit unions of their own at tremendous rates as the 1930s progressed—with as many as 100 credit unions being established each month by January 1937. While it tapped into the growing trend toward credit unions, the Staley Credit Union was an early believer in the movement. Employees of the A. E. Staley Manufacturing Company created their own credit union in June 1930, at the onset of the Great Depression. Offering the chance to rely on their coworkers and neighbors, the Staley Credit Union served as a vital insulator to the employees of the Staley Manufacturing Company during the economic crisis.
Political Science

Political Science Capstone Presentations
SH409
9:00 am-10:00 am
Presenter(s):
Julisa Sierra, Julia Peterson, Megan Owens, Caleb Williams
Faculty Sponsor(s):
Amber Lusvardi

Abstract/Description:
Individual research projects completed by political science majors over the course of their senior capstone. Themes include: a modern take on the Watergate scandal, social media and campaign success, Greek involvement and leadership, and masculinity and higher education enrollment.

Sociology

Sociology Capstone Presentations
SH412
10:30 am-11:30 am
Presenter(s):
Ash Haley, Kay-Leigh Shierling, Jamie Tucker, Alissa Cruz, Will Zeisset
Faculty Sponsor(s):
Dr. Kenneth Laundra

Abstract/Description:
Senior sociology students will be presenting on their capstone projects.

Modern Languages

Spanish Major Capstone Projects
SH418
2:00 pm-4:00 pm
Presenter(s):
Isaac Hopper, Rogelio Diaz, Naomi Klingbeil, Katelyn Nika, Nichole Binder, Mallory Christensen, Heidy Perales, Deborah Corr, Jasmin Coronel, Joseph Vargas
Faculty Sponsor(s):
Dr. Eduardo Cabrera

Abstract/Description:
Senior thesis presentation.

Philosophy

Senior Thesis Presentation
SH418
9:00 am-10:00 am
Presenter(s):
Lukas Myers, Isaac Hopper
Faculty Sponsor(s):
Dr. Eric Roark

Abstract/Description:
Presentation of winning HURF papers.

HURF

HURF
SH418
1:00 pm-2:00 pm
Presenter(s):
TBA
Faculty Sponsor(s):
Dr. Eric Roark

Abstract/Description:
Presentation of winning HURF papers.

The Ottoman Canine: Analyzing the Societal Perception of dogs within the Ottoman Empire
SH412
1:30 pm-2:00 pm
Presenter(s):
Lisa Hill
Faculty Sponsor(s):
Dr. Dan Monroe

Abstract/Description:
Dogs shaped the early modern world, and their presence in history should be valued and noted. The complex Middle Eastern/dog relationship is indicative of how colonialism and European intrusion forever altered the Islamic World. We will discuss this complex subject.

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A Look Inside the Process

Often, the only public presentation of an artist’s work is the finished product. Audiences typically don’t have the opportunity to see the applications of theory and practice taking place in the process of the creation of art. The Celebrations of Scholarship in the College of Fine Arts allows us to look inside the process, which involves analysis, research, development of structural and conceptual frameworks, and critically-informed aesthetic judgment. This is the scholarship that informs and is embodied in a work of art.

We invite you to explore the process of creation with our students, and hope that the insights offered will allow you to enjoy the finished products of art making even more fully. Who knows, you may enjoy seeing the process as much, if not more, than the product!

LAURA LEDFORD, DEAN
COLLEGE OF FINE ARTS
Art

Imperial Hotel Exhibition
SH303
1:00 pm-1:30 pm
Presenter(s):
Stephen Gardner
Faculty Sponsor(s):
Edwin Walker
Abstract/Description:
This summer, through the funding of a SURF grant, I worked with professor Edwin Walker to put together a show in the Perkinson Art Gallery, consisting of artifacts from Frank Lloyd Wright’s demolished Imperial Hotel. During my presentation, I will discuss the process of putting the show together, how it related to my major, and what I learned and took from the experience.

Arts Technology

The Journey of MillikinCreates
SH303
1:30 pm-2:00 pm
Presenter(s):
Sara Lawson, Kathryn Franklin
Faculty Sponsor(s):
Jessa Wilcoxen
Abstract/Description:
MillikinCreates was started in the fall of 2016. The original purpose was to promote and share online stories of students, faculty, alumni and in the industry doing performance learning in innovation, technology, and creativity. In the fall of 2018, work began to transform MillikinCreates into a student-run media firm completing jobs for clients using arts technology. As of the spring 2019, the firm is up and running. The student staff want to share their process, as well as tips and advice for making a venture/company.

Music

Quill to Keys: Robert Chumbley’s Five Bagatelles for Piano
PMC110
10:00 am-11:00 am
Presenter(s):
Michael Duling, Leon Lewis-Nicol, Carrie O’Dell, Leah Wier, Allison Williams
Faculty Sponsor(s):
Dr. Silvan Negrutiu
Abstract/Description:
Being the first musician to perform a new work by an established composer is an honor often reserved for performers at the height of their career. Millikin Piano Club students have been gifted this opportunity early, by commissioning a set of bagatelles from American composer Robert Chumbley. Along with their applied professor, five students were the first musicians to explore, interpret, and create these charming piano pieces in a true performance learning experience. In this lecture-recital, they perform the new works and share first-hand accounts of their collaboration with the composer in bringing to life the Five Bagatelles.

The Art of Interpretation

PMC110
11:00 am-11:30 am
Presenter(s):
Becca Husar
Faculty Sponsor(s):
Amy Catron
Abstract/Description:
Through the research of Bach’s Cello Suites, and a contemporary cello piece titled, “Julie-O” by Mark Summers, I will explore the art of interpretation and its influence on music throughout history and today. The line between compositional integrity and the artistic freedom to stray from the notated music is blurred when time, instrumentation, skill-level, and personal style become an element of the performance. As a musician, we must determine the boundaries that we are willing to push or obey when performing a composition.

Theatre & Dance

Shakespeare Corrected
Pilling Chapel
9:00 am-10:00 am
Presenter(s):
Faculty Sponsor(s):
Alex Miller
Abstract/Description:
A presentation on Shakespeare Corrected and all that entails in the program.

TH 325: Playwriting Readings
Pilling Chapel
10:00 am-11:00 am
Presenter(s):
Wil Barden, Tyler Bowlin, Chris Cunningham, Bailey Guinn, Sophie Kibiger, Mel Kumrow, Cori Lang, Samuel Laro, Kirby Lorig, Annie Magan, Ryan Ogden, Hannah Ottenfeld, Rachel Pevehouse, Kendra Steele, Antonio Verdera
Faculty Sponsor(s):
Dr. Tom Robson
Abstract/Description:
Students from the TH 325: Playwriting class will present public readings of their works from this semester. Each reading will be followed by a short guided feedback session, providing audience members an opportunity to engage in the same work the students do in class every day.
Investigations in Costume History
SH320
1:00 pm-2:00 pm

Presenter(s):
Samson Callear, Crystal Claros, Hannah Deaton, Brody Elder, Roberto Graff, Audrey Murphy, Blake Murphy, Katelynn Watkins

Faculty Sponsor(s):
Jana Henry Funderburk

Abstract/Description:
Students of costume history will present their research projects—interpreting clothing from portraits, creating video essays, and spotting reoccurring trends in fashion.

Reflecting on ACDA
SH320
2:00 pm-2:30 pm

Presenter(s):
Jordan Frederick, Cassidy Burroughs, Levi Ehrmantraut, Katie Czajkowski, Cortez Emerson, Olivia Tharpe, Colton Colbert, Bailey Frees, Bryce Bayer, Collin Bradley, Jaylen Rick, Nathan Bonsall, Micky McNaughton, Josie Hand, Lizzie Napier

Faculty Sponsor(s):
Angie Miller

Abstract/Description:
Students will share experiences that result from their attendance at this year’s regional conference of the American College Dance Association.

Levels and Layouts: Assessing the Impact on Dimension in Dance Performance
SH320
2:30 pm-3:00 pm

Presenter(s):
Isabela Karwatowicz

Faculty Sponsor(s):
Angela Miller

Abstract/Description:
Ever wondered what a dance or a scene would look like from the ceiling? In this discussion of research, Bela Karwatowicz will explore the impact of where one views a piece of art affects the viewer’s interpretation.

ABLE
Albert Taylor Theatre
3:00 pm-3:30 pm

Presenter(s):
Levi (Jacob) Ehrmantraut, Mary Heyl, Kathleen Mitchell

Faculty Sponsor(s):
Sean Morrisey

Abstract/Description:
This collection of dance pieces explores how society looks at disability and how dance can be used to empower individuals that may be considered less “able” than the majority of the population.

Repetition is the Mother of Skill: A Play
SH320
3:30pm-4:00 pm

Presenter(s):
McKena Silva

Faculty Sponsor(s):
Dr. Michael Hartsock

Abstract/Description:
JMS project—outlines completion of my play for my James Millikin Honors Project, I have two actors presenting a 4 minute read along with my presentation.
Best Practices Informed by Scholarship

In the College of Professional Studies, we value the development of professionals who engage in active learning while acquiring knowledge. We believe there is no better example of active learning than an individual's engagement in scholarly endeavors. Scholarly engagement improves the body of knowledge of the professional. Scholarly engagement advances the application of theoretical concepts to practiced performance. Scholarly engagement supports the development of partnerships within communities. Scholarly engagement shapes the future of the professions in which we practice.

We celebrate scholarly engagement when ESS students investigate concussive sports' injuries and use that knowledge to improve the overall health of athletes in rural communities. We celebrate scholarly engagement when SOE students complete comprehensive research based upon observations of students in their learning environments. We celebrate scholarly engagement when undergraduate SON students use translational research to improve best practice in the clinical arenas. We celebrate scholarly engagement when the SON graduate students design final projects which pair inquiry and evidence-based practice with focused residencies to improve patient outcomes through quality improvement initiatives.

DR. DEBORAH SLAYTON, DEAN
COLLEGE OF PROFESSIONAL STUDIES
Education

Innovative Strategies in the New Paradigm of Math Instruction
SH303
8:00 am-9:30 am
Presenter(s):
Faculty Sponsor(s):
Dr. Denice Love
Abstract/Description:
This group of junior education majors will present on the results of their research into the most innovative math strategies that are currently shaping the state of math instruction.

Conducting Case Studies in Child Development: One Child at a Time
SH303
9:30 am-10:30 am
Presenter(s):
Maggie Baltz, Sarah Bingenheimer, Gabby Coulthard, Destiny Dickson, Anna Gambol, Kyla Gee, Taylor George, Bre Johnson, Destiny Musick, Morgan Wendt, Amie Williams
Faculty Sponsor(s):
Dr. Georgette Page
Abstract/Description:
This group is composed of early childhood and elementary education majors, who will present on the results of their research into the most innovative math strategies that are currently shaping the state of math instruction.

Contemporary Issues of Education in the U.S.
SH303
10:30 am-11:30 am
Presenter(s):
Destiney Dickson, Megan Garrison, Evan Miller
Faculty Sponsor(s):
Dr. Hee Young Choi
Abstract/Description:
Through the course, ED 209 Foundations of Bilingual Education, students studied a growing population of linguistically and culturally diverse students in U.S. schools and explored ways to meet their linguistic and educational needs. In this project, students conducted research investigating aspects of bilingual education within the sociopolitical context of the United States. They analyze social structures through the use of discipline-appropriate sources and reflect on their responsibilities as teacher candidates, educators, and democratic citizens in the United States.

