

The Utica College Student Conference for Research, Professional Activities, and Creative Arts

Wednesday, April 17, 2019

Library Concourse/Utica College Campus

Schedule of Events

- 2:00 **Welcoming remarks – Dr. Alyssa Thomas, Co-Chair Student
Conference Committee**
- 2:00 - 3:15 **Poster Presentations & Refreshments – Library Concourse**
- 3:15 - 3:30 **Oral Presentation set-up**
- 3:30 - 5:15 **Concurrent Oral Presentations:**
- **Session A: Macfarlane Auditorium (DePerno Hall)**
 - **Session B: Thurston Auditorium (Thurston Hall)**
 - **Session C: Gordon 261**
 - **Session D: Gordon 262**
 - **Session E: Gordon 271**
 - **Session F: Gordon 261**

POSTER SESSION: 2:00 PM – Library Concourse

Enseignement des Langues Étrangères en France et aux États-Unis (The Teaching of Foreign Languages in France and in the United States)

- Alana Wielgosz

Terrestrial Phase Tiger Salamanders Have Increased Visual Acuity Compared to Aquatic Phase Tiger Salamanders

- Ashley Rohacek

Exploring the CRAG: Strong HI Absorption in the CGM of ALFALFA Galaxies

- Chelsey McMichael

Exploring the CRAG: The Missing CGM of the ALFALFA Galaxies

- Liam Patterson and Chelsey McMichael

The History of Child Life Specialists in Chicago

- Cassidy Krenzer

Geochemical Study of Likely Cambrian or Ordovician Age Rocks of The Avery Brook Formation and an Unnamed Tonalite Near Caucomgomoc Lake, Northern Maine

- Enock Bunyon

Relationship of Diatom Size with Dust and Temperature During the Last Glacial Period in the Southern Ocean

- Erica Hulbert

POSTER SESSION: 2:00 PM – Library Concourse

Synthesis of Novel Auxiliary Molecules for Stereospecific Peptide Ligation

- Emilee Stevens

The Effect of Male Experience on Female Rejection Behavior in House Mice (*Mus musculus*)

- Jennifer Pollic

The roar within a squeak: variation in female mouse vocalizations in response to different males

- Skylar Harwick

Exploring Green Chemistry Methodologies in an Analytical Teaching Laboratory

- Francesca Milazzo

Exploring the Mechanochemical Synthesis of Metal Ammine Chlorides

- Kaitlin Mahardy and Christa Pham

Growth and development of African Clawed Frog (*Xenopus laevis*) larvae reared under different intensities of LED light at night

- Jennifer Liu and Danielle Haasbeek

SESSION A: Macfarlane Auditorium

Moderator: Elizabeth Threadgill, Assistant Professor of English

3:30 - 3:45: Utica College Student-Run Pro Bono Health Services

- Evan Priest, Amanda Lane, Shannon Fillmore, Tyler Wenzel, Jordan Noga, and Gianna Cavalier

3:45 - 4:00: The Effects of Blood Flow Restriction Training on Strength, Hypertrophy, and Function in Older Adults: A Systematic Review

- Richard Spinella, Derrick Sekuterski, Thomas Jalowiec, and Daniel Clark

4:00 - 4:15: Outcomes following LSVT BIG® on Balance, Mobility, and Function in an Individual with Idiopathic Normal Pressure Hydrocephalus: A Case Report

- Gianna Cavalier, Shannon Fillmore, Holly Franke, Marissa Hajec, and Anthony Thomas

4:15 - 4:30: Social Media and Independent Artists

- Tiffany Simmons

4:30 - 4:45: Behavioral Implications of Racial Tension Within a YouTube Comment Thread

- Cara Patterson

4:45 - 5:00: Sexual Assault and Twitter

- Kaitlyn Tambasco

5:00 - 5:15: The Implementation of Active Shooter Self Defense in the College Setting

- Sara Gribanoff and Rebecca Bruce

SESSION B: Thurston Auditorium

Moderator: Jun Kwon, Assistant Professor of Government and Politics

3:30 - 3:45: China & Vietnam: A Comparative Study of State Politics and the Catholic Church

- Hyesung Jang

3:45 - 4:00: New York State Recidivism

- Alexa Pedersen

4:00 - 4:15: Official Corruption

- Xinyi Wang

4:15 - 4:30: Money Laundering Issue in China and U.S.

- Zewei Zheng

4:30 - 4:45: Bribery compare between China and The United States

- Hang Pan

4:45 - 5:00: Insurance Fraud Issues Between China and American

- Rongshan Cai

SESSION C: Gordon 261

Moderator: Sarah Keesom, Assistant Professor of Biology

3:30 - 3:45: Investigating the Genetic Relationship Between Geographically Isolated Populations of *Physa acuta* in New York State

- Madison Burnham and Anthony DiMambro

3:45 - 4:00: Effects of *Pseudomonas uticensis* on Growth and Germination Rate of *Arabidopsis thaliana*

- Tommy Ciccolella

4:00 - 4:15: Analysis of Amylase Production in *Pseudomonas uticensis*

- Sarah Mirza

4:15 - 4:30: Effects of Carbon Source on Alginate Biosynthesis and Biofilm Adhesion in the Melanogenic Bacterium, *Pseudomonas uticensis*

- Evan Vescio, Jenn A. Liu, and Sarah F. Mirza

4:30 - 4:45: Effects of Copper on Melanin Production and Growth in *Pseudomonas uticensis*

- Ahmedina Mehmedovic and Sania Safdar

SESSION D: Gordon 262

Moderator: Alyssa Thomas, Associate Professor of Chemistry

3:30 - 3:45: PVP stabilized Gold Nanoparticles: Synthesis and UV-Vis Analysis

- Olivia Harwick

3:45 - 4:00: Synthesis of Gold Nanoparticles using Banana Peel Extract (BPE)

- Bridget Hogan

4:00 - 4:15: Gold Nanorod Synthesis

- Alayna Cormier

4:15 - 4:30: Is nanoparticle size dependent on the ratio of tetrachloroauric (III) acid to sodium citrate?

- Lauren Impicciatore

4:30 - 4:45: Effects of Reducing Agent Concentration on the Size of Gold Nanoparticles

- Emilee Stevens

SESSION E: Gordon 271

Moderator: Steven Specht, Professor of Psychology

3:30 - 3:45: A Systematic Review of Treating Breast Cancer Related Pain and Fatigue with Aquatic Therapy

- Melissa Sayles Melissa Sayles, Karsten Barbagelata, Jacqueline Eadi and Marissa McNamara

3:45 - 4:00: The Cost Effectiveness and Utilization of Physical Therapy for Low Back Pain: A Systematic Review

- Lauren Bachner Alice Hamilton, Evan Priest, Pat Shea, and Tyler Wenzel

4:00 - 4:15: ACL Injury Risk Factor Reduction in Male Athletes: A Systematic Review

- Tom Woznica Aric Freischlag, Jennifer Arts, Connor Passalacqua, and Keri Berkowitz

4:15 - 4:30: An Investigation of the Relationship Between Attachment Style and Grief

- Shannon Cool

4:30 - 4:45: Ordinal Assessment of Human Capabilities

- JoVina Taylor

4:45 - 5:00: A Growing American Crisis: The Opioid Epidemic

- Margaret Reid

SESSION F: Gordon 272

Moderator: Brad Emmons, Associate Professor of Mathematics

3:30 - 3:45: Who Will Survive in America (Novel Excerpt)

- Devan Rodriguez

3:45 - 4:00: Age Specific Population Growth Models

- Clayton Coonrod

4:00 - 4:15: The Wehrmacht in the Mohawk Valley and the North Country

- David J Cooney

4:15 - 4:30: Finding the Disappeared of Argentina: Current Research in Forensic Anthropology

- Kristina Perez

4:30 - 4:45: Immigrants Living in the Shadows of America

- Sandra Pineda

POSTER SESSION: Library Concourse

Enseignement des Langues Étrangères en France et aux États-Unis (The Teaching of Foreign Languages in France and in the United States)

Alana Wielgosz

Prof. Tina Oyer Ponce, Faculty Advisor

The way in which foreign language learning is viewed and taught in France and in the United States along with the strengths and weaknesses of both systems.

