

Schedule of Events

(WAR) Warfield Hall, Allen Auditorium

(SCI) Science Center Auditorium

**9:00 to
9:45 a.m.**

SESSION ONE (SCI)

Welcome Address by Dean Mary Hendrickson

Moderated by Martina Mellott

Janelle Wills '14

“Quantification of Estradiol in Bovine Milk from Cattle Fed Diets Supplemented with *Salvia hispanica* and *Linum usitatissimum*”

Cortney Roper '14

“Chemotactic Factors Involved in the Migration and Homing of Canine Adipose Tissue-Derived Mesenchymal Stem Cells”

Emma Echanis '14

“The Effects of Sonic Hedgehog and Overexpression of the DCDC2 Dyslexia Associated Gene on Growth of Primary Cilia in Developmental Cortical Neurons”

SESSION TWO (WAR)

Welcome Address by Assistant Professor Theresa Hoover

Moderated by Amber Heinbaugh

Lilia George '14

“X-Men: Lessons of Difference, Disability, and Inclusivity”

Elizabeth Heyer '14

“The Effect of Women’s Colleges on Female Fictional Characters: A Study of Space, Place, and Masculine Characteristics”

Rachel Coldsmith '14

“Tom Waits: A Revolutionary Poet in the Tradition of William Wordsworth”

Schedule of Events (continued)

**10:00 to
10:45 a.m.** **SESSION THREE (SCI)**
Moderated by Stephanie Walker

Monica Drummond '14

"Effects of Holy Basil, St. John's Wort, and German Chamomile on Fecal Corticosterone Levels in a Rat Model"

Maria Thomke '14

"Environmental Education for the Fulton Farm"

Kisha Pradhan '14

"Environmental Education for the Wilson College Fulton Farm"

**SESSION FOUR (WAR)**

Moderated by Caitlyn Minelli

Ashlee Yealy '14

"Saving Cemeteries with Helping Hands: A Community Preservation Project"

Mallory Sunderland '14

"Despair: A Novella"

Laci Cox '14

"Through the Arts..."

Schedule of Events (continued)

**11:00 to
11:45 a.m.** **SESSION FIVE (SCI)**
Moderated by Jessica Meck

Zina Long '14

"Pickles, Poultry, and Protestors: An Environmental Issue in Millsboro, Delaware"

Derrick J. Group '14

"Pickles, Poultry, and Protestors: An Environmental Issue in Millsboro, Delaware"

Meghan Stine '14

"Habitat Effects on Captive Elephant Reproduction: A Study of Size and Quality of Captive Elephant Habitats for both Asian and African Elephants"

**SESSION SIX (WAR)**

Moderated by Kelly Myers

Victoria Whitbred '14

"The Time Management Differences between Student-Athletes and Non-Athletes"

Cierra Mariano '14

"Does the Number of Languages Spoken and Family Factors Affect Academic Performance?"

11:45 a.m. to 1:00 p.m. **LUNCH RECESS**

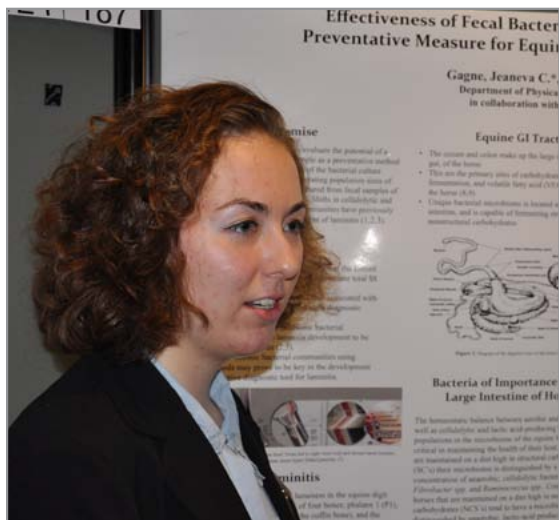
Schedule of Events (continued)