Reading and the Brain
SH303
11:30 am-12:00 pm
Presenter(s):
Taylor Hartman
Faculty Sponsor(s):
Dr. Ngozi Onuora
Abstract/Description:
This presentation explores the effects of reading on the brain, and it examines the ways in which neurological issues can impact reading development. Special emphasis will be on implications for teaching and learning in the elementary classroom.

Nursing

Implementing an Enhanced Recovery After Surgery Protocol in Colorectal Patients
LTSC108
8:00 am-8:30 am
Presenter(s):
Brandi Dawson
Faculty Sponsor(s):
Dr. Sheila Jesek-Hale
Abstract/Description:
A retrospective chart audit of patient that had colorectal surgery. The audit involves recording the temperatures every 15 minutes with the use of a standardized temperature monitoring device. These patients also have warmed intravenous fluids and a bair hugger to help keep them warm.

Implementation of Anesthesia Specific Student Intern Setup Tool (ASSIST) Into a Nurse Anesthesia Program
LTSC108
8:30 am-9:00 am
Presenter(s):
Nicholas Halford
Faculty Sponsor(s):
Dr. Sheila Jesek-Hale
Abstract/Description:
Student anesthesia interns lack knowledge and understanding of the details that contribute to complete operating room setup when initially entering clinical practice. A lack of experience contributes to an increase in the frequency of incomplete operating room setups. Incomplete room setup is correlated with a decrease in patient safety and increases the risk of patient morbidity or mortality. The project coordinator developed and implemented the Anesthesia Specific Student Intern Setup Tool into a nurse anesthesia program and evaluated the outcome.
Effective Patient Education in the Emergency Department
LTSC108
9:30 am-10:00 am
Presenter(s):
Amie Bauer
Faculty Sponsor(s):
Dr. Elizabeth Gephart
Abstract/Description:
The environment of the emergency department is typically loud and disruptive. The emergency nurse is focused on saving and stabilizing the patient, which could leave little time for effective patient education. The lack of efficient and effective patient education is causing repeated emergency room visits and hospital admissions leading to an increase in cost and poor patient outcomes. Patient education continues to be a core component in the practice of nursing. The purpose of this project is to review the current evidence relating to patient and family education in the emergency department, because patient outcomes are being negatively affected. The goal is to identify gaps in the literature and include evidence-based recommendations to implement into the current nursing practice.

Evaluating the Effectiveness of Current Practice in Preventing Post-Operative Nausea and Vomiting
LTSC108
10:00 am-10:30 am
Presenter(s):
Amanda Durbin
Faculty Sponsor(s):
Dr. Elizabeth Gephart
Abstract/Description:
Postoperative nausea and vomiting (PONV) delays a patient’s return to normal function, raises health care costs, and results in a lower degree of patient satisfaction. The numerous adverse outcomes of PONV has resulted in the Centers for Medicare and Medicaid Services (CMS) identifying PONV prevention as an important patient centered outcome of anesthesia care. It is recommended that in order to reduce the occurrence of PONV, patients undergoing general anesthesia should receive a PONV risk assessment and receive preemptive antiemetic combination therapy based upon their score (AMA, 2015).
A central Illinois hospital is currently utilizing the guidelines outlined by CMS for PONV risk assessments and selection of antiemetic therapy. However, the facility had not yet completed a systematic assessment to determine if patients at high-risk for PONV are receiving appropriate and effective prophylactic antiemetic therapy. To determine if patients found to be at high-risk for PONV are continuing to experience PONV despite current preemptive antiemetic treatments preoperatively and intraoperatively, a chart audit was performed. The audit determined if patients at high-risk were needing additional medications post-operatively and if additional recommendations for improvement needed to be made based on CMS guidelines. Ensuring patients are receiving appropriate and effective prophylactic antiemetic treatment is necessary to promote high quality care, leading to improved patient outcomes.

Characteristics of Patients Who Self-Manage Chronic Illness: Questions for Patient Discharge
LTSC108
10:30 am-11:00 am
Presenter(s):
Ekaterini Pliakos
Faculty Sponsor(s):
Dr. Jo Carter
Abstract/Description:
A review of literature has found the most common characteristics that patients have who can properly self-manage their chronic illness. Based off of the findings, a questionnaire was created for nurses to use so they are able to quickly determine if their patient can self-manage their hypertension. The questionnaire was piloted on an inpatient unit at Decatur Memorial Hospital and the results will be presented.

Best Practices for New Graduate Nurse Residency Programs
LTSC108
11:00 am-11:30 am
Presenter(s):
Haley Thorpe
Faculty Sponsor(s):
Dr. Jo Carter

Abstract/Description:
New graduate nurses comprise 10% of an organization's nursing staff (Hopkins & Bromley, 2016). New graduates are faced with the challenge of transitioning to practice from the classroom setting. Nurse residency programs are designed to provide new graduate nurses with a resource in their first year of practice. An integrative review of the literature was conducted to analyze components of nurse residency programs associated with their respective outcomes. The implementation of a nurse residency program provides the new graduate nurse with support, education, and clinical skills required of a registered nurse. Proposed analysis of this literature review will be presented.

Defining and Teaching Reflective Practice in Nursing Education
LTSC108
1:00 pm-1:30 pm
Presenter(s):
Sarah Lang
Faculty Sponsor(s):
Dr. Pam Lindsey

Abstract/Description:
This presentation will examine current definitions of reflective practice in order to determine a working definition that directly relates to nursing education. Impacts of reflective practice on nursing student outcomes will be explored. Graham Gibbs' Reflective Cycle will be used to demonstrate reflective practice. Finally, recommendations for the implementation of reflective practice in a nursing education setting will be discussed. By the end of this presentation, learners will be able to define reflective practice as it applies to nursing, identify positive outcomes in student performance that result from reflective practice, and apply Gibbs' Reflective Cycle to their own practice situations.

Development of a Clinical Protocol to Address Postoperative Pain Following Carpal Tunnel Release Surgical Procedures
LTSC108
1:30 pm-2:00 pm
Presenter(s):
Evelyn Mitchell
Faculty Sponsor(s):
Dr. Mary Jane Linton

Abstract/Description:
Postoperative pain control following carpal tunnel release (CTR) surgery is a complex problem that impacts patient satisfaction, outcomes, and safety. Each year, over 400,000 patients undergo CTR surgical procedures, representing a significant social burden and expense to the United States. Inadequate management of postoperative pain following CTR results in the challenging process of seeking to relieve patients pain adequately. Opioids are the most potent pain relief medications used to control postoperative pain. The current opioid crisis coupled with the emphasis on providing aggressive and effective postoperative pain relief has resulted in a complicated process. Therefore, the need to address postoperative pain management following CTR requires the development of an evidence-based practice protocol to enhance patients recovery, minimize opioid misuse, and subsequently decrease healthcare costs.

Scholarly Teaching Presentation: Crisis and Disaster in the Context of Psychiatric Nursing Education
LTSC108
3:00 pm-4:00 pm
Presenter(s):
Molly Quigley
Faculty Sponsor(s):
Dr. Elizabeth Gephart

Abstract/Description:
This presentation explores crisis theory in the context of psychiatric nursing education, providing an educational foundation for the nursing process of a patient in crisis. Impacts developing from the different types and phases of crisis will be investigated. Nursing interventions for crisis will be assessed. Lastly, psychiatric nursing contributions during a disaster will be analyzed. By the conclusion of the presentation, the learners will have the ability to use crisis theory, to assess the types and phases of crisis, aiding in the development of constructive nursing interventions for a patient, and understand the nursing role during a disaster.

A review of literature has found the most common characteristics that patients have who can properly self-manage their chronic illness. Based off of the findings, a questionnaire was created for nurses to use so they are able to quickly determine if their patient can self-manage their hypertension. The questionnaire was piloted on an inpatient unit at Decatur Memorial Hospital and the results will be presented.
In Tabor, students engage in scholarship not only through research, but through putting their ideas and discoveries into practice. They may build a new venture or solve a complex business problem for a client. We believe competing will give students the confidence they need to succeed. Today you’ll see why as students from a variety of majors across campus compete for cash prizes in the Idea-to-Incubator Competition where their “pitches” will be judged by entrepreneurs and venture capitalists. Or, watch our newest Tabor students compete for prizes in the Freshmen Business Plan Competition. If you can’t fit in either of these events, perhaps you would like to see what students are doing in the new student-run ventures Blue Brew and MU Performance Consulting. Whatever you choose, I think you will be impressed by the capabilities of our Millikin students! This is a fantastic way to lift up and celebrate their good works.
Information Systems

MU Performance Consulting Semi-Annual Stakeholders Meeting
SCO207
9:00 am-10:00 am
Presenter(s):
Mikayla Krieger, Jack Morgan, Alex Pratt, Greg Schweppe, Seth Hansen, Madeline Holland, Ryan Sikora, Zechariah Burrus, Gabriel Gil, Benjamin Maynard, Paul Smith, Jordan Williams, Julia Zmucki
Faculty Sponsor(s):
RJ Podeschi
Abstract/Description:
MU Performance Consulting is an information systems-focused, yet multidisciplinary student-run venture. Students work with clients in the community and on campus to design and deliver technical solutions to business problems. Student consultants will provide summaries of recent technical and business projects, financial statements, and make forward looking statements related to strategy. In addition, this presentation serves as the semester update to the advisory board.

Entrepreneurship

Blue Brew
SCO207
11:30 am-12:00 pm
Presenter(s):
Reese Crawford, Taylor Isaia, Lauren Jones, Courtney Brady, Mari Court, George Jimmerson, Alexzander Clark, Loren Agee
Faculty Sponsor(s):
Julie Shields
Abstract/Description:
Blue Brew will be speaking about the company progress, each individual team’s work, and what the students have learned through this class so far. We will have a PowerPoint for this event showcasing our progress and allowing time at the end for anyone to ask questions.

Tabor School of Business

Celebrating High School Innovators
West Towne (1099 W. Wood St.)
8:00 am-2:30 pm
Presenter(s):
State of Illinois High School Semi-Finalists
Faculty Sponsor(s):
Julie Shields
Abstract/Description:
Celebrating High School Innovators is a statewide competition presented in partnership by Millikin University, Illinois State University, and Pontiac Township High School. The competition identifies, fosters, and celebrates exceptional innovations in: Arts, Media & Literature, Business Entrepreneurship, Health & Nutrition, Social Entrepreneurship, Science, Technology, Engineering & Math. The top 30 innovations will compete today for five $1,000 cash prizes and scholarships to both universities. Innovations will be displayed in the first floor of West Towne building (1099 W. Wood Street).

2019 Freshman Business Plan Competition
SCO207
10:00 am-11:30 am
Presenter(s):
The Rec
Collin Schlapper, Austin Catton, Kameryn Kuntu, Seth Germann, Jon Kuebler
University Mart
Aubrey Stanton, Aly Armstrong, Christian Chandler, Cole Lewis, Jess Gillam
Faculty Sponsor(s):
Dr. Mark Munoz, Dr. Yuhan (Jane) Hua
Abstract/Description:
Select teams of freshman from the fall 2018 BU100 Business Creation course present the business plans they created and compete for up to $4,000 in international immersion scholarships.
Critical Storytelling in Millennial Times

Undergraduates Share Their Stories of Struggle

EDITED BY
Carmella J. Braniger and Kaytlin M. Jacoby

BRILL | SENSE
Critical Storytelling in Millennial Times

A collection of essays from Millikin students

Critical Storytelling in Millennial Times gathers outstanding essays of undergraduate writers at Millikin University for publication and release into the academic community by international publisher Brill/Sense, one of the fastest growing publishers of books in Educational Research and related fields. This publishing project originated with a two-year PLEG (Performance Learning Enhancement Grant), a grant which supported innovative curriculum and teaching contributions to university-wide Performance Learning. The Critical Storytelling project fosters a classroom environment where students do the discipline, meaning peers motivate peers to create high-quality work, improve writing and editing skills, and inspire student leadership. The end result is an undergraduate student produced volume of essays exploring the struggles of millennials in higher education.