Terrestrial Phase Tiger Salamanders Have Increased Visual Acuity Compared to Aquatic Phase Tiger Salamanders

Ashley Rohacek

Prof. Amy Lindsey, Faculty Advisor

Tiger salamanders are a common model to study retinal physiology. A predator-prey model was used to measure visual angle in this animal. This data supports psychophysical description of tiger salamander vision. Behavioral description of vision in the tiger salamander may further our understanding of vision in respond to environmental factors.

Exploring the CRAG: Strong HI Absorption in the CGM of ALFALFA Galaxies

Chelsey McMichael

Prof. Joseph Ribaud, Faculty Advisor

As part of our Survey of the Circumgalactic Regions of the ALFALFA Galaxies (CRAG), we report on the identification and analysis of strong HI absorption in the circumgalactic medium (CGM) of the ALFALFA galaxies as identified in archival HST/COS G130M QSO spectroscopic observations. We characterize the HI and metal content of these strong absorbers and explore the physical distribution of the CGM for these galaxies. Using photometric, spectroscopic, and imaging observations from the Sloan Digital Sky Survey, we analyze the environments of these galaxies. We also summarize the gas-galaxy connection for this sample of strong HI absorbers and HI-rich galaxies. This work has been supported by NSF grant AST-1716569.

Exploring the CRAG: The Missing CGM of the ALFALFA Galaxies

Liam Patterson and Chelsey McMichael
Prof. Joseph Ribaldo, Faculty Advisor

As part of our Survey of the Circumgalactic Regions of the ALFALFA Galaxies (CRAG), we report on the analysis of QSO sightlines that pass within ~ 150 kpc of ALFALFA galaxies that show no discernable evidence of a Circumgalactic Medium (CGM) as probed by the presence of Ly α absorption. Many of these corresponding galaxies reside in group or cluster environments, in agreement with recent studies that indicate the nearby galaxy environment plays a significant role in determining the physical conditions of the CGM. However, we also identify a sample of isolated ALFALFA galaxies that show no evidence of HI within ~ 150 kpc - suggesting the physical distribution of the CGM around these galaxies is patchy and non-uniform, even within relatively small volumes around the galaxies. We explore photometric, spectroscopic, and imaging observations from the Sloan Digital Sky Survey (SDSS) in an attempt to characterize the properties these galaxies and the environments in which they reside.

The History of Child Life Specialists in Chicago

Kassidy Krenzer
Prof. DeAnna Bay, Faculty Advisor

The profession of child life is a growing field that has achieved remarkable milestones. This poster focuses on the timeline of child life in Chicago.

Geochemical Study of Likely Cambrian or Ordovician Age Rocks of The Avery Brook Formation and an Unnamed Tonalite Near Caucomgomoc Lake, Northern Maine

Enock Bunyon

Prof. Adam Schoonmaker, Faculty Advisor

The Avery Brook Formation is a thick unit of deformed massive greenstones and greenschists, locally pillowed, and likely of Cambrian or Ordovician age. It contains metamorphic chlorite, plagioclase, actinolite, epidote, and opaques, with some relict igneous plagioclase and clinopyroxene in some samples. In fault contact with the Avery Brook Formation is the Hurd Mountain Formation, also likely of Cambrian or Ordovician age. It is mélangé with knockers of greenstone and limestone, locally intruded by metagabbro and meta-diabase, metamorphosed to greenschist grade. The Hurd Mountain Formation is also intruded by a large stock of tonalite that is undeformed and only slightly metamorphosed. The tonalite contains plagioclase, quartz and hornblende partially recrystallized to chlorite, actinolite and epidote.

Avery Brook and tonalite samples were analyzed by XRF and ICP-MS. Geochemical discrimination diagrams show that the Avery Brook plots in mid-ocean ridge (MOR) and volcanic arc (VAB) fields. On $Zr/4-Y-Nb^*2$, $Th-Ta-Hf/3$, $Th/Yb-Ta/Yb$, and $Zr-Y^*3-Ti$ diagrams, the Avery Brook plots in both VAB and MOR fields. On Cr-Y and Ti/1000-V discrimination diagrams the Avery Brook plots in the MOR field. On Ce-Nb and $Y/15-La/10-Nb/8$ diagrams, the Avery Brook plots in backarc basin and VAB fields. The MORB-normalized diagram of the Avery Brook shows a Ta-Nb negative anomaly indicating a supra-subduction zone setting. The chondrite-normalized diagram shows no enrichment of incompatible elements indicating a depleted mantle source. Overall, samples from the Avery Brook Formation display characteristics of both MOR and VAB tectonic settings, and is similar to previous analyses of metabasalt knockers and intrusive metagabbros in the Hurd Mountain Formation.

The tonalite samples have higher silica contents ranging from 69% to 72% and plot in volcanic arc fields of the Rb-Y-Nb and Y-Nb granite discrimination diagrams.

The geochemical data of the Avery Brook and tonalite, and their relationship with the Hurd Mountain mélangé is consistent with a ridge subduction event, although a collapsed backarc basin setting is also permissible. The tonalite likely intruded shortly after deformation, but while temperatures were still at greenschist facies conditions.

Relationship of Diatom Size with Dust and Temperature During the Last Glacial Period in the Southern Ocean

Erica Hulbert

Prof. Sharon Kanfoush, Faculty Advisor

Footo and Kanfoush (2012) examined the Southern Ocean diatom *Fragilariopsis kerguelensis* to determine if wind delivered nutrients that affected valve size over the last deglaciation. Their data revealed the opposite relationship from what they had predicted. A strong inverse relationship existed between valve length and natural gamma radiation (NGR), an indicator of terrigenous sediment – potentially dust - delivery to the site. They inferred that small valve size in the last glacial period resulted from silica limitation due to competition as iron-delivery increased population size of diatoms. Alternatively, they contended extensive ice coverage of the glacial maximum caused light-limitation, hindering diatom growth. In this study, we extended the record further into the glacial period to ascertain valve size under less severe glacial conditions punctuated by short-term warm events recorded in the Vostok ice core in order to potentially differentiate between these two competing hypotheses.

Samples came from the Southern Ocean site 1094A collected on leg 177 of the Ocean Drilling Program. 25 samples were examined from the last glacial period, spanning 43 ka to 74 ka. Subsamples were placed on slides with deionized water to create smear slides and coverslips mounted using Norland Optical Adhesive fixed under UV light for 30 minutes. Valve length and width of fossil *F. kerguelensis* 30 individuals in each sample were measured under 400x magnification on an Olympus differential interference contrast microscope.

Valve length ranged from 10 μ - 50 μ while width had a range of 3 μ - 9 μ . A strong positive correlation exists between maximum length of *F. kerguelensis* and NGR during the last glacial period. Such a correlation does not exist with valve width.

This suggests high NGR, inferred high dust and iron influx, increased length of diatom individuals. The lack of increase in valve width with high NGR suggests, however, a secondary control. When ocean surface water temperature was warmer and less dense diatoms have a harder time staying in the photic zone so there was an increase in length and width ratio to increase surface area-to-volume ratio.

Synthesis of Novel Auxiliary Molecules for Stereospecific Peptide Ligation

Emilee Stevens

Prof. Benjamin Williamson, Faculty Advisor

Protein subunits that have been constructed or modified to highly exacting specifications are a critical resource for many fields of scientific research. It is of critical importance that these proteins are enantiomerically pure. Therefore synthetic methodology for producing peptide chains in a way that is stereospecific is a critical endeavor. Unfortunately, the formation of amide bonds during peptide synthesis, or ligation, is achieved via a mechanistic pathway in which epimerization of the chiral centers in the peptide subunits is possible. Epimerization is particularly common when overly reactive electrophiles, such as acid chloride derivatives of the C-terminus, are used during the ligation step.