1:00 to 1:45 p.m. **SESSION SEVEN (SCI)**
Moderated by Kotchaphorn Mangkalaphiban

Gillian Barth '14 and Meta Porcella '14
 "Prevalence of Methicillin-Resistant *Staphylococcus aureus* (MRSA) in Equine Nasal Mucosa: A Survey in South-Central Pennsylvania"

Jyotsna Dhakal '14
 "Determining the Effect of Vitamin D Supplementation on Bacillus Calmette-Guérin Vaccine-Induced Immune Response in Guinea Pigs"

Jeaneva Gagne '14
 "Effectiveness of Fecal Bacterial Population Enumeration and Analysis as a Preventative Method for Equine Endocrinopathic and Inflammatory Laminitis"



Jeaneva Gagne '14, presenting her research at the 90th Annual Meeting of the Pennsylvania Academy of Science (PAS) in March 2014.

Schedule of Events (continued)

2:00 to 3:30 p.m. **POSTER SESSION**
 Science Center, Second Floor Front Lobby

- 1 **Brandy Beiter**
"Renal Cancer"
- 2 **Katie Bruner**
"Primary Osteosarcoma"
- 3 **Brenda Bryan**
"Esophageal Cancer"
- 4 **Kayla Croft**
"Cancers of the Lung"
- 5 **Jennifer Issac**
"Ewing's Sarcoma of the Bone"
- 6 **Carolyn Lawrence**
"Ductal Breast Cancer"
- 7 **Daniele Riley**
"Medulloblastoma"
- 8 **David Schofield**
"Duodenal Cancer"
- 9 **Allison Shastay**
"Colorectal Cancer"

Schedule of Events (continued)

2:00 to 3:30 p.m. **POSTER SESSION**
Science Center, Second Floor Front Lobby

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- 10 **Allison Shastay**
"The Effects of Dietary Vitamin E on Colorectal Adenoma Formation and p53 Activation in APC^{min}/APC⁺ Mice"
- 11 **Rebecca Schultz**
"Grey Horse Melanoma"
- 12 **Ghada Tafesh**
"Epithelial Ovarian Cancer "
- 13 **Jessica Meck**
"The Effects of Temperature on the Competitive Interactions between *Pseudogymnoascus destructans* and Native Cave Fungi"
- 14 **Kotchaphorn Mangkalaphiban**
"The Efficacy of Zingerone, Curcumin, and Wedelolactone in Inhibiting the NF- κ B Inflammatory Pathway in Mouse Macrophage Cells: A Comparative Study"
- 15 **Martina Mellott**
"Comparative Analysis of Milk Replacers on Hostein Bovine Serum Protein Concentration and Development"
- 16 **Stephanie Walker**
"The Effect of Magnesium Supplementation on Anxiety in the Domestic Horse, *Equus ferus caballus*"
- 17 **Amrisha Vaidya**
"Orr Forum 2014: Humanity 3.0"
- 18 **Cheyenne Waslaski**
"Contemporary Media Representations of Children in Foster Care"

Schedule of Events (continued)

2:00 to 3:30 p.m. **STUDENT ART EXHIBIT**
Bogigian Gallery, Lortz Hall

3:45 to 4:15 p.m. **HONORS SESSION (SCI)**
Moderated by Professor Alexander Munson

Amanda Clark
"Mathematical Relationships between Three Branches of Trigonometry"

4:30 to 5:00 p.m. **DISERT SCHOLAR PRESENTATION (SCI)**
Moderated by Professor Carl Larson

Morgan Shadle
"Effect of Autonomy, Relatedness, and Competence during Community Service on Prosociality"

5:00 to 5:45 p.m. **RECEPTION**
Science Center, First Floor Front Lobby

6:00 p.m. **ACADEMIC AWARDS CEREMONY (SCI)**



THE DISERT SCHOLAR

Morgan Shadle of Chambersburg, recipient of the 2013-2014 Disert Honors Scholarship, will present the results of her research on college community service, motivation and prosociality (voluntary behavior intended to benefit another). Specifically, she investigates the extent to which community service can fulfill a student's need for free choice, social connections and mastery of service activities, and examines how the fulfillment of those needs impacts her or his helpfulness and empathy.