Come to our 2019 COS panel to hear about Critical Storytelling’s new developments with the Decatur Correctional Center for Women, celebrate our second year of publication, and hear from a panel of featured writers and editors who will discuss their first-hand experiences with Critical Storytelling.

Critical Stories from Marginalized Voices: A Collaborative Classroom Project Turned Book Series

SH317
3:00 pm-4:30 pm

Presenters:
Kaytlin Jacoby, Alexsania Ralat, Dean Larrick, Rebekah Icenesse, Kathryn Coffey, Megan Batty, Kaia Ball, Jacquelyn Spence, Laura Nearing, Amanda Minetti

Faculty Sponsor(s):
Dr. Carmella Braniger

Abstract/Description:
This panel will present the English Department’s Critical Storytelling project, which started with a Performance Learning Grant and has grown from several published volumes into an entire series with an international publisher. From graduate students in urban settings to high school and college students taking courses at a small comprehensive university, to inmates at a female correctional facility, we have been teaching students across the midwest to write and publish their critical stories. Millikin student speakers will read their own stories either already published or forthcoming in the next volume and discuss their roles as editors for the project.
The Millikin Medal for Excellence in Young Adult Literature

Now in its fourth year, the Millikin Medal for Excellence in Young Adult Literature brings together future educators, journalists, writers, historians, and librarians to organize, present, and sustain a literary award. The judging panel, made up of Millikin faculty and students, evaluates works of literature aimed at young adults (defined by the founding members as literature aimed at high school and college-aged readers), evaluates nominated titles, all of which were published during the previous academic year, on a variety of factors related to diversity, inclusion, and literary merit.

This year’s presentation will cover our activities in year four as we continue to grow the medal. We’ll talk about how we narrowed from the original list of submissions to the long list, the short list, and ultimately the winner. Students will also focus on how the group facilitates critical thinking, collaboration, and exposure to diverse authors and titles. Finally, we will announce this year’s winner and honor book(s).

The Millikin Medal for Excellence in Young Adult Literature
SH317
2:00 pm-3:00 pm

Presenter(s):
Aiyana Davis, Bella Hernandez, Marissa King, Alexia McDermott, Destiny Musick, Teressa Naples, Rachel Roberts

Faculty Sponsor(s):
Rachel Bicicchi, Amanda Pippitt, Karly Grice

Abstract/Description:
This year’s presentation will cover our activities in year four as the Millikin Medal continues to grow and evolve. We’ll talk about the process of choosing a winner, as well as how the group facilitates critical thinking, collaboration, and exposure to diverse authors and titles. Finally, we’ll announce this year’s winner and honor book(s).
The Long-Vanderburg (LV) Scholars Program honors the first two African American graduates of Millikin University, Fred Long and Marian Vanderburg. In 2010, under the leadership of 1975 Millikin University alumnus and former CEO and Executive Chairman of Caterpillar Inc., Doug Oberhelman, the program received a generous gift from Caterpillar, Inc. and was renamed the Long-Vanderburg Caterpillar Scholars Program.

The Long-Vanderburg Scholars Program is an honors program that provides historically underrepresented students and those committed to social justice and diversity & inclusion, with the opportunity to uphold and contribute to the legacy of academic excellence, leadership, and service at Millikin University. Scholastic Achievement, Civic Responsibility, Leadership and Educational Advancement are emphasized through a four-year program offering both curricular and co-curricular activities.

During Celebrations of Scholarship, Freshman through Senior Long-Vanderburg Scholars will present original research that explores their position in society, their ever-growing leadership models, their professional creeds, and also their development as citizen-scholars. Join them as they showcase what it means to be Long-Vanderburg Scholars at Millikin University!
Long-Vanderburg Scholars Program

LV First-Year Research and Exploration Presentations
SH420
8:00 am-10:30 am

**Presenter(s):**
Alex Kennedy, Christina Hoving, Amaya Coleman, Charline Pate, Emily Lopez, Nico Mho, Erica Reyes, Oluwafunke Odufuwa, Shelby Jones, Trevor Greenwood

**Faculty Sponsor(s):**
Dr. Vicky Gilpin

**Abstract/Description:**
The first-year LV students will present their individual analyses of selected representations of identity in popular culture, what those representations could mean in light of social justice and personal understanding, and incorporate concepts of identity and self-reflection as LV scholars in regard to leadership, historical understanding of diversity and culture, and extension of social justice.

Achieving effectively your Personal and Professional Goals
SH420
10:30 am-12:00 pm

**Presenter(s):**
Alicia Cunningham, Delphine Iragena, Heidy Perales, Cody Rodas, Noah Villarreal, Caleb Williams

**Faculty Sponsor(s):**
Dr. Paul Toure

**Abstract/Description:**
All of us have various purposes in life. We want to accomplish different goals for ourselves, have nurtured relationships, serve, and contribute to society. And yet, we struggle to secure enough time and energy we need to set aside to reach these goals. Throughout their studies here at Millikin University, these LV Seniors have strived to learn how to prepare themselves in acquiring the specific habits and principles that have allow them to achieve their personal, academic, and professional goals. The intention of these presentations is to show how these LV scholars have achieved their overall personal and academic goals.

Genuine Leadership in an Ever-Changing World
SH422
1:00 pm-3:30 pm

**Presenter(s):**
Maggie Baltz, Kailani Bartley, David Bruns, Zac Cary, Patrick Karangwa, Sophie Kibiger, Mackenzie Kiewitt, Montana Malmen, Patrick Maloney, Marissa Martinez, Alida Mugisha, Stella Mutoni, Saamia Salik, Selena Smail, Haley Yemmer, Nina Wagner, Kawai’ol Wong

**Faculty Sponsor(s):**
Maire Foxx

**Abstract/Description:**
Everyday, we step into the world with dreams, ambitions and goals to make lasting change that is positive, productive and unique. Giving thought to who we are, what type of leadership we provide and whether or not we are growing is placed on the back burner when in fact it should be priority. Why? Because if we are not our genuine selves, we cannot expect others to be that which we are not.

Within our presentations, we will explore who we are, which leadership style(s) we have found to be successful, and provide our understanding of what it takes to be great leaders by being "the real, genuine me.”

Personal Leadership Philosophy: A video presentation
SH420
2:00 pm-4:30 pm

**Presenter(s):**
JaCarla Anderson, Taylor Bailey, Alphonso Echols, Kiara Fultz, Alex Herrera, Diana Juarez, Rubi Rodriguez, Johnathan Sumler, Kimberly Tejada

**Faculty Sponsor(s):**
Dr. Kimberly Mungaray

**Abstract/Description:**
LV students will present their personal leadership philosophies through a creative video presentation. These videos will present each student's philosophy of leading in and through a complex and diverse world.
Millikin’s Poster Symposium celebrates the spirit of student-faculty Performance Learning. This annual event was developed by the Office of the Provost to provide students the opportunity to share their scholarly activities, practice critical communication skills, and engage in meaningful research. Poster Symposium judges, selected from Millikin retirees, alumni and friends, represent a host of scientific careers and employers, including: Akorn Pharmaceuticals, Apex Network Physical Therapy, Archer Daniels Midland Co., Baxter International Inc., Cancer Care Specialists of Central IL, Decatur Memorial Hospital, Decatur Public Schools, Dove, Inc., EPL Bio-Analytical, HSHS St. Mary’s Hospital, Illinois Raptor Center, Johnson & Johnson Pharmaceuticals, Midwest Sight Foundation, Precision Biomarker Resources, Sanitary District of Decatur, and the State of Illinois.

In 1994, Judith “Judy” and the late G. Richard “Dick” Locke, M.D., began providing financial support for the Poster Symposium. In celebration of the Locke family’s longstanding support of Millikin, the University seeks to establish an endowed fund for The Judith and G. Richard Locke Undergraduate Research Poster Awards. Mrs. Locke has provided a seed gift to create the fund. With your monetary collaboration, we will grow this endowment fund to provide prizes for notable, high-caliber undergraduate research projects.

To learn more about The Judith and G. Richard Locke Undergraduate Research Poster Awards and how to make a donation to the fund, please visit bit.ly/poster-awards or contact Kim Holman Mangan ’96, director of corporate and foundation relations, at 217-420-6658 or kmangan@millikin.edu.
1 HABITUATION AND DISHABITUATION TO A VIBRATIONAL STIMULUS IN THE EARTHWORM, LUMBRICUS TERRESTRIS (ANNELIDA: LUMBRICIDAE)

Biology

Author(s): Jessica Goeckner, Dr. Marianne Robertson

Faculty Sponsor(s): Dr. Marianne Robertson

Millikin University

Abstract/Description: Although they are a prominent species in the ecosystem, little research has been conducted on the memory and learning abilities of Lumbricus terrestris despite plentiful studies addressing learning in other invertebrate species. Habituation, a form of non-associative learning, is the diminishing of a physiological response to a frequently repeated neutral stimulus. Dishabituation is the subsequent recovery of the response as the interval between stimuli lengthens. To examine habituation, we exposed control earthworms (n = 24) to a vibrational stimulus of 6 Hertz twice for 10 sec, separated by an interval of 30 min. We exposed experimental earthworms (n = 24) to the same vibrational stimulus for 10 seconds over the course of 10 trials separated by 2 min. intervals. For experimental earthworms that habituated, we ran 15 subsequent trials with the intervals doubled in length after each trial to examine dishabituation. We began timing each interval after responses ceased. For each trial, we recorded presence versus absence of a response to the neutral tactile stimulus, as well as the duration of each response. We will analyze data using a paired t-test (control group) and a repeated measures ANOVA (experimental group). Our data analysis should indicate whether L. terrestris is capable of non-associative learning in response to a neutral stimulus and how long it is able to retain this memory before subsequent recovery of the response. The earthworm L. terrestris might be an inexpensive and simple model for demonstrating neural bases of learning.

2 THE EFFECT OF THE REMOVAL OF SHORT OPEN READING FRAME 19 ON THE GROWTH OF SACCHAROMYCES CEREVISIAE IN THE PRESENCE OF QUININE

Biology

Author(s): Rachel Fox, Dr. Jenna Smith

Faculty Sponsor(s): Dr. Jenna Smith

Millikin University

Abstract/Description: Sequences of DNA that have a possibility of being translated are open reading frames. These open reading frames are transcribed into messenger RNA which is then translated into proteins. The proteins go on to provide function throughout the cell. Short open reading frames (sORFs) were once overlooked by the scientific community due to their small size. Recently, researchers have utilized various methods to determine significance and function for some. The goal of this experimental research was to investigate a possible function for a new yeast sORF, sORF-19. A wildtype strain of yeast, Saccharomyces cerevisiae, and a strain of the same yeast with the sORF-19 removed were tested for their growth in the presence of quinine, an antimalarial drug. It was hypothesized that a strain of S. cerevisiae with sORF-19 removed would show a larger amount of growth measured in colony number, colony size, and growth rate when in the presence of quinine than the wildtype strain. Yeast spot assays and growth curves were used to collect data in the presence of 0%, 2.5%, 3.75%, and 5% quinine to determine any effects of the sORF-19 deletion. Significant differences in survival were found in the quinine treatment for colonies of both the wildtype and sORF-19 deletion yeast strains, and in colony size of the wildtype strain in quinine. Although the initial hypothesis was not fully supported, there was evidence found that showed the deletion of sORF-19 may have an effect on quinine resistance in yeast.