Synthetic peptide auxiliaries have been developed to support epimerization-free ligation, by providing a way to facilitate amide bond formation between an added amino acid and peptide chain through a weaker electrophile, which itself is not susceptible to epimerization. Once the peptide chain and amino acid are linked via the auxiliary molecule, intramolecular acyl substitution to form peptide bond between the peptide chain and new amino acid becomes energetically favorable.

In the current work, progress in the synthesis towards novel salicylaldehyde peptide auxiliary, which prevents epimerization through bulky substituents, is described. The long-term goal of the project is to develop an auxiliary that will make epimerization-free ligation between any two peptides possible.

The Effect of Male Experience on Female Rejection Behavior in House Mice (*Mus musculus*)

Jennifer Pollic

Prof. Dr. Keesom, Faculty Advisor

Female animals across many sexually reproducing species exhibit mate preference behaviors. Females should mate with the best quality male that they can, in order to increase quality and likelihood of survival of offspring. During mating interactions between house mice (*Mus musculus*), female mice display kicking behaviors towards males, which may be used as a form of rejection. The aim of this study was to determine the effect of male experience on female “rejection” behavior during courtship. We predicted that females would display decreased rejection behavior to males having increased experience with females. We made this prediction because experienced male mice show decreased infanticidal behavior compared to naive males. In the current study, female mice were placed with male mice of various degrees of previous experience with females: no female interaction after weaning, 1 female interaction after weaning, 2 female interactions after weaning, and 7-9 female interactions after weaning. Audio and video recordings were made from these 10-min social interactions. We then quantified female “rejections” as male-directed kicking and male approaches to females, in order to calculate percent acceptances and percent rejections by females of naive and experienced males. The results from this study will shed light on male qualities used by female mice in mating decisions and the behaviors used by females to regulate events during courtship.

The roar within a squeak: variation in female mouse vocalizations in response to different males

Skylar Harwick

Prof. Sarah M. Keesom, Faculty Advisor

Several mammalian species employ vocal communication as a means to exchange social information, including individual identity, reproductive state, and behavioral arousal. House mice (*Mus musculus*) emit different types of vocalizations depending on social context. During courtship interactions, female mice produce low-frequency, broadband vocalizations (BBVs), commonly referred to as “squeaks.” Previous research suggests that female mice use BBVs as a “rejection” behavior directed at courting males, since high numbers of BBVs produced by females early in an interaction with a male predicts an absence of copulation later in the encounter. It is unknown whether female mice use BBVs differently depending on qualities of males, including male experience with females. Thus, the aim of this research is to determine the influence of male mouse experience on female broadband vocalizations used during courtship. In the current study, vocalizations were recorded from 10-min social interactions between female mice and male mice with varying levels of previous experience with females. Spectrographic analysis of mouse vocalizations was conducted using Raven Pro (Cornell Lab of Ornithology). Results from this study will elucidate the extent to which female mice alter spectrotemporal parameters of these “rejection” calls in response to males of varying quality.

Exploring Green Chemistry Methodologies in an Analytical Teaching Laboratory

Francesca Milazzo

Prof. Natalie O'Neil, Faculty Advisor

Quantitative analysis, CHE 323, is a required and essential component to the educational career of a chemistry student at Utica College. This course is where students learn fundamental and modern chemical analysis methods. Currently, many analytical teaching laboratory protocols utilize hazardous chemicals and create wastes with greater toxicity than that of the sample being analyzed. Instructors of CHE 323 use the laboratory procedures from the Quantitative analysis textbook, *Fundamentals of Analytical Chemistry*, under the chapter designated Selected Methods of Analysis. Our current work specifically explores the procedure entitled, Titrations with Potassium Permanganate (38F-3), in which students determine the amount of calcium in limestone samples. At the conclusion of this lab, the Chemistry Department recovers large quantities of hazardous waste, a significant portion being unused and unstable potassium permanganate. Potassium permanganate is classified as corrosive (skin corrosion and serious eye damage) and environmentally damaging (hazard to aquatic environment) ranked as a category 1 hazard (most dangerous by the Globally Harmonized System (GHS)). Using methods of green chemistry, our goal is to replace potassium permanganate with another, less harmful, oxidizer to ensure the same analytical precision of the original lab procedure and/or to scale down the amount potassium permanganate produced, if a safer chemical substitute cannot be identified. The incorporation of green chemistry into analytical methods, such as CHE 323 at Utica College, can reduce the environmental impact from hazardous waste and create awareness in developing chemistry students of green chemistry principles. The purpose of exploring green chemistry methods within analytical teaching laboratories is to close a gap that has been created from traditional analytical methods to newer principles of green chemistry.

Exploring the Mechanochemical Synthesis of Metal Ammine Chlorides

Kaitlin Mahardy and Christa Pham

Prof. Dr. Natalie O'Neil, Faculty Advisor

As the production of energy by combustion of fossil fuels decreases due to its detrimental environmental impacts, research into sustainable and environmentally compatible energy storage is necessary. Hydrogen has been proposed as an alternative energy carrier, however, major challenges persist in the storage of hydrogen. Therefore, materials which indirectly store hydrogen are of great interest. Ammonia is a favorable hydrogen carrier because it can be cracked over a catalyst to produce hydrogen and nitrogen a non-greenhouse gas. The main disadvantage of ammonia is its toxicity. However, storing ammonia in the solid state adequately reduces the vapor pressure, making transportation acceptable and prevents toxic leakage. Metal ammine chlorides store ammonia in the solid state and recent literature reports the complexes can be utilized as reversible, indirect hydrogen storage materials. In our current work, mechanochemistry is explored in the synthesis of metal ammine chlorides. The goal of this project is to “green” the synthetic approach to metal ammine chlorides by using a mechanochemistry synthetic approach. The motive for using this method is to have stoichiometric control over the reaction, thereby reducing the amount of excess ammonia currently used in the solution synthesis of the compound.

Growth and development of African Clawed Frog (*Xenopus laevis*) larvae reared under different intensities of LED light at night

Jennifer Liu and Danielle Haasbeek

Prof. Dr. Bryant Buchanan and Dr. Sharon Wise, Faculty Advisor

Amphibian populations are declining rapidly and globally due to several anthropogenic changes to natural ecosystems including habitat loss, climate change, introduced species, pollution, and disease. Most amphibians are nocturnal, so the global increase in light pollution (Artificial Light At Night, ALAN) and its disruption of natural, dark nights has the potential to negatively affect amphibians that are reliant upon distinct light-and-dark-dependent circadian cues and dark nocturnal illuminations. Previous research in our lab has examined the effects of fluorescent ALAN on development of frogs and found that even low levels of ALAN causes accelerated growth but delayed development in African Clawed Frog (*Xenopus laevis*) larvae. However, little is known about the effects of ALAN from LED (Light-Emitting Diode) lamps on frog growth and development. Understanding the impact of LED lighting is particularly important because of the recent, rapid replacement of incandescent, halogen, and fluorescent lamp technologies with more energy-efficient LED lamps. We hypothesized that ALAN from LEDs would enhance growth and delay development of clawed frog larvae in the same way that fluorescent lighting does. To test this hypothesis, we exposed larvae of *X. laevis* (24 h post-fertilization) to four lighting treatments throughout their larval period. All larvae were exposed to a 12L:12D photoperiod with 100 lx day lighting and were randomly assigned to one of four different nocturnal light treatments (0.0001 lx, 0.01 lx, 1 lx, 100 lx). We then measured body length (using ImageJ, NIH) and developmental stage from digital photographs of tadpoles in the different night-lighting treatments. We found larvae grew significantly larger at 1 lx and 100 lx than at 0.01 lx and 0.0001 lx. Larval development was significantly delayed in larvae reared at 100 lx compared to the dark control (0.0001 lx) and all other levels of ALAN (0.01 lx and 1 lx). These results suggest that moderate to high intensities of LED ALAN can increase tadpole growth and delay development. ALAN-induced changes to size at metamorphosis and developmental rate could have ecological implications for anurans exposed to those conditions. Our previous research suggests that fluorescent ALAN has a more pronounced effect at lower illuminations than LED lighting of the same intensity but a separate experiment directly comparing LED and fluorescent lighting at the same intensity will be necessary to directly compare these two sources.