ABOUT THE DISERT HONORS SCHOLARSHIP

The Margaret Criswell Disert Honors Scholarship is awarded at the Academic Awards Ceremony, held each spring, to the student whose proposal for senior advanced study and research is most worthy of support. This prestigious scholarship is made available through the generosity of Margaret Criswell Disert, '20, and is open for competition campus-wide.



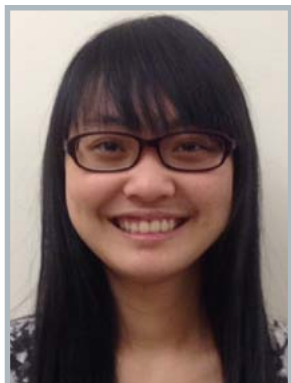
MORGAN SHADLE

DISERT SCHOLAR

Advisors: Carl Larson, Kathleen Kaminski, Rosie Magee, Steven Schmidt, and Elizabeth Anderson

“Effect of Autonomy, Relatedness, and Competence during Community Service on Prosociality”

Researchers have linked certain factors of college community service (e.g., whether the service was mandated or voluntary, whether the students work directly with people in need or not, and the quality of the community service experience) to the development of higher levels of prosocial behaviors and traits. Though researchers have postulated that these factors work to fulfill the students' need for autonomy, competence, and relatedness, as stated by Ryan and Deci's (1985) self-determination theory, there is a need for a study that tests if satisfaction of the needs is indeed mediating between the factors of the community service work and prosociality. In the current study, college students participated in an online survey that included questionnaires on their community service work, needs satisfaction, and prosociality. The expected finding is greater satisfaction of the student's needs (i.e., autonomy, relatedness, competence) will lead to higher levels of prosociality while controlling for the corresponding community service work factor (i.e., mandatory/voluntary work, direct contact with recipients, and quality of service experience, respectively).



KOTCHAPHORN MANGKALAPHIBAN

Advisors: Rebecca Smith and Laura Altfeld

“The Efficacy of Zingerone, Curcumin, and Wedelolactone in Inhibiting the NF- κ B Inflammatory Pathway in Mouse Macrophage Cells: A Comparative Study”

Inflammation is a protective response to infection by the immune system that requires communication between different classes of immune cells to coordinate their actions. Acute inflammation is an important part of the immune response, but chronic inflammation can lead to a destruction of tissues in autoimmune disorders, and perhaps, neurodegenerative or cardiovascular diseases. Recently, natural products have become a popular area of research because they have been traditionally used to treat medical conditions for thousands of years with minimal side effects. Among them, ginger (zingerone), turmeric (curcumin), and false daisy (wedelolactone) have been tested for their anti-inflammatory properties, specifically the NF- κ B pathway, by preventing the phosphorylation and degradation of its inhibitor, I κ B. In this comparative study, the efficacy of each compound in reducing the inflammatory response in mouse macrophage cell lines will be analyzed. Mouse macrophage cells will be induced for inflammation by bacterial lipopolysaccharide (LPS), or endotoxin. The cells will be treated with various concentrations of each compound before or after being stimulated by LPS. The activity of NF- κ B protein subunits, p50 and p65, will be determined using enzyme-linked immunosorbent assay (ELISA). The level of I κ B and phosphorylated I κ B will be determined by Western blotting. The effects of the compounds on inflammation will be assessed and compared using Student's t-test and ANOVA with the p value of 0.05. It is expected that since each compound has a different molecular structure, there will be differences in efficacy. Curcumin will have a greater efficacy than zingerone and wedelolactone because it has more methoxyphenol complexes than the other two compounds.