3 AGGLUTININ-LIKE SEQUENCE GENES IN MEYEROZYMA GUILLIERMONDI

Biology

Author(s): Allyson Isenhower, Soon-Hwan Oh, Lois Hoyer, Dr. Laura Zimmerman

Faculty Sponsor(s): Dr. Laura Zimmerman

Millikin University and University of Illinois at Urbana-Champaign

Abstract/Description: ALS genes are important to understand because of their cell adhesion function. Cell adhesion plays an important role in many interactions as well as pathogenesis. Meyerozyma (Candida) guilliermondii is a species in the CTG clade that possesses ALS genes. Although M. guilliermondii has a variety of uses, it is clinically relevant opportunistic pathogen. Knowing the sequences of the ALS genes is critical to understanding how M. guilliermondii adheres to surfaces. DNA sequencing techniques such as Oxford Nanopore, Illumina sequencing, and Sanger sequencing were utilized in this study. Various bioinformatics websites were used to analyze the BLAST results, translate sequences, and read sequencing files. Oxford Nanopore and Illumina sequencing was used to create a genome for M. guilliermondii. A BLAST search yielded five results, but two “hits” were fragments of the same gene. PCR was performed to determine the size of the different gene regions (N-terminal, tandem repeats, C-terminal) and to use as a sequencing template. There were four total ALS genes in M. guilliermondii. Mgt1, Mgt2, and Mgt3 were typical ALS genes. The S’ end of Mgt4 fit the criteria for an ALS gene, but the rest of the gene more closely resembled a different unknown gene family. The tandem repeat region of the genes proved difficult to sequence completely. However, the combination of Oxford Nanopore and Illumina sequencing provided a more accurate assembly of the genome than what was available on NCBI. With the more accurate sequence, gene expression, gene manipulation, and drug development can be investigated.
DETECTION OF WEST NILE VIRUS IN CLINIC-ADMITTED RAPTOR SPECIES IN CENTRAL ILLINOIS

Biology

Author(s):
Owen Pulver, Jane Seitz, Jacques Nuzzo, Dr. Travis Wilcoxen,

Faculty Sponsor(s):
Dr. Travis Wilcoxen

Millikin University and Illinois Raptor Center

Abstract/Description:
West Nile Virus (WNV) is a virus that is commonly found in avian species in the Midwestern United States. WNV commonly follows a bird-mosquito-bird transmission pattern, with birds serving as amplifying hosts, or reservoirs, for the pathogen. We analyzed plasma samples from raptor species that were admitted to a rehabilitation clinic in Central Illinois for two types of antibodies against WNV using an Enzyme-Linked Immunosorbert Assay (ELISA). In all, eight different raptor species were tested. From our survey, we found that Great-Horned Owls (Bubo virginianus) had the highest seroprevalence (38.6%) and Turkey Vultures (Cathartes aura) had the lowest seroprevalence (4.3%) for IgY antibodies. The highest seroprevalence for IgM antibodies was for American Kestrels (Falco sparvarius) with 27.6% and the lowest was Great-Horned Owls with 0.0%. We also saw a pattern of WNV positive cases among seasons that mirrored the pattern of mosquito activity in Central Illinois. Many of the species-specific frequencies from our data differed significantly from those reported in studies done in Wisconsin and Colorado.

SEROPREVALENCE OF LYME DISEASE (Borrelia burgdorferi) IN BIRDS OF CENTRAL ILLINOIS

Biology

Author(s):
Logan Bader, Dr. Travis Wilcoxen

Faculty Sponsor(s):
Dr. Travis Wilcoxen

Millikin University

Abstract/Description:
Many zoonotic diseases, such as Lyme disease, can be transmitted from wildlife hosts and vectors to other populations of wildlife and even human populations in some circumstances. While many studies of seroprevalence of Lyme disease in avian communities remain largely descriptive, this study aims to gain an understanding of which bird species have developed immunoglobulins to the causative agent of Lyme disease, Borrelia burgdorferi. The objective of this study was to analyze the seroprevalence of B. burgdorferi in birds that were admitted to the Illinois Raptor Center in Decatur, Illinois as well as songbirds captured from the wild. We hypothesized that birds that forage on the ground in grassy areas would possess the most elevated levels of IgY and IgM antibodies against B. burgdorferi. We determined from our study that our specific enzyme-linked immunosorbert assays (ELISA) and associated secondary antibodies are able to detect the presence of IgY and IgM antibodies to the causative agent of Lyme disease, B. burgdorferi, based on the ratio of antibodies present in assays positive for antigen versus assays negative for antigen. All but six bird species of 19 surveyed with a sample size of over five individuals had at least one individuals that possessed antibodies to B. burgdorferi. Overall, we found that raptor species typically had a lower percentage of individuals with seroprevalence to Lyme than songbirds, with the exception of the Red-shouldered Hawk and the Northern Harrier.

EFFECTS OF CYPERMETHRIN ON NEUROPHYSIOLOGY, DEVELOPMENT, AND BEHAVIOR OF CUBAN TREEFROG TADPOLES (OSTEOPILUS SEPTENTRIONALIS)

Biology

Author(s):
Jacquelyn Spence, Dr. Travis Wilcoxen

Faculty Sponsor(s):
Dr. Travis Wilcoxen

Millikin University

Abstract/Description:
Cypermethrin is a pesticide designed to disrupt the nervous system of invertebrates, though vertebrates may also be affected. We exposed Cuban Treefrog (Osteopilus septentrionalis) tadpoles to cypermethrin at two different doses and measured neurophysiological and behavioral differences among groups. Tadpoles exposed to cypermethrin were found to be smaller, less developed, and hyperactive compared to a control group, despite showing no signs of altered acetylcholinesterase levels. Overall, our results demonstrate that cypermethrin is a stressor for these animals even though it may not have direct impacts on the nervous system.

HABITUATION AND DISHABITUATION TO A VISUAL STIMULUS BY FRESHWATER GRASS SHRIMP Palaemonetes sp. (Decapoda: Palaemonidae)

Biology

Author(s):
Mckinley Carey, Dr. Marianne Robertson

Faculty Sponsor(s):
Dr. Marianne Robertson

Millikin University

Abstract/Description:
Habitation, a type of non-associative learning where organisms learn not to respond to a repeated neutral stimulus, has been observed in many crustaceans but
Dishabituation is subsequent recovery of the lost response as the intervals between stimulus presentation increase. We examined the ability of a species of freshwater grass shrimp in genus *Palaemonetes* to habituate and dishabituate to a visual stimulus. For our control group (n=18), we conducted two trials separated by a 10 minute interval. For our experimental group (n=16), we conducted 10 trials, separated by 1.0 minute intervals. For each trial, we recorded presence versus absence of a response to the neutral tactile stimulus. To examine dishabituation, we ran subsequent trials on habituated shrimp with time intervals that doubled in length until a response was produced again. For data analysis, we used a paired t-test (control group), a Friedman test and a chi-square test (experimental group). For the control group, there was no significant difference between trial 1 versus trial 2 in the number of shrimp that responded to the stimulus. Experimental shrimp exhibited a significant decrease in the number of individuals that responded to the stimulus over subsequent trials, indicating that habituation occurred. The shrimp also dishabituated and required and average of 4.0 minutes for response recovery. *Palaemonetes* are exposed to many stimuli. Their ability to habituate is adaptive memory capacity of American bullfrog (*Lithobates catesbeianus*; Anura: Ranidae), via habituation and dishabituation to a vibrational stimulus.

**9**

**TIME COURSE OF IMMUNOMODULATORY EFFECTS OF STRESS IN NORTHERN LEOPARD FROG TADPOLES**

* Biology

**Abstract/Description:**
Amphibians serve as an excellent medium for analysis of the immune system due to ease of caring for them and their susceptibility to environmental stimuli. We examined the innate and acquired ability of the Northern Leopard Tadpole (*Lithobates pipiens*) to mount an immune response to a common opportunistic amphibian pathogen, *Aeromonas hydrophila*. We hypothesized that the innate defenses against *A. hydrophila* would be greater in those not experiencing a stressor. We tested these hypotheses using two groups of tadpoles. The experimental group was exposed to corticosterone (CORT) dissolved in ethanol added to their rearing water and the control group was exposed only to ethanol. After six weeks of exposure, we collected blood samples, extracted the plasma, and used an in vitro *A. hydrophila* killing assay to assess innate defenses against the pathogen. We then tested adaptive immune responses, with and without the stressor, by exposing tadpoles to CORT and ethanol as before, but also adding small inoculates of the pathogen. For this experiment, blood was sampled from five tadpoles from each group for six consecutive weeks. Plasma from those samples will be analyzed for antibody responses to the pathogen. From our innate immune study, we found that the experimental group demonstrated a slightly greater pathogen killing potential, which was not consistent with our predictions. Combined, our results will demonstrate the complex interactions of acute and chronic stress on innate and acquired immunity in free-living larval amphibians.
10 DETERMINATION OF THE FUNCTIONS OF IDENTIFIED SHORT OPEN READING FRAMES IN SACCHAROMYCES CEREVISIAE

Biology

Author(s):
Jillian Jones, Dr. Jenna Smith

Faculty Sponsor(s):
Dr. Jenna Smith

Milikin University

Abstract/Description:
Open reading frames (ORFs) do not only encode long chains of amino acids. Short open reading frames (sORFs) are much smaller than what would be expected to code for a polypeptide are found in the genomes of several eukaryotes and have been discovered to be responsible for a variety of functions within the organism. The biological functions of two particular sORFs, sORF-6 and sORF-13, in Saccharomyces cerevisiae were examined by looking for phenotypic differences between their deletion strains and the wild type in various conditions. The deletions strains for sORF-6 and sORF-13 were tested for both survival following exposure to DNA-damaging ultraviolet light (UV) and growth in the presence of a non-fermentable carbon source. Neither sORF-6 or sORF-13 were found to be responsible for survival following exposure to UV radiation. However, removal of sORF-6 was found to affect growth in the presence of a non-fermentable carbon source. While a phenotypic difference was seen in sORF-6, its precise contribution to the metabolism of non-fermentable carbon sources is still unknown.

11 SIBLINGS VS STRANGERS: COOPERATION OR COMPETITION IN ABUTILON THEOPHRASTI (F. MALVACEAE)

Biology

Author(s):
Julia Taraszewski, Dr. Judy Parrish

Faculty Sponsor(s):
Dr. Judy Parrish

Milikin University

Abstract/Description:
Plants communicate with the world around them primarily with their root systems. Some plants have the ability to recognize their kin via root interactions and choose to grow cooperatively with them. Plants that are genetic strangers grow in competition and differ in their success. Abutilon theophrasti, also known as velvetleaf, was planted in treatments of pairs of siblings or strangers growing together. The hypothesis of the study is that A. theophrasti can recognize its kin and would grow cooperatively with it, having fewer differences in biomass in members of the same pot than stranger plants grown together. Statistical analysis of dried plants after 8 weeks found no significant difference in sibling treatment for dry weight of individuals in the same pot. Significant differences were found between the dry weights of plants grown in stranger conditions. Results support cooperative growth between A. theophrasti siblings.