SESSION A: Macfarlane Auditorium
Moderator: Elizabeth Threadgill, Assistant Professor of English

Utica College Student-Run Pro Bono Health Services

Evan Priest Evan Priest, Amanda Lane, Shannon Fillmore, Tyler Wenzel, Jordan Noga, Gianna Cavalier
Prof. Molly Hickey, Faculty Advisor

Through an extensive process of planning and development, we have established an anticipated model for student-run pro bono physical therapy services to provide care for the underserved populations of the greater Utica area. We will discuss our process of establishing need and support, as well as how we developed our clinical model and how students from Utica College will be able to get involved with these services in Fall of 2019. We plan to discuss the major challenges we faced, as well as the valuable learning experiences that came from this process. We will also discuss where we would like this clinic to be directed in the future, along with the logistics and parameters behind expansion. We will also present our plans to incorporate other professions to create an interprofessional practice with physical therapy, occupational therapy, nursing, nutrition, therapeutic recreation, and business professions, as we grow these services over time.

The Effects of Blood Flow Restriction Training on Strength, Hypertrophy, and Function in Older Adults: A Systematic Review

Richard Spinella, Derrick Sekuterski, Thomas Jalowiec, and Daniel Clark
Prof. Dr. Ashraf Elazzazi , Faculty Advisor

Background:

Utilizing blood flow restriction (BFR) training with both low-load resistance training and aerobic training has been proven to promote strength and hypertrophy gains greater than those of low-load training alone. More research and conclusions have been made in younger, athletic populations as compared to older adults.

Purpose:

The purpose of this systematic review was to compare the strength, functional, and hypertrophic effects of low-load BFR training to traditional, high intensity resistance training as well as low intensity resistance training. BFR walking was also compared to traditional walking.

Method:

An electronic database search was conducted in February, 2019 using an EBSCO Host search that searched the following databases: Academic Search Complete, AgeLine, CINAHL Complete, Cochrane Central Register of Controlled Trials, Cochrane Database of Systematic Reviews, Health Source: Nursing/Academic Edition, MEDLINE Complete, and SPORTDiscus with Full Text. In addition, a hand search of literature was performed. The Cochrane Risk of Bias tool was used to assess bias of the articles.

Results:

Out of 457 articles that were screened, 15 articles met the inclusion criteria of our systematic review. Thirteen of the articles used BFR in addition to resistance training, and two articles used BFR in addition to walking.

Conclusion: Blood flow restriction training results in greater strength and hypertrophic adaptations than low load resistance training, and similar adaptations to high load resistance training. Walking with BFR results in improved strength, hypertrophy, and function that is not seen when walking without BFR. More research is needed in older adults to further explore the effects of BFR training on functional outcomes.

Outcomes following LSVT BIG® on Balance, Mobility, and Function in an Individual with Idiopathic Normal Pressure Hydrocephalus: A Case Report

Gianna Cavalier, Shannon Fillmore, Holly Franke, Marissa Hajec, and Anthony Thomas

Prof. Gabriele Moriello , Faculty Advisor

Background and Purpose:

To our knowledge, there is no literature exploring the effects of skilled physical therapy interventions on individuals with idiopathic normal pressure hydrocephalus (iNPH). Similarities in symptoms between iNPH and Parkinson’s disease (PD) have previously been documented. It is possible that Lee Silverman Voice Treatment BIG® (LSVT BIG®), which is an evidence-based intervention used with those who have PD, could also help individuals with iNPH. The purpose of this case report was to document outcomes of LSVT BIG on balance, balance confidence, lower extremity strength, mobility, and subjective reports of mobility in an individual with iNPH.

Case Description:

The participant was a 62-year-old male diagnosed with iNPH 16 years prior to participation in this case report. He demonstrated hypokinesia, rigidity, and decreased amplitude of movement that resulted in impaired balance and functional mobility.

Outcomes:

Outcome measures were taken at baseline, following the LSVT BIG training, and at 3-month follow-up. Outcome measures included the Berg Balance Scale (BBS), the Timed “Up & Go” test (TUG), the TUG Cognitive and Manual, the Activities-specific Balance and Confidence (ABC) Scale, Five Times Sit to Stand test (5TSTS), and a timed supine to standing transfer. The intervention followed the standardized 4-week LSVT BIG® training program. The participant demonstrated improvements which exceeded the minimal detectable change (MDC) value on the BBS, from 34 at baseline to 54 post-treatment and then the score decreased to 47 at the 3-month follow-up. Scores on the ABC Scale improved beyond measurement error from 36.3% at baseline to 82.2% post-treatment and then decreased to 70.3% at the 3-month follow-up. The participant was able to stand up from the floor 2.7 seconds faster post treatment. No improvements were noted on the TUG, TUG Cognitive, TUG Manual or 5TSTS. Discussion: The outcomes from this case report suggest that the LSVT BIG® intervention may have reduced the risk of falls by improving balance and balance confidence in an individual with iNPH. The 16 sessions utilized in this study may not have been enough time to create long term changes in order to achieve true motor learning, as the changes were not maintained at the 3-month follow up. Further research with a larger sample size is needed to determine the parameters of the implementation of LSVT BIG on individuals with iNPH.

Social Media and Independent Artists

Tiffany Simmons

Prof. Patricia Swann, Faculty Advisor

As a form of promotional and marketing materials independent artists use social media as a way to reach a much broader audience. Looking into how and why each artist uses social media can give other users and artists a look at the potential of social media as a outlet for promotional purposes. Looking into the topic further the researcher wanted to find out what was “accepted” as promotional tools by the independent music industry. After interviewing five independent artists the researcher were able to get a better look at what is accepted and or popular in the industry.

Behavioral Implications of Racial Tension Within a YouTube Comment Thread

Cara Patterson

Prof. Prof. Elizabeth Threadgill, Faculty Advisor

For this research project, I qualitatively analyzed comments on a YouTube video displaying a three-minute excerpt from the comedy show Fear of a Brown Planet by Aamer Rahman and Nazeem Hussain. I engaged in a grounded theory analysis based on Saldaña’s (2009) explanation in The Coding Manual for Qualitative Researchers to formulate codes, categories, themes and a theory. Instead of beginning with a research question, the data guided me to develop my theory: commenters’ online behavior is a manifestation of tension between white and Black people that originates from a painful racial history of slavery and oppression. This tension leads to white fragility, stereotypes, and misconceptions about racism. The themes from which I derived this theory are (a) racial relatability and white fragility; (b) painful historical effects of racism; and (c) misconstruing the essence of racism. This research project is IRB Exempt through ENG 102 taught by Professor Elizabeth Threadgill. Racism has evolved over the course of history to correspond with its contemporary social environment, and it continuously adapts to the present. This serves as a premise for the relationship between reverse racism and racial tension within an online comment thread.

Sexual Assault and Twitter

Kaitlyn Tambasco
Prof. Patricia Swann, Faculty Advisor

#whyididn'treport

The Implementation of Active Shooter Self Defense in the College Setting

Sara Gribanoff and Rebecca Bruce
Prof. Richard B. Duque, Faculty Advisor

This study evaluates the value of hands-on self-defense training to prepare students for an Active Shooter event. Research on Victimology suggests that females are the least prepared for violent acts as well as at more risk to them. Meanwhile, the choice of females to seek martial arts training is explored with a critique of institutional programs preparing organizational members for Active Shooter events. To evaluate the salience of martial arts training to prepare organizational members for Active Shooter events, fifty college students participated in two sessions: one hands-on and one traditional lecture style. Participants were administered a pre- and post-survey after the training that included questions about prior self-defense history, active shooter event experiences, confidence levels during an event, and demographic questions. Statistical results show that, while there is no difference in outcomes between the two sessions, female students are more likely to decrease their fear of Active Shooters and increase their confidence in knowing what to do in case of an Active Shooter event.