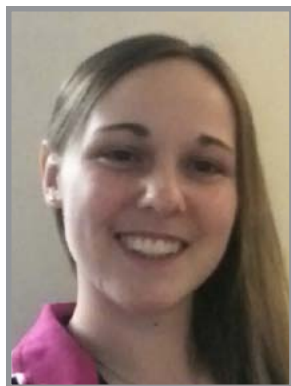


MONICA DRUMMOND

Advisors: Rebecca Smith and Deb Austin

“Effects of Holy Basil, St. John's Wort, and German Chamomile on Fecal Corticosterone Levels in a Rat Model”

Experiencing high levels of the stress hormones cortisol or corticosterone, particularly for extended periods of time, can cause numerous health issues in an organism. Many herbs are thought to have the ability to reduce the levels of stress hormones. This study focuses on three herbs *Ocimum sanctum* (holy basil), *Hypericum perforatum* (St. John's wort), and *Matricaria chamomilla* (German chamomile). Two different types of herbal extracts, commercial supplements and freshly prepared ethanolic extracts, were used to study the effects of the three herbs on rat corticosterone levels. Each herbal extract was given orally, via a micropipette, to female Sprague Dawley rats (n=20), who subsequently received subcutaneous corticosterone injections. The fecal matter from each rat was collected, corticosterone extraction was performed, and competitive enzyme-linked immunosorbent assay (ELISA) was used to quantify the corticosterone levels. The ELISA analysis showed that corticosterone was present in all of the fecal samples; however, preliminary analysis does not reveal any trends which demonstrated that the herbs have a reductive effect on corticosterone levels. Future research, such as studying the effects of long term administration of the herbs, could help support the hypothesis that holy basil, St. John's wort, and German chamomile can reduce the levels of stress hormones.



JESSICA MECK

Advisors: Laura Altfeld and Brad Engle

“The Effects of Temperature on the Competitive Interactions between *Pseudogymnoascus destructans* and Native Cave Fungi”

White Nose Syndrome in the United States has resulted in the death of millions of bats. The syndrome is caused by an invasive fungal species from Europe called *Pseudogymnoascus destructans*. *P. destructans* grows in the caves where bats hibernate during the winter months along with other cave growing fungi. Due to its ability to grow in cold temperatures and effectively use resources, *P. destructans* grows not only around the cave floor and walls, but also on the bat’s muzzles and wing membranes. This results in the disturbance of the bat’s hibernating cycle which leads them to burn their fat reserves quicker and starve to death. While much research is being focused on the effects of *P. destructans* on bats, little is known about the ecological impacts *P. destructans* has on the native cave fungi. My research will be studying the competitive interactions between *P. destructans* and five native cave fungi: *Aspergillus versicolor*, *Aspergillus niger*, *Penicillium chrysogenum*, *Cladosporium cladosporioides*, and *Aspergillus fumigatus* in order to determine whether, and under what conditions, *P. destructans* is a superior fungal competitor. Competitive trials will be conducted in which each of the native cave fungi will be paired with *P. destructans* on Sabouraud’s dextrose agar plates and grown at four different temperatures: 11°, 15°, 25°, and 30° C for five weeks. During that time, area of growth will be recorded every week and at the end of the five week time period it can be hypothesized that the better competitor will have the greatest area. Given the cold tolerance of *P. destructans*, I predict that it will be outcompeted for resources as the temperature increases. Additionally, I will be collecting samples from local caves with the Pennsylvania Game Commission to determine the local fungal diversity.



MARTINA MELLOTT

Advisors: Dana Harriger and Deb Austin

“Comparative Analysis of Milk Replacers on Holstein Bovine Serum Protein Concentration and Development”

There are approximately 55,000 dairy farms across the United States, each cow producing roughly six and a half gallons of milk per day (Thiesse 2012). Each of these cows also gives birth to a calf after the age of two. These calves have to be fed the proper quality of colostrum after birth, as well as milk or milk replacer to ensure a healthy growth and prevention from disease. This study measures the quality of each mother’s colostrum before feeding to the newborn calf, using a Brix refractometer. After the third feeding of colostrum, five different milk replacers will be fed to the two day old calves. The blood serum of all the calves will be tested using both a refractometer and an IDEXX machine to determine the level of total protein. Analysis will include comparing levels of protein with the type of milk replacer that was fed to the calves. It is anticipated that calves fed Calvita 22/15 will have the greatest amount of total protein in their blood serum.