12 CONFERRAL OF STREPTOMYCIN RESISTANCE VIA CRISPR/CAS9 GENOME EDITING IN ESCHERICHIA COLI

Biology

Author(s):
Kaia Ball, Dr. Samuel Galewsky

Faculty Sponsor(s):
Dr. Samuel Galewsky

Milikin University

Abstract/Description:
An amino acid change in the E. coli rpsL protein confers resistance to streptomycin. This provides an excellent target for CRISPR/Cas9 gene editing. E. coli cells were transformed with plasmids expressing the Cas9 endonuclease and guide RNA, along with an oligonucleotide that incorporates the change to rpsL, in attempts to confer streptomycin resistance. Chemical transformation using 250 mM CaCl2 saw low transformation efficiency. Electroporation produced much higher transformation efficiencies. Both generated colonies of E. coli with the ability to grow in the presence of streptomycin, Different recovery times were also assayed. Gene editing efficiency was approximately 18% in all trials. Future work will focus on increasing gene editing efficiency.

13 EFFECT OF PARTIAL BLINDNESS ON HUNTING BEHAVIOR IN SALTICIDAE (ARANEAE: SALTICIDAE) IN A CONTROLLED ENVIRONMENT

Biology

Author(s):
Doug Sherrill, Dr. Marianne Robertson, Dr. Travis Wilcoxen

Faculty Sponsor(s):
Dr. Marianne Robertson

Milikin University

Abstract/Description:
Salticidae spiders (jumping spiders) are sight-based active predators. Salticids have four pairs of eyes – the anterior median eyes (AME), posterior median eyes (PME), anterior lateral eyes (ALE), and posterior lateral eyes (PLE). We examined the functions of each eye pair in the salticid Salticus scensicus. We conducted a control group (no eyes impaired) and five experimental groups. For four of the experimental groups, we blocked six eyes with nontoxic enamel, with each group having a different pair of eyes uncovered (AME, ALE, PLE, PME respectively). We blocked all eight eyes in the remaining experimental group. We maintained spiders individually and introduced one flightless fruit fly (Drosophila) into each arena. We recorded data until the spider caught the fly; if prey were not caught, we ended observations after 10.0 minutes. We conducted trials once every three days with each spider, for a total of eight trials per spider. For each trial, we recorded whether prey was captured. For those that captured prey, we recorded attack distance, time required to capture prey, number of tactile contacts before capture, and number of unsuccessful attempts before capture. We performed a RMANOVA for each of our data points and saw trends towards the control out-competitive the experimental groups. The eyes do play a primary role in stalking and capturing prey, and no single unaffected pair was able to compensate for loss of other eyes. Additionally, experimental spiders significantly improved over subsequent trials, suggesting that spiders were learning to compensate for the blocked eyes.
THE INFLUENCE OF UV LIGHT ON AGGREGATION, SHELTERING, AND CANNIBALISM IN THE TERRESTRIAL ISOPOD, PORCELLO LAEVIS

Biology

Author(s): Laura Nearing, Dr. Marianne Robertson, Dr. Travis Wilcoxen
Faculty Sponsor(s): Dr. Marianne Robertson

Millikin University

Abstract/Description:
Terrestrial isopods are a highly gregarious species that spend extended periods of time under shelters and in aggregates with conspecifics. This highly developed social behavior is crucial for survival in harsh climates, as isopods are known to be sensitive to changes in temperature, humidity, and brightness. It is thought that the aggregation behavior common in woodlice functions to prevent desiccation, especially when exposed to stressful environmental conditions. It has been observed that under adverse environmental conditions, terrestrial isopods may exhibit cannibalistic behavior. This study examines whether exposure to UV light increases the frequency of sheltering, aggregating, and cannibalistic behavior in Porcellio laevis. P. laevis were separated into 15 groups of 10 and exposed to UV light for a period of 90 minutes. Every 15 minutes, the number of isopods under shelters, in aggregates, and cannibalizing were recorded. A Repeated Measures ANOVA was used to analyze the number of isopods under shelters and number of isopods in aggregates, and a Chi-square test of association was used to determine if cannibalism was more frequently associated with UV light over the control of fluorescent light. The results of this study have important implications. It is crucial to understand how changes in environmental conditions affect the normal behavior of a species that plays an integral role in the soil of environments, especially with the emerging focus on the impact of climate change.

BEHAVIORAL EFFECTS OF SUB-LETHAL CYPERMETHRIN EXPOSURE ON LITHOBATES CATESBEIANUS TADPOLES

Biology

Author(s): Jacquelyn Spence, Dr. Travis Wilcoxen, Dr. Marianne Robertson
Faculty Sponsor(s): Dr. Marianne Robertson

Millikin University

Abstract/Description:
Cypermethrin is a widely used pesticide targeted at disrupting the nervous systems of insects; however, cypermethrin may also negatively impact aquatic vertebrates. We examined the effect of sub-lethal doses of this insecticide on American bullfrog tadpoles, Lithobates catesbeianus. We maintained control tadpoles (n = 20) individually in 600 ml of aged tap water. We exposed one experimental group of tadpoles (n = 20) to 0.2 ppb cypermethrin in 600 ml aged tap water and a second experimental group (n = 20) to 0.4 ppb cypermethrin in 600 ml aged tap water. We maintained cypermethrin exposure for 3 weeks. We then used focal animal sampling to collect data by making 20 min. observations twice weekly for 3 weeks. For each of the three groups, we determined the means, frequencies, and durations for six different behaviors (moving, swirling, lying on the side, touching the side of the tank, surface breathing, and feeding). We analyzed behavioral differences among the groups using a repeated-measures ANOVA. Our data analysis should indicate whether sub-lethal cypermethrin exposure affects the behavior of L. catesbeianus tadpoles.

SEROPREVALENCE OF PASTEURELLA MULTOCIDA, THE CAUSATIVE AGENT OF AVIAN CHOLERA, AMONG FREE-LIVING BIRDS IN CENTRAL ILLINOIS

Biology/Zoology

Author(s): Meredith Artime, Dr. Travis Wilcoxen
Faculty Sponsor(s): Dr. Travis Wilcoxen

Millikin University

Abstract/Description:
Wild birds are exposed to many pathogens in their natural habitats, including the bacterium Pasteurella multocida. P. multocida is the causative agent of avian cholera. Although much research has been conducted on avian cholera in waterfowl, little to none has been conducted on other birds, such as songbirds, wading birds, and raptors. Some songbirds and wading birds share habitats with waterfowl and some raptors share habitats and feed on waterfowl, which may expose them to P. multocida. We hypothesized that waterfowl would have antibodies against P. multocida at a rate much greater than other bird species due to their frequent exposure to contaminated water. We collected blood samples from 193 birds, including birds of prey, songbirds, and waterfowl, and completed enzyme-linked immunosorbent assays to determine if IgY antibodies specific to P. multocida were present. Of the 193 birds, 31 birds possessed IgY specific to avian cholera. Waterfowl had a seroprevalence of 25%, and 30.5% of wading birds were seropositive. Only two songbirds (4.5%) were positive for IgY to the pathogen. Among raptors, 13.5% tested positive for the P. multocida. The highest prevalence was in the Columbiformes (doves and pigeons), at 31.1%. Clearly there is a risk of avian cholera across taxonomic groups, however, and while waterfowl may be the most common spreader of the pathogen via their migratory behaviors, they do not appear to be the most commonly infected.
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EFFECTS OF ELEVATED SALINITY ON CUBAN TREEFROG (OSTEOPILUS SEPTENTRIONALIS) TADPOLE ALDOSTERONE LEVELS, GROWTH, AND DEVELOPMENT

Biology
Author(s):
Erin Lukens, Dr. Travis Wilcoxen

Faculty Sponsor(s):
Dr. Travis Wilcoxen

Millikin University

Abstract/Description:
Amphibian habitats are challenged with salinization due to environmental factors such as climate change, the use of road salts, and elevated sea levels. High salinity can have negative effects on the physiology and development of species living in freshwater habitats. Aldosterone is a steroid hormone that is produced by the adrenal cortex and is involved in osmotic regulation. We studied the effects of salinity on growth, development, and aldosterone levels in Cuban Treefrog tadpoles. Gosner stage, growth rates, and aldosterone levels were determined for tadpoles among three salinity treatments (150, 250, and 350 ppm) over a six-week period. Aldosterone levels were determined by an enzyme immunoassay of tadpole plasma. There was a significant effect of salinity on growth, development, and aldosterone levels. Tadpoles in the low salt group were larger, more developed, and produced the least aldosterone compared to those in the high salt group. It appears that Cuban Treefrog tadpoles have the ability to respond to high salt levels with increased aldosterone secretion; however, in order to survive high salt concentrations, trade-offs in growth and development must occur to regulate osmotic functions.

18

HABITUATION TO A TACTILE STIMULUS BY A MILLIPEDE, ORTHOPORUS TEXICOLENS (SPIROSTREPTIDA: SPIROSTREPTIDAE)

Biology
Author(s):
Isabella Newingham, Dr. Marianne Robertson

Faculty Sponsor(s):
Dr. Marianne Robertson

Millikin University

Abstract/Description:
North American millipedes, Orthoporus texicolen, are common arthropods found primarily in woodland soils. When exposed to predators, millipedes coil as a defense mechanism to protect the head and soft ventral body surface. Although there has been extensive research conducted on learning behavior in invertebrates, there is limited research addressing millipedes specifically. Thus, we examined habituation, a type of non-associative learning described as a diminished response to a repeated neutral stimulus. Millipedes have the capacity to habituate to vibrational stimuli, but habituation to tactile stimuli has not been examined. Therefore, we observed coiling in response to 25 newtons of force/ 250 kPa of pressure. We exposed control millipedes (n = 18) to the stimulus twice for 10 sec, separated by an interval of 40 minutes. We exposed experimental millipedes (n = 18) to the same vibrational stimulus for 10 seconds over the course of 10 trials separated by 2-minute intervals. We began timing each interval after responses ceased and millipedes uncoiled. For each trial, we recorded presence versus absence of a coiling to the tactile stimulus, as well as the duration of each coiling response. We analyzed control data with a paired t-test and experimental data with a repeated measures ANOVA. None of the control or experimental millipedes habituated; the millipedes continued to coil in all 10 trials. Our data analysis should indicate whether the time O. texicolen spent coiled decreased significantly over subsequent trials. This study will be able to give insight on the ability of millipedes to retain memory, and how this pertains to survival and reproductive success.