SESSION B: Thurston Auditorium

Moderator: Jun Kwon, Assistant Professor of Government and Politics

China & Vietnam: A Comparative Study of State Politics and the Catholic Church

Hyesung Jang

Prof. Dr. J. T. Kwon, Faculty Advisor

The Catholic Church has been universal in its outreach in almost all states whether democratic or authoritarian. However, the People's Republic of China is one major power that rejects the authority of the Vatican over religious matters and has formed Chinese Patriotic Catholic Association (CPCA) in response. The existence of the CPCA is unique because it exists under the authority of the Chinese Communist Party (CCP) as part of the state apparatus, which makes logical sense considering that the goal of a state is to survive and maintain control. However, the Socialist Republic of Vietnam (1975-) accepts the authority of the Vatican over ecclesial matters despite having a similar political ideology, economy, and challenges to governance. Thus, the question that should be asked is why is China resistant to the authority of the Vatican over ecclesial matters while many other authoritarian states have not?

This essay plans to examine the unique response that China has to the Catholic Church and the authority of the Vatican by examining four independent variables to explain the dependent variable of resistance to the Vatican. The independent variables that are examined are: colonial experiences, treatment of the Catholic Church in domestic politics, the geopolitical power of the states, and the domestic political culture and history.

Ultimately, through the most-similar-systems design method of analysis, one finds that the colonial differences and political history between the two cases is what causes these two similar states to diverge in their approach to Vatican authority. Due to CCP's need to maintain legitimacy and nationalism as part of the state apparatus they are more inclined to exercise greater control over religious affairs, especially when they have greater challenges concerning their ideology towards Western ideals.

New York State Recidivism

Alexa Pedersen

Prof. Brett Orzechowski, Faculty Advisor

This presentation uses a large data set on New York State recidivism rates from 2008 to 2012. This data set is used to look at and compares four NYS counties and the various factors as to why some counties have higher recidivism rates. Some of these factors include different programs, poverty and population.

Official Corruption

Xinyi Wang
Prof. Choo, Faculty Advisor

The study will introduce official corruption and its extension. By introducing the definition of corruption, it is a detailed explanation of what is official corruption. And, in what way is the official staff corrupted, and what benefits are gained from corruption. Also, it is very important to study the corruption of official staff. Corruption is abhorrent, but what is even more odious is the corruption of official personnel. Because it can quickly spread the toxins of corruption to farther fields, the harm of a small official is enough to make people lose information to the government, leading to social unrest. A very representative case is US Congressman Menendez, who violates the trust of voters and treats himself as a personal member of his good friend and benefits from it. In order to control the corrupt practices of officials, Congress established the Office of the Attorney General. Each office has an Attorney General who is responsible for identifying, auditing and investigating any form of corruption within the national government and law enforcement, such as waste, abuse, fraud, bribery, etc., and the field of investigation has expanded to a wider area. The Attorney General's Office and the US Department of Justice are working together to combat corruption. Their goal is to create a fair and equitable national system. The presentation will introduce official corruption at the US level, and the use of official corruption in China, and compare the two countries' national conditions.

Keywords: official corruption, the United States, China, comparison, Menendez, OIG, solution

Money Laundering Issue in China and U.S.

Zewei Zheng
Prof. Kyung-Seok Choo, Faculty Advisor

This paper discusses the difference of money laundering between China and America. It will discuss the definitional issue, methods of money laundering, and sentence. With the development of economy, money laundering is becoming more and more serious issue to the global economy. In the same time, money laundering has a great damage to the economic order. Money laundering is the most important things to those criminals who are planning to legally use the illegal money. Therefore, the crackdown on money laundering can effectively restrict crimes. As the most developed country in world, America has full experience to money laundering. Hence, it can be a very useful for China to learn from the experience of America.

Key words: money laundering, law definition, methods of money laundering, China and America.

Bribery compare between China and The United States

Hang Pan

Prof. Kyung-Seok Choo, Faculty Advisor

This paper will discuss the situation of bribery between China and America. Firstly, this paper will introduce the very different system of Chinese government and American government. Secondly, compared with the bribery from different aspects between China and America, such as the relationship between the officer and receiver, the institutions involved in the bribery and the types of bribery. Thirdly, this paper will figure out what kinds of reasons cause these bribery cases. Fourthly, when the bribery happened, how the supervision system reacts to these cases? At last, this paper will pay attention to the reform of Chinese supervision system and try to figure out the difference between the old system and new system. Also, compared the supervision system between China and America.

Key word: Bribery, government system, officer and receiver, supervision system, reform

Insurance Fraud Issues Between China and American

Rongshan Cai

Prof. Kyung-Seok Choo, Faculty Advisor

This study will mainly introduce the problem of insurance fraud in China and the United States. It will discuss the definition of insurance, how insurance develops, the impact of fraud on the insurance industry, relevant laws and regulations, the status quo of insurance fraud and prevention strategies. The content will be presented in the form of a comparison between China and the United States. Insurance fraud involves a wide range of content, so here are mainly divided into five categories for introduction: life insurance, car insurance, housing insurance, medical insurance and other insurance. Insurance fraud can exist at any time related to insurance, such as when the insurance is signed, before the insurance claims assessment, etc. This research will introduce several common types of insurance fraud, and illustrate how criminals commit fraud with several specific cases. Then we will compare the types of fraud crimes in China and the United States to see the degree and size of fraud crimes in the two countries. And the Chinese and American governments are how to combat insurance crime, how effective. Finally, according to the research of some scholars and the national conditions of China and the United States, some precautions that can normally prevent fraud will be given accordingly.

Keywords: insurance fraud, comparison between China and America.

SESSION C: Gordon 261

Moderator: Sarah Keesom, Assistant Professor of Biology

Investigating the Genetic Relationship Between Geographically Isolated Populations of *Physa acuta* in New York State

Madison Burnham and Anthony DiMambro

Prof. Jessica Thomas and Tom McCarthy, Faculty Advisor

Physa acuta are invasive, hermaphroditic freshwater snails capable of self-fertilization. Self-fertilization increases the chances for various forms of genetic drift, such as the founder effect, because a single snail could populate a new territory. This would make the daughter population genetically distinguishable from the parent population. Understanding how populations interact and potentially diverge is important in order to determine management techniques for invasive species, such as *P. acuta*, which is thought to have originated in North America and is currently invasive at a worldwide level. To evaluate migration and mating patterns in local *P. acuta*, we will compare microsatellite polymorphisms within and between populations using multiplex PCR and high-resolution capillary electrophoresis (Cornell University). We are currently researching the genetic relationship between six populations of *P. acuta* from local ponds and rivers that present different selection pressures, using *P. gyrina* as an outgroup. Though we have not yet determined a phylogeny of these populations, our current data supports that several microsatellite loci found in *P. acuta* from France are present in local *P. acuta* and two of the loci are found in local *P. gyrina*.

Effects of *Pseudomonas uticensis* on Growth and Germination Rate of *Arabidopsis thaliana*

Tommy Ciccolella

Prof. Dr. Scanga, Dr. Aaronson, Faculty Advisor

Many members of the genus *Pseudomonas* have been found to have either symbiotic or pathogenic relationships with plants. Since *Pseudomonas uticensis* is a newly characterized species, its effects on plants have not been studied. We investigated the effect of *P. uticensis* on the seed germination and biomass of the model plant *Arabidopsis thaliana*. We hypothesized that *P. uticensis* would inhibit germination of *A. thaliana* seeds and decrease total biomass of inoculated seedlings. We grew seeds (~10 seeds per plate) under sterile conditions on Murashige and Skoog medium in the presence and absence of *P. uticensis*. The medium was either supplemented with tryptone or citrate, two food sources for *P. uticensis*. In a second experiment, we applied 1 ml of liquid *P. uticensis* culture or a control to each of 8 *A. thaliana* seedlings in the greenhouse. Preliminary results indicate that *A. thaliana* seed germination is inhibited by *P. uticensis*, perhaps due to the bacterium's ability to produce hydrogen cyanide gas, which has previously been shown to be toxic to *A. thaliana*.