ALLISON SHASTAY

Advisors: Brad Engle and Rebecca Smith

“The Effects of Dietary Vitamin E on Colorectal Adenoma Formation and p53 Activation in APC^{min}/APC⁺ Mice”

Colorectal cancer is the second leading cause of cancer and with no cure, many are turning to supplemental diets to help boost their bodies' ability to fight the cancer. Antioxidants often become the supplement of choice since many have been shown to have anti-cancer properties. Antioxidants lower the amount of DNA mutating Reactive Oxygen Species (ROS) in the body causing a reduction in the amount of p53 produced. p53, which is a known tumor suppressor gene, creates a protein that controls cell growth and division, which is mutated in several cancers including colorectal. By lowering the levels of damaging ROS, and therefore, down regulating the production of the p53 protein, antioxidants may actually cause cancers to develop faster in patients with early precancerous lesions. Another gene often found to be mutated in patients with colorectal cancer is the Adenomatous Polyposis Coli, or APC, gene. This gene helps to keep colon stem cells from migrating to the colon surface, which could expose them to mutagenic chemicals and lead to uncontrolled growth, forming polyps. Mice with altered APC genes are more susceptible to the formation of these polyps. In this study, APC^{min}/APC⁺ mice will be fed diets with altered Vitamin E content: high, low, and normal. After the study, polyps in the colons of the mice will be counted. This study aims to show that the popular antioxidant, Vitamin E, may play a crucial role in the advancement of early precancerous colon polyps to tumors at a faster rate than is usually observed. Groups supplemented with Vitamin E should show a higher cancer rate than groups with a low Vitamin E diet.



STEPHANIE WALKER

Advisors: Deb Austin and Dana Harriger

“The Effect of Magnesium Supplementation on Anxiety in the Domestic Horse, *Equus ferus caballus*”

In the United States, there are over 9.2 million horses and the industry has approximately a \$102 billion impact on the United States economy. Approximately three quarters of horse owners feed their horses dietary supplements. Magnesium is a common supplement used to calm horses. Magnesium deficiencies are becoming more common among horses due to acid soil, soft water, and increased fertilization of fields that provide forage for horses. This study will test the prevalence of magnesium deficiency in the horse population at a specific location in South Central Pennsylvania as well as the effect that magnesium supplementation has on the level of anxiety horses exhibit. Anxiety or stress will be defined as a result of cortisol levels in fecal samples and magnesium levels will be evaluated by blood serum concentrations and the urinary fractional clearance of magnesium. A minimum of six horses will be supplemented with 5 and 15 mg / kg body weight / day for 45 days each with horses being randomly assigned which treatment they will receive first. After the 90 days, horses will be switched to the other treatment in order to compare the results of different doses of magnesium. Magnesium and cortisol levels will be tested one week prior to supplementation, the day before supplementation, and on days 15, 30 and 45 of supplementation for both treatments.



EMMA ECHANIS

Advisors: Dana Harriger and Brad Engle

“The Effects of Sonic Hedgehog and Overexpression of the DCDC2 Dyslexia Associated Gene on Growth of Primary Cilia in Developmental Cortical Neurons”