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ENHANCED HEMATOLOGICAL CONDITION IN BIRDS OF PREY UNDERGOING REHABILITATION IS INDEPENDENT OF VITAMIN SUPPLEMENTATION

Biology
Author(s):
Anthony Bryan, Jane Seitz, Jacques Nuzzo, Dr. Travis Wilcoxen

Faculty Sponsor(s):
Dr. Travis Wilcoxen

Millikin University and Illinois Raptor Center

Abstract/Description:
Antioxidants play a key role in protecting cells by inhibiting harmful oxidants, or free radicals, produced by metabolic processes. Antioxidants are especially important in vertebrates that are ill or are overcoming injury, such as birds of prey, that are taken into captivity for rehabilitation. In addition to the stress associated with injury, these animals incur the additional stress of being handled, which may drastically reduce their antioxidant capacity. In order to bring the raptors antioxidant levels into balance, a healthy diet is necessary. In many zoos and rehabilitation centers, the dietary supplement Vitahawk® is administered to boost Vitamin A, C, E, K, and B in captive birds. The objective of our study was to determine if Vitahawk® improves antioxidant and cardiovascular health in birds undergoing rehabilitation. Blood samples from birds were taken at admission and release to be used in a total antioxidant capacity (TAC) assay to determine differences between antioxidant capacity levels. Raptors receiving Vitahawk®, we found that non-Vitahawk® recipients had a 35% increase in antioxidant capacity from their time of admission to release, supporting that normal diet increases antioxidant capacity levels by itself. We did not find a significant difference between birds given Vitahawk® and those not given the supplement, suggesting that the supplemental vitamins and nutrients may not provide any additional benefit in a secure environment with an ample, consistent food source.
20

ISOTYPE SWITCHING AND SPLEEN DEVELOPMENT IN RANA CATESBEIANA

Biology (Immunology)

Author(s):
Raisa Zamacona Gonzalez, Dr. Travis Wilcoxen

Faculty Sponsor(s):
Dr. Laura Zimmerman

Millikin University

Abstract/Description:
Compared to immunity in adult frogs, little is known about immunity in tadpoles. It has been demonstrated that Rana catesbeiana tadpoles can isotype switch from IgM to IgY three weeks after exposure to an antigen. However, the exact timing of this has not been determined. The time period of isotype switching in Rana catesbeiana was studied in 90 tadpoles, in addition to the development of their spleens. We divided the tadpoles into two different groups, the control group and the immunized group. Control tadpoles received 10 μL of a 50/50 of phosphate buffer solution (PBS) and alum. Immunized tadpoles received 10-μL of 50/50 solution of 10 g/μL of keyhole limpet hemocyanin in PBS and alum. Two tadpoles from the control group and four from the immunize group were selected randomly to be sampled every three days. We discovered that the immunized group had an enlarged spleen than the control group. The antibody levels to KLH will be measured using an ELISA. These results help us in determining the period of time it takes the tadpoles take to isotype switch from IgM to IgY. This information could be used in future research to investigate factors such as stress levels, change in temperature, and change in resource availability could affect the length of time that Rana catesbeiana takes to respond to novel antigens.

21

SUB-LETHAL EFFECTS OF LEAD TOXICITY ON MULTIPLE SPECIES OF RAPTORS IN CENTRAL ILLINOIS

Biology/Zoology

Author(s):
Alyssa Kofman, Dr. Travis Wilcoxen

Faculty Sponsor(s):
Dr. Laura Zimmerman

Millikin University

Abstract/Description:
Lead toxicity in wild birds of prey has been an ongoing issue for animal conservationists both in the United States and abroad. The Illinois Raptor Center in Decatur, Illinois is just one of many rehabilitation centers throughout the world working to understand the prevalence of lead poisoning and the affects of lead toxicity in wild raptors within their specific regions. While we know that raptors can make a successful recovery from sub-lethal effects of lead poisoning, we did not yet know how much of an effect sub-lethal doses have on the birds’ overall recovery as compared to birds of prey that comes in without lead poisoning. We hypothesized that calcium levels, heterophil/lymphocyte ratios, and hematocrit levels in raptors with lead poisoning would show inhibited improvement at release over raptors without lead poisoning. Blood samples were taken from the raptors upon arrival to the IRC and again at the time of release. We determined the hematocrit levels in the blood immediately after blood sampling, used a colorimetric assay to determine levels of calcium in the blood, and completed counts of heterophils and lymphocytes from blood smears via microscope. We found evidence that although birds of prey with and without sub-lethal levels of lead in their blood at the time of admission to the IRC are able to be released back into the wild, the raptors without lead toxicity are show significantly greater physiological profiles than those suffering with lead toxicity at the time of arrival to the IRC.

22

3D PRINTED MICROFLUIDICS FOR HANDS-ON UNDERGRADUATE LABORATORY EXPERIMENTS

Chemistry

Author(s):
Matthew Vangunten, Jacob Hamilton

Faculty Sponsor(s):
Dr. Kyle Knust

Millikin University

Abstract/Description:
Educational experiments utilizing microfluidic devices are often restricted to well-equipped universities because traditional fabrication techniques require specialized and expensive equipment. We demonstrate stereolithography 3D printed microfluidic devices are well suited for introducing hands-on microfluidic experiments to undergraduate laboratories. A custom, watertight microfluidic device can be designed and printed within hours for low-cost, thus making 3D printed microfluidics ideal for teaching. We show 3D printed microfluidics can be reused and made sufficiently transparent for experiment visualization with naked eye or microscope. Using the 3D printed microfluidics, we demonstrate microfluidic principles by showing laminar flow, parabolic flow, and diffusional mixing. Microchip gel electrophoresis is also performed to highlight the low reagent requirements of microfluidics.

23

PREPARING A HOME-BUILT CAPILLARY ELECTROPHORESIS INSTRUMENT IN ADVANCED INSTRUMENTAL ANALYSIS

Chemistry

Author(s):
Matthew Vangunten, Jacob Hamilton

Faculty Sponsor(s):
Dr. Kyle Knust

Millikin University

Abstract/Description:
A home-built capillary electrophoresis instrument was assembled for undergraduate laboratory applications using a high-voltage power supply, UV-Vis detector, and integrator for data readout. A laser cutter and solvent welding were employed to prepare a custom acrylic box for the high-voltage circuitry and sample cell. With capillary electrophoresis separations routinely requiring ,20,000 V, for safety, a limit switch was wired into the circuit to kill power when the instrument door is open. Additionally, all exposed wiring and electrical connections were covered with insulating heat shrink. A ruled guide rail was integrated into our
QUALITY CONTROL ANALYSIS OF KEY CHARACTERISTICS FOUND IN DECATUR BREW WORKS' 101 NEW ENGLAND IPA AND KNOEISESSER LAGER
Chemistry
Author(s): Andie Schlagel, Dalton Glasco, Han Do, Matthew Frank
Faculty Sponsor(s): Dr. Kyle Knust

ANALYSIS OF POTENTIALLY SUBSTANDARD ACETAMINOPHEN CONTAINING PHARMACEUTICALS BY HIGH PERFORMANCE LIQUID CHROMATOGRAPHY
Chemistry
Author(s): Andie Schlagel, Dr. Kyle Knust
of this sequence with alterations at the C-terminus, N-terminus and average amino acid composition as supported by previous in silico work. Synthesis and analysis of these permutation of GGNS peptides against MCF-7 breast cancer cells can be used to further the study of peptides as a potential future cancer treatment and will act as the underlying focus of this study. By researching this topic, the field of biochemistry surrounding peptides and their importance in all biological processes will be reinforced and will hopefully lead to future alternatives to current philosophies surrounding treating cancer.

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### 29

**EXPLORING THE VIABILITY OF METAL NANOPARTICLES AS CANCER-KILLING AGENTS**

**Chemistry**

**Author(s):** Rachel Muyembahazi, Jennifer Schroeder, Dr. Paris Barnes

**Faculty Sponsor(s):** Dr. Paris Barnes

**Millikin University**

**Abstract/Description:**

Scientists have conducted different studies to examine the toxicity of metal nanoparticles on breast cancer cells. X-ray diffraction, energy dispersive X-ray spectroscopy, and electron microscopy were used to analyze the composition and the structure of metal nanoparticles (aluminum, copper, nickel, and silver) prior to use. Metal nanoparticles suspensions were prepared with concentrations between 0-15 ppm using a 1% hydroxymethylpropylcellulose solution. The concentrations of the nanoparticle suspensions were verified using atomic absorption spectroscopy. The cancer cells were treated with microliter amounts of the nanoparticle suspensions, then were allowed to incubate for a set time. Cancer cell viability was measured using a colorimetric assay. This poster will present the results of this continuing work.

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### 30

**COMPARING NATIONAL FOOTBALL LEAGUE (NFL) COMBINE PERFORMANCE TO DRAFT POSITION FOR THE 2017 NFL DRAFT**

**Mathematics**

**Author(s):** A. Hartman, P. Chrysosferidis, G.A. Ryan, R. Herron, S. Bishop, C. Katica

**Faculty Sponsor(s):** Dr. James Rauff

**Millikin University, Georgia Southern University, University of Monteval and Pacific Lutheran University**

**Abstract/Description:**

The National Football League (NFL) conducts an annual combine to assess athletic ability in a variety of tests in preparation for the draft. PURPOSE: The purpose was to normalize performance results of the athletes invited to the 2017 NFL Combine and compare to Draft Round to determine if a correlation existed between combine performance and draft status. METHODS: Data from six tests (40 yard sprint; 225 pound bench press repetitions; vertical jump; broad jump; three-cone drill; and 20 yard shuttle) of 326 athletes were analyzed. Data from completed tests were normalized (Z-scores) and averaged to calculate an average Z-score value for each athlete. A Spearman-rho correlation was run between average Z-scores and Draft Round in the 2017 NFL Draft. RESULTS: A weak negative correlation (r = -0.240, p < 0.001) existed between average Z-score in the Combine and Draft Round. The correlation was stronger among Linebacker (r = -0.477, p = 0.039), Wide Receiver (r = -0.478, p = 0.039), Tight End (r = -0.477, p = 0.039), and Offensive Line (r = -0.418, p = 0.004). No significant correlation existed for Quarterback (p = 0.472), Running Back (p = 0.185), Defensive Back (p = 0.167), Defensive Line (p = 0.210) or Specialist (p = 0.858). CONCLUSION: The findings suggest that overall NFL Combine performance is related to NFL Draft order, especially when normalized to one’s specific position. These findings support the use of normalized Z-scores to supplement team and scout assessments. However, due to the weak overall correlation, it is possible that the NFL and teams should reconsider what is measured at the NFL Combine.
31

PATTERN PACKING IN WORDS
Mathematics

Author(s):
Julia Krull, Eric Redmon, Andrew Reimer-Berg, Dr. Lara Pudwell

Faculty Sponsor(s):
Dr. Joe Stickles

Millikin University, Lewis University, Eastern Mennonite University and Valparaiso University

Abstract/Description:
A word is an ordered list of numbers. Specifically, a permutation is a word without repeated letters, denoted \( \pi \). A pattern is a word we look for within other words, denoted with \( \rho \). The superscript \( r \) is used to represent the reverse of a word. In general, permutations are studied in terms of pattern avoidance, that is, which words avoid which patterns. Researchers have discovered several orderly ways to count pattern avoiding words of the form \( \pi^n \) and \( \pi^n r \). Instead of avoiding patterns, this research studies pattern packing; that is, identifying words with as many copies of a pattern as possible. This idea was first studied by focusing on packing patterns into general words. This research's focus is on packing words of the form \( \pi^n \) and \( \pi^n r \). In particular, given a pattern \( \rho \), this work considers how many times it is possible to pack \( \rho \) into words of these forms, what the \( \rho \)-optimal words look like, and how many \( \rho \)-optimal words exist for a given length of \( \pi \).

32

ANTI-VACCINATION MOVEMENT
Nursing

Author(s):
Angela Thunder, Katlyn Niepoetter

Faculty Sponsor(s):
Julie Kennedy, M.S.N.

Millikin University

Abstract/Description:
The Anti-vaccination Movement has caused an increasingly growing concern throughout the world, in particularly the United States, for many years. As a result of this movement, childhood diseases that were once almost eradicated are becoming more common again. This poster will discuss the common misconceptions in which present-day parents justify their belief that their children should not be vaccinated, while also showing research to disprove these reasons. Our sources of information are gathered from the research bases of CINAHL and ProQuest Nursing & Allied Health Source. Throughout our research we have learned that most misconceptions have derived from anti-vaccination websites and books that are biased, rather than from scientific studies and evidenced-based research. Although many of these misconceptions have been disproved, such as autism and other vaccination-caused diseases, many of the anti-vaxxers have become more aggressive in promoting the anti-vaccination movement.