Analysis of Amylase Production in *Pseudomonas uticensis*

Sarah Mirza

Prof. Lawrence Aaronson, Faculty Advisor

Pseudomonas uticensis is a novel bacterial species that was isolated from the cutaneous flora of red-backed salamanders in Central New York. Previous biochemical evidence has shown that *P. uticensis* can oxidize dextrin as a carbon source. Phylogenetic analysis reveals that most related *Pseudomonas* species cannot perform dextrin oxidation. The completed *P. uticensis* genomic DNA sequence was searched for genes encoding amylase, which is responsible for hydrolyzing dextrin, and a single glucoamylase gene was found. Amylase is used to convert starch into sugars. Enzyme production may be controlled by the availability of carbon sources. By changing the availability of carbon, we can see under what conditions the glucoamylase gene is upregulated or downregulated. This can be tested by performing an amylase assay. *P. uticensis* was grown on 5 plates tryptic soy agar and starch and 5 plates of LMM agar and starch in 100mm Petri plates for 24h. It was found that starch alone as a carbon source did not support growth of *P. uticensis*, and the bacteria exhibited no evidence of starch hydrolysis on TSA + starch agar plates. *P. uticensis* was then cultured on 5 plates of tryptic soy agar and dextrin and 5 plates of LMM agar and dextrin in 100mm plates for 24h. Bacterial growth was shown on TSA + dextrin plates, but none on the LMM agar + dextrin plates. This could indicate that glucoamylase is not an exoenzyme, but contained in the periplasmic space or cytoplasm of *P. uticensis*.

Effects of Carbon Source on Alginate Biosynthesis and Biofilm Adhesion in the Melanogenic Bacterium, *Pseudomonas uticensis*

Evan Vescio, Jenn A. Liu, and Sarah F. Mirza
Prof. Dr. Aaronson, Faculty Advisor

Pseudomonas uticensis is a novel bacterial species with potent antifungal properties. It is nonfermenting, nitrogen-reducing, and utilizes citrate and succinate as its preferred carbon sources. A distinctive characteristic of this species is its reddish-brown pigmentation when grown on media with citrate or tyrosine, suggesting that the pigment is a form of melanin. The bacteria produces two different forms of melanin: pyomelanin, which is a low MW secreted form, and a high MW intracellular melanin. *P. uticensis* also generates robust biofilms, and colonies have a mucoid characteristic, suggesting that it produces abundant extracellular polysaccharide (EPS). The *P. uticensis* genome sequence contains numerous genes encoding enzymes for the biosynthesis of alginate, a major EPS component of the bacterial biofilm matrix. One function of alginate and other matrix components is adhesion of *P. uticensis* biofilms to surfaces. In studies unrelated to biofilm development, we observed that adhesion of lawns of *P. uticensis* on agar media varied depending upon the composition of the media. Bacteria exhibited strong adhesion when grown on agar plates containing citrate as the primary carbon source, but easily washed off agar surfaces in its absence, despite the abundance of tryptones and amino acids as carbon sources. We hypothesized that the form of carbon source altered the synthesis and composition of the EPS, and tested this hypothesis by using transposon-mediated mutagenesis to isolate mutants of *P. uticensis* that did not adhere to agar medium containing citrate. Ten isolates were found that easily washed off of citrate-enriched agar medium. A Congo Red binding assay was used to directly quantify alginate yield in the mutant strains, and several isolates produced up to 5-fold lower amounts of alginate compared to the wild-type. Another peculiar phenotype of the alginate mutants is the hypersecretion of pyomelanin in tyrosine-enriched media. We hypothesized that this was the result of melanin that is normally trapped in the matrix being released from the alginate-deficient biofilm matrix. To test this idea, biofilms of wild-type cells were treated with alginate lyase, and melanin release was measured spectrophotometrically. Results showed that melanin release from biofilms was 4-17 times higher with alginate lyase treatment than in untreated controls, suggesting that some of the colony- and biofilm-associated pigment is pyomelanin trapped in the EPS.

Effects of Copper on Melanin Production and Growth in *Pseudomonas uticensis*

Ahmedina Mehmedovic and Sania Safdar
Prof. Dr. Lawrence Aaronson , Faculty Advisor

Pseudomonas uticensis is a recently discovered strain of bacteria found on the skin of the redbacked salamander. We know that *Pseudomonas uticensis* is a strain of *Pseudomonas* that produces melanin. Melanin is produced by oxidative polymerization of the phenolic compounds catechol, allomelanins, eumelanins, pheomelanin, and pyomelanin. Melanin has the ability to absorb a variety of electromagnetic radiations including visible light, UV light, and X-Rays. Absorption of different wavelengths of radiation acts as a survival tool and an enhancer for competitive abilities. Copper is an important aspect in the production of melanin. Previous studies conducted in our laboratory have found evidence that *P. uticensis* produces melanin through the catabolism of tyrosine and possibly through laccase since there is a laccase like gene in our genome. Laccase is a phenol oxidase, meaning that this copper enzyme utilizes oxygen to catalyze the oxidation of aromatic compounds. Although copper is significant in the production of melanin and is an important micronutrient for most living organisms, organisms can only utilize copper at low levels as it poses toxic effects at high levels. It is unknown whether bacteria, like *Pseudomonas uticensis*, will grow in environments with high copper concentrations. This experiment will be testing to see if *Pseudomonas uticensis* will grow in different concentrations of copper sulfate titrated Tryptic Soy Broth. We initially tested bacterial growth between broad copper concentrations of 0.05mM to 10mM of copper. This was our starting range. Data acquired from this experiment lead us to change the range of copper concentrations to be between 0.05mM to 5mM. This range is more specific to where growth was more predominant. Data acquired from this second experiment lead us to change our concentrations to be between 0.05mM to 1mM. Continuous research needs to be completed to determine the exact final range for optimal living environment for *Pseudomonas uticensis* as this range is still much too broad.

SESSION D: Gordon 262

Moderator: Alyssa Thomas, Associate Professor of Chemistry

PVP stabilized Gold Nanoparticles: Synthesis and UV-Vis Analysis

Olivia Harwick

Prof. Alyssa Thomas, Faculty Advisor

Particles that measure 1 to 100nm in size are nanoparticles, and a nanometer is 10⁻⁹ meter. Gold nanoparticles are used in many applications in imaging, due to their optical effects. This research explored the synthesis of PVP stabilized gold nanoparticles. This research was conducted to synthesize potentially electrically-insulative, hydrophobic nanoparticles that may have useful applications in clothing. Current clothing made from metal nanoparticles alone are not waterproof, and can possibly short-circuit due to their electrical capabilities. Waterproof clothing made from polymer stabilized metal nanoparticles, like those synthesized in this research, may allow the consumer to stay safe while enjoying the electrical capabilities of this clothing upon further future research. The amount by volume of the reducing agent (a polymer, PVP) was varied with a constant volume of gold (tetrachloroauric(III) acid) solution to synthesize solutions of PVP stabilized gold nanoparticles. As the volume of PVP increased, the darker the resulting solution was in color and the number of nanoparticles that dropped out of solution decreased. The nanoparticles synthesized with the least PVP were a dark periwinkle, but the solution became lavender, turbid, and most of the nanoparticles dropped out, which resulted in an almost colorless solution. The solution that resulted from a moderate amount of PVP was a raspberry pink color and was turbid after one day. This turbidity was a result of light scattering properties of large nanoparticles that dropped out of solution, and this caused these solutions to produce an opalescent effect. The nanoparticles synthesized with the highest volume of PVP were a deep raspberry, ox blood red. The UV-Vis spectra of all three solutions were collected a day and beyond after these particles were synthesized to determine differences in λ_{max} , absorbance, and size among these nanoparticles, and also to compare these nanoparticles with the gold nanoparticles synthesized with sodium citrate as the reducing agent.