Abnormal primary cilia (Pc) growth in cortical neurons during development has been linked to many neurologic disorders, such as Dyslexia and Attention Deficit Hyperactivity Disorder. Increased expression of DCDC2, Dyslexia associated gene, has been shown to stimulate elongation of Pc in developmental cortical neurons and increase extracellular concentrations of Sonic Hedgehog (Shh). To determine whether increased extracellular concentration of Shh and/or the overexpression of the DCDC2 gene causes abnormal neural outgrowth, an in vitro study using E17 rat cortical neurons and cell culture techniques was performed. Half of the cell cultures were transfected with cDNA containing a DCDC2-GFP construct, and half were transfected with a control GFP plasmid. Then, half of each transfection group was placed in unaltered cell culture media, and the remaining groups were placed in media supplemented with Shh. After 3 days, the cells were fixed and stored at 4°C. Immunofluorescence targeting of MAP2 and gamma-tubulin was used for visualization and z-axis imaging of the neuronal processes. Data from the images will be evaluated for Pc growth and general cellular outgrowth. If extracellular Shh is linked to abnormal neural outgrowth, then cell cultures containing Shh, overexpressed DCDC2 or both should exhibit abnormal neural outgrowth. However, if Shh is not linked to abnormal neural outgrowth, then only cultures with overexpressed DCDC2 will exhibit abnormal neural outgrowth. Results from this study may help to elucidate the mechanisms related to abnormal neural migration, and assist in future efforts to identify and treat the disorders that may be linked to these abnormalities.



JANELLE WILLS

Advisors: Deb Austin and Dana Harriger

“Quantification of Estradiol in Bovine Milk from Cattle Fed Diets Supplemented with *Salvia hispanica* and *Linum usitatissimum*”

Each year, 300,000 people in the United States are diagnosed with breast cancer and 44,000 die from the disease (American Cancer Society, 2013.) It is the leading cause of cancer deaths among American women aged forty to fifty-five years. One key factor in the development of breast cancer is elevated levels of estrogen. Studies have indicated that levels of hormonal estrogen can be lowered by phytoestrogens. Chia (*Salvia hispanica*) and flax (*Linum usitatissimum*) contain high levels of phytoestrogens in their seed embryo. In this study, Holstein dairy cows were given chia or flax seed to supplement their standard diet for 30 days. Whole milk samples were collected daily during this period. The milk samples were aliquoted and frozen at -80°C until analysis. Samples were then thawed and an ELISA was conducted to quantify the estradiol concentration levels. The data were then analyzed using ANOVA at significance level of .05 to determine which diet more effectively decreased the amount of estradiol. No observable trends were seen throughout the data; however, less variation in estradiol concentration was seen within the chia group compared to that of the flax and control groups. Future research may include feed additives using an animal model and their relationship to improving human health. This could provide consumers an option, when purchasing milk, to lower their estradiol levels and decrease their risk for cancer naturally.



JEANEVA GAGNE

*Advisors: Dana Harriger and Laura Altfeld**

“Effectiveness of Fecal Bacterial Population Enumeration and Analysis as a Preventative Method for Equine Endocrinopathic and Inflammatory Laminitis”

This preliminary study was carried out in two components to determine the practicality of using a fecal bacterial culture as a preventative method for laminitis. In the first part of this study, ten fecal samples were collected; five from laminitic horses and five from non-laminitic horses. Tenfold serial-dilutions of these samples were made and cultured on nutrient agar. From these cultures, unique colonies were isolated, identified using gram staining, and their rate of growth over a period of 48 hours was measured using optical density measurements. In the second part of this study, the fecal samples that were diluted to 1×10^{-1} were cultured on IECA plates for a period of 48 hours anaerobically to determine what facultative anaerobes were present in each fecal sample. Colony morphology and Gram staining were used to identify bacteria cultured in this part of the study. Ultimately, the findings of this study can be used to assess if bacterial cultures from fecal samples could serve as a viable representation of the hindgut microbiome.

** In collaboration with Kurt D. Hankenson, and Julie Engles, New Bolton Center, School of Veterinary Medicine University of Pennsylvania*



JYOTSNA DHAKAL

Advisors: Brad Engle and Dana Harriger

“Determining the Effect of Vitamin D Supplementation on Bacillus Calmette-Guérin Vaccine-Induced Immune Response in Guinea Pigs”