33

POSTPARTUM HEMORRHAGE: RISK FACTORS
Nursing

Author(s):
Maddie Andrychowski, Sarah Houran

Faculty Sponsor(s):
Julie Kennedy, M.S.N.

Millikin University

Abstract/Description:
Background: The aim of this project is to compare the effects of skin-to-skin contact between a mother and a critically ill preterm neonate to that of a healthy full-term neonate. The significance of the current study is to educate health care professionals on the many benefits of skin-to-skin contact for newborns. The study will discuss the implementation of kangaroo mother care in the neonatal intensive care unit (NICU) and postpartum unit to minimize infant deaths.

Methods: A literature review was conducted using CINAHL Complete. Several search terms were used and some include postpartum hemorrhage risk factors, postpartum hemorrhage AND high risk, postpartum OR postnatal AND hemorrhage AND risk factors, postpartum risk factors AND interventions. Using evidenced-based articles with statistics and analyses was part of our in-depth search to finding contributing factors to hemorrhage.

Results: The results show there are several risk factors that put women at medium-high risk for postpartum hemorrhage. The factors determined during pregnancy and birth that may indicate medium-high risk. It also will show how the obstetric floors prepare these emergencies.

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EFFECTS OF KANGAROO CARE ON THE NEONATE
Nursing

Author(s):
Kelsey Pierson, Carly Kirk

Faculty Sponsor(s):
Julie Kennedy, M.S.N.

Millikin University

Abstract/Description:
Background: The aim of this project is to compare the effects of skin-to-skin contact between a mother and a critically ill preterm neonate to that of a healthy full-term neonate. The significance of the current study is to educate health care professionals on the many benefits of skin-to-skin contact for newborns. Additional importance of the study is to help promote the implementation of kangaroo mother care in the neonatal intensive care unit (NICU) and postpartum unit to minimize infant deaths.

Methods: A literature review was conducted using the databases: CINHAL and ProQuest. Search terms used included: “kangaroo care or skin to skin”, “preterm infants or premature infants” and “benefits or advantages or positive effect”. After including exclusion and inclusion criteria, we selected eight articles that support our research question.

Review of Evidence: The majority of the research articles suggested that the practice of kangaroo care provides mutual physiological benefits for both the ill preterm infant and the healthy full-term infant. Such benefits include: parent-infant attachment, effective breastfeeding, and stabilization of body temperature and blood glucose levels.
Conclusion: Based on the research findings retrieved from the articles, we found that there are little to no significant difference between the positive effects of kangaroo mother care on a preterm newborn versus a full-term newborn. Additional research must be conducted to help healthcare professionals and parents of the neonate understand the reasons for such beneficial effects.

Epidural Analgesia: Risks to Mother and Baby During Labor

Nursing

Author(s): Yvette Musanganya, Cali Melton

Faculty Sponsor(s): Julie Kennedy, M.S.N.

Millikin University

Abstract/Description: The purpose of this research is to look at issues or risks associated with Epidural analgesia in newborn and mother during labor and postpartum.

Background: While labor and delivery (L&D) are natural processes, we have seen a big rise in the use of Epidural analgesia in controlling pain during L&D. Epidural analgesia usage has grown in the western society and this has been associated with some detrimental effects. In this study we are going to review risks that are associated with the use of Epidural while hoping that the society is going to change its practice in this usage and get the public informed about the advantages of letting the body run its course.

Methods: We searched in Cinahl and Pubmed. Keywords included Effects of Epidural in labor, Epidural and labor or birth. Our initial search yielded 1900 results. After employing our inclusion and exclusion criteria we found 10 articles of what we were looking for.

Results: Three articles show that Epidural is linked to C-Section. Two articles show that epidural is linked to breastfeeding issues including both early onset of breastfeeding and continuing breastfeeding. Two articles show that epidural is linked to instrumental childbirth, one article shows that epidural is linked to newborn admission to NICU/health issues, and one article show that epidural is linked to operative vaginal delivery.

Conclusion: We need to reduce and avoid the use of epidural analgesia because it seems to be linked to a lot of detrimental effects on the mother and the newborn.

Evidenced-Based Clinical Guide for Sugammadex: A Quality Improvement & Cost Reduction Strategy

Nursing

Author(s): Angelina Thomas, Kristi Stice, Dana Flatley, John Blakeman, Dr. Jo Carter

Faculty Sponsor(s): Dr. Jo Carter

Millikin University

Abstract/Description: Background: Sugammadex (Bridion ®) is an expensive neuromuscular blocking (NMB) reversal agent that offers significant benefits over an alternative, neostigmine. Misappropriation of this unrestricted drug negatively impacts the pharmacy budget.

Purpose: Address key drivers for change for the use of sugammadex to reduce cost, promote the appropriate use of NMB reversal agents, and reduce pharmaceutical waste.

Methods: An evidence-based clinical guide for sugammadex was introduced to the anesthesia suites, in which compliance was evaluated including prescribed interventions. Misappropriation was defined as: using an inappropriate dose of sugammadex, using a vial of sugammadex larger than what was needed/used, and using sugammadex without documenting a train-of-four count.

Results: Compliance with vial selection increased from 63.98% to 88.94% for pre-to post-intervention, respectively, X² (1, n = 428) = 37.219, p = .000. There was a statistically significant increase in compliance with dosing sugammadex from 63.98% to 76.5% from pre- and post-intervention, respectively, X² (1, N = 428) = 8.031, p = .005. Compliance with clinical indications was similar (p = .943) from pre- to post-intervention. Compliance with 500 mg vial selection increased 15.8% to 29.2% from pre- and post-intervention X² (1, n = 100) = 2.121, p = .145, respectively, narrowing estimated cost-saving from $3,988 for pre- to $600 for post-intervention. There was also revealed a deficit in charting all appropriate indices.

Futile Care: Nursing Outlook

Nursing

Author(s): Lisa Brackett, Morgan Damery

Faculty Sponsor(s): Julie Kennedy, M.S.N.

Millikin University

Abstract/Description: Background: Futile care is offered as a last resort with no reasonable hope or chance of survival rates increasing. Physicians make the ultimate decision based off of experience, knowledge, family wishes and input from nurses and other members of the healthcare team. The issue with futile care is we as healthcare members seem to lack empathy, compassion, and ethical standards if we do not offer it. The amount of futile care given in the United States accounts for the increasing costs related to care provided and not being reimbursed. Age plays a big role as well related to healthcare members wanting to miraculously cure the 5-year-old with terminal cancer. Yet, futile care is continuously performed with no chance of changing the patient’s outcome.

Methods: We searched with Google Scholar, CINAHL, PubMed, ProQuest Nursing and Allied Health Source. Searches we conducted between 1 February 2018- 6 February 2018.

Results: We were able to obtain twelve articles. Most of the articles were quantitative studies that were conducted in the USA.

Conclusion: The conclusion that we have drawn is that we, as healthcare workers, must provide ethically bound treatment to each patient regardless of their age, gender, ethnicity, race, and financial ability. The duty to treat is also a responsibility of all healthcare workers, but there are exceptions such as a DNR or the patient having a power of attorney for healthcare.
MODE OF DELIVERY IMPACT ON INFANT MICROBIOME

Nursing

Author(s):
Sydney Garcia, Jessica Wernig

Faculty Sponsor(s):
Julie Kennedy, M.S.N.

Millikin University

Abstract/Description:
Background: The purpose of this study is to determine if infants born vaginally have a more diverse microbiome than those born via cesarean and the impact on long-term health. A diverse microbiome of the intestines positively influences endocrine, immune, and digestive function.

Methods: We searched CINAHL and ProQuest to find our articles. We limited our research by utilizing articles from 2010 to current. The search terms included "infant microbiome", "cesarean section", "vaginal delivery", "modes of delivery", and "microbiome".

Results: Our articles concluded that babies born naturally have a more diverse and rich microbiome in comparison to babies born via cesarean section.

Conclusions: We found that infants born vaginally have an increase in lactobacillus and streptococcus in their gut microbiome, which is a result of passing through the mothers' birth canal. Decreased levels of these natural vaginal and perineal microorganisms are linked to pathological outcomes. Infants that must be surgically born, due to medical complications, can use vertical transfer of the mothers' vaginal flora to obtain these necessary bacteria.

ORAL HEALTH PROMOTION DURING PREGNANCY

Nursing

Author(s):
Heather Wiegand

Faculty Sponsor(s):
Dr. Amy Yeates

Millikin University

Abstract/Description:
Improper oral care by a woman during the prenatal period can have long-term consequences for both mother and baby. Poor oral health is referred to as a "silent epidemic" and has been implicated in many chronic conditions, including, but not limited to, heart disease, stroke, asthma, and diabetes. This research aims to increase oral health in pregnant women and questions: Will providing staff education regarding oral health screening and promotion at a federally qualified health center reinforce the importance of oral health screening and promotion during prenatal visits?

Research was conducted at a Midwestern hospital with midwives and obstetric nurses and involved a pre-test, a presentation regarding oral health promotion, and a post-test administered two weeks later. Results showed an increase in knowledge of screening and oral health promotion, using a comparison of the pre- and post-tests. A pregnant woman's oral health can be influenced by the prenatal care provider, but the patient needs to be collaboratively involved. The patient should practice healthy behaviors not only during the preconceptual, antenatal and postpartum phases, but also throughout her lifespan.

HOW ACCURATELY DOES THE NIHSS DETERMINE STROKE PATIENT IMPAIRMENT IN THE ACUTE SETTING

Nursing

Author(s):
Alice Bernard, Cody Gray

Faculty Sponsor(s):
Julie Kennedy, M.S.N.

Millikin University

Abstract/Description:
The purpose of this research is to determine how accurately the National Institutes of Health Stroke Scale (NIHSS) determines patient impairment in the acute setting. Currently, the NIHSS is the standard for assessment of a stroke patient's neurological and musculoskeletal level of function following a stroke. Using the Cumulative Index of Nursing and Allied Health Literature (CINAHL) we found 10 articles in support of the use of the NIHSS in the acute setting. The inclusion criteria were: Patient Outcome and NIHSS. We used this information to determine how accurately the NIHSS can be used to assess the severity of patient symptoms in the acute setting to promote an individualized plan of care.
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REDUCING HEALTH RISKS FOR COLLEGIATE FOOTBALL PLAYERS
Nursing
Author(s): Matthew Thompson
Faculty Sponsor(s): Dr. Sheila Jesek-Hale
Millikin University
Abstract/Description: The purpose of this study was to identify how collegiate football players respond to education regarding the health risks of excessive weight gain. This study recruited football players from a Division III university. Participants were asked to complete a general health survey and three-day food journal prior to attending the health risks education session. However, of the nine participants who agreed to participate, none attended the educational meeting. Nola Pender’s Health Promotion Model was used to identify the attitudes and behaviors of collegiate football players and to infer reasons why collegiate football players may not want to participate in a study focusing on changing dietary habits. Lack of positive peer pressure and the timing of the study are believed to have been the biggest barriers for participation.