Synthesis of Gold Nanoparticles using Banana Peel Extract (BPE)

Bridget Hogan

Prof. Alyssa Thomas, Faculty Advisor

Banana peel extract (BPE) was used as a reducing agent to synthesize gold nanoparticles as an eco-friendly, green reaction. The bananas were boiled, crushed in nano-pure water and used to reduce chloroauric acid. Bananas were separated by ripeness and color into less ripe, green, ripe, yellow, and very ripe, brown. The method of preparation of BPE was repeated three times for each of the ripeness. Three separate beakers were used to perform the synthesis of gold nanoparticles, keeping the gold concentration and BPE concentration the same. The change was using different BPEs for each solution.

There were two sets of reactions that were preformed, one group that was heated and stirred and one that sat overnight for twenty-four hours. The ratio of BPE to gold was kept the same for both reactions. Each group of reactions was analyzed using the UV-Vis spectroscopy an also displayed a vivid color change to that of gold nanoparticles. Each spectrum showed that there were indeed nanoparticles present in all solutions with a peak at approximately 550 nm. The use of Banana Peel Extract (BPE) as a reducing agent was seen to be an effective and accurate way to synthesize gold nanoparticles.

Gold Nanorod Synthesis

Alayna Cormier

Prof. Dr. Alyssa Thomas, Faculty Advisor

The object of this experiment was to see if gold nanorods could be produced using two different methods. Gold nanorods are important because of their two ways of absorbing wide ranges of light, called their plasmon resonances. One way they can be used is for photothermal therapy (PPT). This is when electromagnetic radiation, or more specifically infrared wavelengths, are used to treat illnesses such as cancer. Nanorods are especially good at this for their two different plasmon resonances (longitudinal and transverse). Along the length of the nanorod, they are able to absorb more light and convert it to heat which can destroy cancer cells.

There are two different methods used to produce the gold nanorods: (1) seed-mediated and (2) seedless. In the seed-mediated growth method, there were two overall steps: creating seeds and a growth solution. The seeds were added to the growth solution to allow nanorods to develop slowly overtime. For the seedless growth is was a one-step method that produced nanorods after a few days. In both methods, cetyltrimethylammonium bromide (CTAB) was used as the capping agent and sodium borohydride was used as the reducing agent. Both of these methods proved to create nanoparticles, but only the seedless method produced nanorods.

Is nanoparticle size dependent on the ratio of tetrachloroauric (III) acid to sodium citrate?

Lauren Impicciatore

Prof. Dr Alyssa Thomas, Faculty Advisor

Gold nanoparticles can be synthesized using the Turkevich method. This method reduces a tetrachloroauric (III) acid solution with sodium citrate to make particles. Preliminary research showed that a 5mM solution of tetrachloroauric (III) acid and 34mM solution of sodium citrate can be used to synthesize spherical nanoparticles.

In this experiment, the ratio of gold to sodium citrate was tested to see if nanoparticle size was dependent on these ratios. Sodium citrate concentration was kept constant while the concentration of tetrachloroauric (III) acid was varied. The ratios of gold to citrate tested were 1:34, 1:6.8, 1:3.5, and 1:2.4. UV-Vis Spectroscopy was done and analyzed to determine if these ratios altered particle size.

Effects of Reducing Agent Concentration on the Size of Gold Nanoparticles

Emilee Stevens

Prof. Alyssa Thomas , Faculty Advisor

Nanoparticles and their applications have become a huge field of study in recent years due to the promise of breakthroughs in areas such as medicine, electronics, sporting equipment and skin care. Nanoparticles can be synthesized into multiple different shapes and sizes depending on several factors such as choice of reducing agent, concentration of starting materials, etc.. The purpose of this research is to develop different sized nanoparticles by changing the concentration of the sodium citrate solution used to synthesis the particles. The different concentration sodium citrate solutions will be combined with a gold salt solution of known concentration. This new solution will then be heated and stirred until a color change is observed. The color change indicates that nanoparticle have been formed. Once formed the nanoparticles will be analyzed using UV-Vis spectroscopy and the diameter of the nanoparticles will be calculated.

SESSION E: Gordon 271
Moderator: Steven Specht, Professor of Psychology

A Systematic Review of Treating Breast Cancer Related Pain and Fatigue with Aquatic Therapy

Melissa Sayles Melissa Sayles, Karsten Barbagelata, Jacqueline Eadi and Marissa McNamara

Prof. Dr. James Smith, Faculty Advisor

Introduction: Pain and fatigue are frequent impairments from breast cancer or the medical and surgical therapies for breast cancer. Aquatic therapy, the application of water based exercise or activity for rehabilitation, has been recommended as effective for the problems of pain and fatigue. The purpose of this systematic review was to determine if aquatic therapy reduced pain and fatigue among people with breast cancer.

Methods: The protocol for this systematic review was prospectively registered with PROSPERO, and PRISMA standards were followed for the review. Search terms were pilot tested with a research librarian and four databases were searched through February, 2019. Two reviewers screened titles and abstracts (first phase), and full text (second phase) to determine eligibility for inclusion. Two reviewers assessed methodological quality (risk of bias) of included studies with the APTA Critical Appraisal Tool for Experimental Intervention Studies (CAT-EI), and level of evidence with the Oxford Centre for Evidence-based Medicine Levels of Evidence for Therapy / Prevention Studies. Relevant data was extracted into a predetermined template for analysis and thematic synthesis.

Results: Six studies involving 137 subjects who received aquatic therapy were included. All studies had a high or acceptable level of evidence and five studies had a high or acceptable quality (low risk for bias). High quality evidence supported the use of aquatic therapy for reducing the rating of fatigue and acceptable quality evidence supported the use of aquatic therapy for reducing the rating of pain. Most aquatic therapy interventions emphasized strengthening and aerobic exercise, performed for 60 minutes, three times/week, for eight or more weeks. Reported adverse responses to aquatic therapy were minimal, with minor symptoms that resolved within days and had no effect on attrition in the studies.

Conclusion: Based on high level evidence with acceptable risk of bias the intervention of aquatic therapy is recommended as treatment for the impairments of pain and fatigue resulting from breast cancer. The intervention is safe and feasible in this population.

The Cost Effectiveness and Utilization of Physical Therapy for Low Back Pain: A Systematic Review

Lauren Bachner Alice Hamilton, Evan Priest, Pat Shea, and Tyler Wenzel
Prof. Jim Smith, Faculty Advisor

Introduction: The Center for Medicare and Medicaid is shifting towards value-based reimbursement programs that incentivize high-quality and low-cost care. The United State's has a unique health care model for which a systematic review of the cost-effectiveness of physical therapy, and health care utilization associated with physical therapy, has not been performed. The purpose of this systematic review was to assess the evidence on the cost-effectiveness and utilization of physical therapists' (PTs') services for low back pain.

Methods: PRISMA standards were followed for the protocol for this systematic review. Search terms were pilot tested with a research librarian and four databases were searched through February 6, 2019. Two reviewers screened titles and abstracts (first phase), and full text (second phase) to determine studies eligible for inclusion. Two reviewers assessed methodological quality (risk of bias) of included studies with the SIGN Methodology Checklist 6: Economic Evaluation tool, and level of evidence with the Oxford Centre for Evidence-based Medicine Levels of Evidence for Economic and Decision Analyses Studies Rating Scale. Relevant data was extracted into a predetermined template for analysis and thematic synthesis.

Results: Ten studies were included in the review. Evaluation of these studies revealed a low risk of bias and a high level of evidence in all studies. The main theme was that subjects who had early referral to a PT had decreased costs for the treatment of low back pain. Contrary to that, one study reported an increase in costs when PT services were provided while another that chiropractor services for low back pain were less costly than PT services. Two studies reported that increased PT adherence to guidelines was associated with decreased costs for services. Evaluation of utilization found that when PT services were provided diagnostic imaging was reduced (three studies), major surgery for low back pain was reduced (three studies), there was decreased utilization of opioid medications (two studies) and decreased utilization of lumbar spine injections (two studies).