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SEXUALLY TRANSMITTED INFECTIONS IN THE AGING ADULT: THE NURSE’S ROLE
Nursing
Author(s): Haley Danielle Mettendorf
Faculty Sponsor(s): Dr. Mary Jane Linton
Millikin University
Abstract/Description: Research has shown that individuals in the aging population remain sexually active until approximately 70-years of age and beyond. Sexually transmitted infections not only affect the younger generation, but occur in the aging adult population as well. The goal of this project was to increase awareness of sexual activity and associated STIs in adults’ 50-years of age and older in addition to educating nurses regarding the importance of a professional approach related to sexual health. An extensive literature review was conducted using the Cumulative Index to Nursing and Allied Health Literature (CINAHL) and ProQuest Nursing Allied Health Source academic search portals. The literature review revealed a variety of infections that are transmissible during sexual contact among older adults. Common causes of STIs include bacteria, viral, and parasitic infections. Watson’s Theory of Caring provided the organizing theoretical framework for this project. Sexually transmitted infections may lead to debilitating social factors, and symptoms may go unrecognized and remain transmittable if not treated. The topic of sexuality may cause health care professionals to feel uncomfortable. Nurses must support safe sexual activities among older adults in retirement communities by integrating Watson’s Theory of Caring into practice. Professional nurses must display a professional attitude of acceptance to provide an environment for patients to feel comfortable to approach them with questions related to sexuality and the risk for STIs. The nurse is in a key position to have a positive impact on the attitude of healthcare professionals through education to support residents or patients to remain sexually active while remaining free of STIs.

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BEST PRACTICES TO REDUCE DELIRIUM IN ICU PATIENTS
Nursing
Author(s): Alexis Stouffe, Abigail Brooks
Faculty Sponsor(s): Julie Kennedy, M.S.N.
Millikin University
Abstract/Description: Purpose: The purpose of this literature review is to explore the best interventions for reducing acute delirium in critically ill adult intensive care unit patients.
Background: Acute delirium is an alteration in cognitive function that is often overlooked in the intensive care unit population. Delirium can lead to severe complications and poor patient outcomes. In order to avoid these severe complications and poor patient outcomes, the underlying issues of acute delirium needs to be addressed.
Methods: We searched various databases through Staley Library such as: PubMed, CINAHL, and ProQuest. To further narrow our results we added limitations of terms from 2009-2019 as well as the following terms: “acute delirium”, “acute confusion”, “adults”, “ICU”, “critical care”, “interventions” and “strategies”. In addition, we have reviewed the P.A.D guidelines that have been implemented at Memorial Medical Center in Springfield, IL on the Medical Intensive Care Unit.
Results: At this point in our research, we have reviewed multiple articles that have addressed the complications of acute delirium in adult ICU patients as well as pharmacologic and nonpharmacological interventions.
Conclusions: Our research showed pharmacologic and non-pharmacological interventions to prevent acute delirium in adult ICU patients. However, further research is needed to explore the best practices to reduce acute delirium in this specific population.

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BEHAVIORAL HEALTH: RECOGNITION AND PREVENTION OF VIOLENCE IN THE EMERGENCY DEPARTMENT
Nursing
Author(s): Shannon Brinkoetter
Faculty Sponsor(s): Dr. Angela Bentley
Millikin University
Abstract/Description: Patients with psychiatric conditions often seek care in the emergency department (ED) because of the lack of availability of behavioral health facilities, therefore the ED is the only place these patients can go in desperate situations. Agitation is common among the behavioral health population and the lack of effective agitation assessment tools for use in the ED is a problem. The overall purpose of this education project...
is to provide education for the ED nurses regarding appropriate care of the behavioral health patient and use of the Agitation Severity Scale to prevent violent outbreaks in the behavioral health population.

Method: An education presentation was adjusted because of time constraints in the ED. The ED nurses were educated about the presence of violence, presence of behavioral health population, and the Agitation Severity Scale. The ED nurses completed a pretest and posttest to evaluate the knowledge gained from the presentation.

Results: Altogether, there were 4 participants who completed the pre and post-test. The results showed there was improvement in scores from pre- to post-test. The average number of correct answers on the pretest was 1%. The average number of correct answers on the post-test was 5%.

Conclusion: Post-test scores revealed improvement in knowledge on all questions except the questions related to the Agitation Severity Scale and de-escalation techniques. While the nurses overall knowledge regarding care for the behavioral health patient improved, there was no improvement in the ED nurse's knowledge about the Agitation Severity Scale.

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THE EFFECT OF USING SKIN ASSESSMENT TOOLS ON PREVENTING PRESSURE INJURIES
Nursing
Author(s):
Samiha Thapa, Courtney Fraker
Faculty Sponsor(s):
Julie Kennedy, M.S.N.
Millikin University
Abstract/Description:
The prevalence of pressure injuries in the United States are extremely high, leaving millions affected and thousands dying from complications that arise due to this. This evidence-based research project aims to analyze adult patients at risk for pressure injury development and rates/prevalence in the hospital setting through the use of standardized risk assessment tools. The three main tools we have found in use are the Braden, Norton, and the Waterlow scale. A literature review was conducted using CINAHL, PubMed, NDNQI, and AHRQ. Our research criteria included the primary terms pressure injury, pressure ulcer, pressure injury prevention. Secondary search terms used were assessment tools, standardized tools, best practice, strategies, and interventions. We limited our search by setting the publication date years to 2010-2018, geographic subset to the United States, and the journal subset to Nursing. Research shows that it is better to overestimate the risk of developing a pressure injury and to perform the necessary preventative interventions. We also discovered that using different tools did not yield different interventional decisions and called for the same treatment. There is more need to develop the implementation of factors such as medication and nutrition to patients in order to even further implement interventions to decrease the risk of pressure injury development. Due to overestimating the risk of development, there is a possibility that the necessity of pressure injuries prevention and care may lose its importance in the inpatient hospital setting.

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VACCINATIONS: DECREASING PREVENTABLE DISEASES
Nursing
Author(s):
Autumn Meyer, Nicholas Cravatta
Faculty Sponsor(s):
Julie Kennedy, M.S.N.
Millikin University
Abstract/Description:
The increase of the Anti-vaccination movement has led to a decreased coverage of children's vaccinations across the United States. There are numerous diseases that have affected many people around the world. With the creation and research of vaccinations, we have been able to significantly reduce the number of diseases and their communicability, as well as their mortality. But with untrue science and the lack of research of the side effects and health benefits of vaccinations by many people, the incidence of hospitalized pediatric patients with preventable diseases has been increasing in recent years. The purpose of this exploration is to provide information on the decreasing vaccination coverage in pediatric patients. Our research has been derived from ProQuest, CINHAL, and PubMed. The goal of the research exploration is to provide information on the coverage of vaccinations in pediatric patients.
Key Words: Pediatrics, Vaccinations, Anti-Vaccinations, preventable diseases
Abstract/Description:
The most common reason for seeking health care in all age groups is pain (Cohen et al., 2007). Chronic pain is a significant problem, as it affects 20 to 35 percent of children and adolescents worldwide (King et al., 2011). Chronic pain in children is a serious health problem and can cause significant pain-related disabilities. Chronic pain in children not only affects the children, it affects their caregivers as well. The management of chronic pain in children elicits direct and indirect costs, from seeking healthcare to wages lost as a result of taking time off work to provide care for the child (Ho et al., 2008).

Nurses are important members of the health care team with regards to aiding children and their families in managing the negative consequences of chronic pain (Forgeron & Stinson, 2014). The Adolescent Pediatric Pain Tool is a pain assessment tool which is used to assess pain in pediatric patients. The APPT is composed of three independent parts, which include a body outline diagram (BOD) with a back and front view of the body, a word graphic rating scale (WGRS), and a list of 67 pain quality descriptors (Fernandes et al., 2014). The aim of this poster is to provide insight regarding the characteristics of how children with chronic pain express their pain and discuss the use of the Adolescent Pediatric Pain Tool (APPT) in pediatric patients experiencing chronic pain.
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CONSTRAINING THE DARK MATTER MASS PROFILES OF NEARBY ELLIPTICAL GALAXIES
Physics and Astronomy
Author(s): Nawaj KC, Justin Craig, Dr. Casey Watson
Faculty Sponsor(s): Dr. Casey Watson

Abstract/Description:
Using velocity dispersion data, we constrain the Burkert dark matter (DM) mass profiles of 15 nearby elliptical galaxies observed in the MASSIVE survey out to \( R_{200} / R_{\text{eff}} > 1.5 \), where \( R_{\text{eff}} \) is the effective radius of a galaxy, which contains 50% of the light it produces. We show that the best-fit values of the DM core radius and core density parameters are strongly correlated with \( R_{\text{eff}} \). We further show that similar \( R_{\text{eff}} \) correlations extend to multiple galaxy types over many orders of magnitude in galaxy shape, size, mass, and luminosity.

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EXPERIMENTAL AND MATHEMATICAL ANALYSIS OF A MAGNETICALLY ASSISTED GENERATOR (MAG)
Physics and Entrepreneurship
Author(s): Mason Bruce, George Coulthard, Delphine Iragena, Dominic Marco, Whitley Sapp, Mathew Schmidt, Connor Sphar, Marshall Youngblood
Faculty Sponsor(s): Dr. Casey Watson

Abstract/Description:
We test a magnetically assisted generator (MAG), involving a series of permanent magnets of alternating polarity that act in concert with a pair of springs and a flywheel. We find that the potential energy stored in the magnetic fields of the system is optimally converted into rotational energy when the MAG achieves resonant oscillations. The resonance condition changes depending on the number and electrical properties of the (conventional) generator(s) we attach to the MAG. For the best one-generator case we have examined to date, we find that the output power of the attached generator exceeds the input power delivered to the MAG by over 40% for input power values ranging from 145-155 Watts.

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HUMAN TRAFFICKING TASK FORCES IN THE US: OVERLAPPING JURISDICTIONS AND SHIFTING TYPOLOGIES
Political Science
Author(s): Julisa Sierra, Dr. Laura Dean
Faculty Sponsor(s): Dr. Laura Dean

Abstract/Description:
This poster focuses on the development and collaborations of anti-trafficking institutions established to combat human trafficking around the United States (US). We formulated a unique database mapping over 200 human trafficking task forces, coalitions, working groups and/or commissions throughout all 50 states and Puerto Rico at different levels of governance from state, to region, county, and city. Our research question seeks to determine the origin, scope, and variation of this anti-trafficking institution in the United States. We created a typology of human trafficking task forces to show this variation, the overlapping distribution of government grants, and the impetus for the task forces. We determined that there were seven different types of human trafficking task forces in the US from the grassroots level to those created by the Department of Justice. We found that some task forces do not serve all victims and focus on sex trafficking and or child victims reaffirming the deserving and undeserving victim dichotomy. We also found shifting typologies as some task forces were created under one auspice and then transformed to another.

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MODEL ILLINOIS GOVERNMENT: THE IMPORTANCE OF PERFORMANCE LEARNING IN POLITICAL SCIENCE
Political Science
Author(s): Sabrina Leblanc
Faculty Sponsor(s): Amber Lusvardi

Abstract/Description:
Model Illinois Government is a staple of performance learning for not only Political Science students, but any student wishing to improve their public speaking and research skills while also having fun and learning to exercise their democratic citizenship. The research shown has been collected from students within the organization, both past and present, and tells of their experience and growth from being able to participate in this opportunity for performance learning.
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University Commons, Level Three
Bob & Debi Johnston Banquet Rooms

Poster Awards
University Commons, Level One
Doug & Diane Oberhelman
Center for Leadership Performance
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