Conclusion: We have confidence in these recommendations due to the consistently high quality (low risk for bias) and level of evidence among the included studies. Recommendations include people with low back pain should receive an early referral to a PT, as that was associated with decreased health care costs and health care utilization; and PT services reduce use of opioids, diagnostic imaging, major surgery, and spine injections. Lack of homogeneity among US-based studies regarding cost-effectiveness of physical therapy limits the conclusions that can be drawn from this review, and further studies are needed to inform value-based reimbursement programs. The lack of homogeneity prohibited meta-analysis of this data.

ACL Injury Risk Factor Reduction in Male Athletes: A Systematic Review

Tom Woznica Aric Freischlag, Jennifer Arts, Connor Passalacqua, and Keri Berkowitz
Prof. David Shilling , Faculty Advisor

INTRODUCTION: The ACL is one of the most frequently injured ligaments of the knee. Due to the limited research on ACL injury prevention in male athletes, the purpose of this study is to perform a comprehensive systematic review of the current literature to determine the significance of an injury prevention program on the risk factors associated with ACL injuries in male athletes.

METHODS: A review of prospective and retrospective studies using a variety of databases was conducted that considered the effects of a prevention program on the risk factors associated with an ACL injury. MeSH terms used were (ACL OR Anterior Cruciate Ligament) AND (Athletes OR Sports OR Athletics) AND (Prevention OR Prevention Program). Inclusion criteria were human data, English language, and within the last 10 years.

RESULTS: Eleven studies were included in this review with a total 18,295 male athletes, ranging from high school to elite professional athletes. Eight articles studied modifiable risk factors such as changes in knee joint loading and lower extremity kinematics and showed considerable change in most of those risk factors, with numerous improvements. Three studies examined the FIFA 11+ warm-up program and concluded that a multimodal approach was beneficial as an ACL injury prevention program.

DISCUSSION AND CONCLUSION: The studies included in this review have explored individual risk factors associated with ACL injuries as well as the FIFA 11+ warm up. Injury prevention programs should include visual feedback, interventions to improved endurance of athletes with longer balance training sessions, sport-specific perturbation training for both the trunk and lower extremity, and a variety of strength and plyometric exercises. Although more research has recently been published, there is still a dearth of literature related to ACL risk factor prevention programs for male athletes. Additional research is needed to determine what the optimal injury prevention program will be for sports that are known to have a higher incidence of ACL injuries.

KEY WORDS: (ACL OR Anterior Cruciate Ligament) AND (Athletes OR Sports OR Athletics) AND (Prevention OR Prevention Program) AND (Risk Factors)

An Investigation of the Relationship Between Attachment Style and Grief

Shannon Cool

Prof. Steven Specht, Faculty Advisor

A study conducted by Field and Sundin (2001) found that anxiously attached individuals were more likely to be unable to cope with loss and were at higher risk for more severe symptoms of grief. The purpose of this study was to assess the relationship between attachment styles and grief reaction scores in college students. The Hogan Grief Reaction Checklist (2001) and the Attachment Style Questionnaire (2003) were completed by participants to assess how individuals with different attachment styles might react to grief. Correlational findings will be discussed. Learning about the behaviors that bereaved college students may exhibit based on their attachment style may help us to better understand how to help students in the most beneficial way.

Ordinal Assessment of Human Capabilities

JoVina Taylor

Prof. Steven Specht, Faculty Advisor

Nussbaum (2011) has proposed that, in order for individuals to flourish and lead a dignified life, a number of “central capabilities” must be realized. For example, “being able have good health”; “being adequately nourished”; “being free from unwarranted search and seizure”; “being able to laugh and to play”. There has been robust discussion recently in the philosophical literature about whether some of these human capabilities might be seen as more important than other – as opposed to being equally salient (e.g., see Riddle 2014; 2019). The purpose of this study was to allow respondents to rank-order various human capabilities in terms of their importance. Of 20 different capabilities, the following 4 were consistently ranked as most important – good health; nourishment and shelter; attachment to others; being able to live as a dignified person.

A Growing American Crisis: The Opioid Epidemic

Margaret Reid

Prof. Brett Orzechowski , Faculty Advisor

The opioid crisis is a problem that is not only addicting countless Americans, but one that continues to rise, killing those who become trapped in its clutches. This project has different perspectives and data on the epidemic, perspectives from police officers, professors, addiction counselors , and family members of those impacted by addiction. Different perspectives include how addictions starts, why opioids are so addictive, and how it can be stopped. Data includes the amount of Americans and New Yorkers who died from overdosing on other drugs and opioids , from 2015-2018.

SESSION F: Gordon 272

Moderator: Brad Emmons, Associate Professor of Mathematics

Who Will Survive in America (Novel Excerpt)

Devan Rodriguez

Prof. Professor Lisa Orr, Faculty Advisor

Over the course of this semester, Dr. Orr has helped me in developing my first novel. Dr. Orr presented me with various exercises and provided feedback to help flesh out my ideas and to incorporate multiple nuanced techniques into my writing, and overall improve my craft. The working title for this novel is "Who Will Survive in America" and follows Oliver Davidson, a student at Old Mills Highschool. When his attempts for societal change in his community are met with ever increasing backlash, he is posed with the question: How far is he willing to go to bring about the change he desires? Oliver ultimately finds himself answering all the way, by joining the Seven Sun Society, a cult offering a way to change the world forever.

Age Specific Population Growth Models

Clayton Coonrod

Prof. Brad Emmons, Faculty Advisor

In this talk, we will discuss a population growth model which considers the growth rate and reproductive rate for each age class in a population. We show how the eigenvalues of the associated Leslie matrix indicates the growth rate of the population. When the growth rate is positive we may harvest from certain age classes to stabilize growth. We investigate harvesting strategies to obtain the optimal yield.

The Wehrmacht in the Mohawk Valley and the North Country

David J Cooney

Prof. Professor DeSimone , Faculty Advisor

During the Second World War, thousands of Captured Germans are sent to the United States, even to our own back yard in Utica. Why were they here and what were they doing?

Finding the Disappeared of Argentina: Current Research in Forensic Anthropology

Kristina Perez

Prof. Helen Blouet, Faculty Advisor

In this presentation, I will talk about the Dirty War period in Argentina. This time period was when Argentina was under control of a military junta. The leadership of the junta lasted from 1976-1983 and it was the last dictatorship in Argentina. During this time the people of Argentina lost all of their human rights. People weren't allowed to speak out against the junta military government. They had to comply with the junta or face punishment, even death. Upwards of 9,000 people, known as the desaparecidos, or victims of forced disappearance, were killed by the military government. Many mass graves sites were created to dispose of the bodies. I will touch upon the mass grave site, Sector 134 in the Avellaneda Cemetery, and remains of members of the Manfil family, who were killed by the junta and subsequently buried there. I will discuss how the forensic anthropology analysis of bones contributed to the positive identification of Manfil family members. Generally, this research is important because it brings awareness to political based violence in Latin America and beyond to hopefully bring an end to it. In addition, the data can be used in the prosecution of government and military leaders in politically-based human rights violation cases. Finally, the analysis can also bring closure to surviving family and community members who lost loved ones during Argentina's final military dictatorship.

Immigrants Living in the Shadows of America

Sandra Pineda

Prof. Helen Blouet, Faculty Advisor

Immigration will continue to be a long-standing issue in the United States as our understanding behind immigration is still very unclear. To fully grasp the implications of immigration and the consequences of traveling to the United States, we must first understand the government policies and prejudice that impacts the daily lives of these individuals. I will explain the interviews and autobiographical experiences that constructed my research project, while also exploring why the United States misinterprets and under-represents the stigma that surrounds immigration.

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The following are members of the Organizing Committee for the 2019 Student Conference for Research, Professional Activities, and Creative Arts: Joseph Ribaud, Elizabeth Threadgill, and Alyssa Thomas

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