The reduced efficacy of the Bacillus Calmette-Guérin (BCG) vaccine at close proximity to the equator is not fully understood. Ultraviolet radiation exposure a few days before or after BCG vaccination impairs BCG-induced resistance against tuberculosis in guinea pigs. A possible explanation for this could be the greater production of vitamin D due to enhanced sunlight exposure near the equator. Clinical studies suggest that vitamin D enhances immunity against mycobacteria, and that vitamin D deficiency is associated with susceptibility to active tuberculosis. Furthermore, vitamin D suppresses BCG proliferation in vitro. Paradoxically, in vitro studies indicate that vitamin D inhibits Th1 mediated immunity, a crucial component of the immune response against mycobacteria. These properties suggest that vitamin D could impair the efficacy of BCG either through antimicrobial activity against BCG or by restricting the immune response produced following vaccination. The aim of this study was to investigate whether vitamin D impairs the protective efficacy of BCG. Guinea pigs were given weekly doses of 1000 IU or 2000 IU vitamin D supplementation orally for 12 weeks. On the fifth week of vitamin D administration, animals were vaccinated with BCG. Seven weeks after BCG vaccination, a whole blood assay using Mycobacterium tuberculosis purified protein derivative was employed to generate IFN- γ responses. IFN- γ levels in the culture supernatants were quantified by ELISA. Results suggest that vitamin D impairs the efficacy of BCG in a dose-dependent manner, and that the dose response curve has an optimum. The impairment of BCG by vitamin D could be an explanation for the variable efficacy of BCG with geography.



MEGHAN STINE

Advisors: Laura Altfeld and Deb Austin

“Habitat Effects on Captive Elephant Reproduction: A Study of Size and Quality of Captive Elephant Habitats for both Asian and African Elephants”

Acyclicity, or abnormal reproductive cycle, is a problem in captive elephants. The reason for this is unknown; however, if it is not addressed, captive elephant populations may die out. It is possible that acyclicity is due to environmental stress, including insufficient space in zoos and small group size of the captive elephants, leading researchers to ask whether it is more important to have a large quantity of space or a higher quality of space. This research is designed to address the effects of the size of captive environment on the reproductive status of female elephants. Surveys were sent to 66 zoos in Europe and the United States, asking for information regarding number, type, and sex of elephants, reproductive status, and total area of habitat. Behavioral observations were then conducted at five of the participating zoos within the United States. Biotic and abiotic variables were correlated with reproductive status as reported in surveys. Ethogram data from behavioral observations were quantitatively analyzed using cluster analysis on three categories of behavior: basic, social, and contact. The results indicate that specific size of the habitat does not have a direct effect on the reproductive status, but species and age of elephant did show differences in reproductive status. Social structure and behavior, however, varied based on the area of the captive environment. The results suggest that social structure and behavior of captive elephants can be manipulated through maintenance of the captive environment, and may lead to differences in the reproductive status of those females within the habitat.



CORTNEY ROPER

Advisors: Brad Engle and Laura Altfeld

“Chemotactic Factors Involved in the Migration and Homing of Canine Adipose Tissue-Derived Mesenchymal Stem Cells”

Canine adipose tissue-derived mesenchymal stem cells (cAdMSCs) have the capability of differentiating into osteocytes to form new bone and can be transplanted into an area of injury to elicit healing. However, the signaling molecules and homing mechanisms involved with cAdMSC migration to damaged sites in bone are poorly understood. The objective of this study was to test the effectiveness of several critical growth factors known to be released from damaged bone, including two chemotactic factors, platelet derived growth factor (PDGF) and transforming growth factor-beta (TGF- β), and two osteogenic factors, bone morphogenetic protein (BMP) and vascular endothelial growth factor (VEGF). Adipose tissue was collected from canines that underwent ovariectomies and harvested for mesenchymal stem cell (MSC) isolation. The MSCs were allowed to expand and maintained in cell culture (37°C; 5% CO₂). The chemotaxis of cAdMSCs toward the growth factors was observed using an in vitro, transwell, cell migration assay. Following a 48 hour incubation period, the migratory cells were fixed, stained and counted using a digital imaging system. Results showed that PDGF elicited the greatest migratory effect, whereas BMP, VEGF and TGF- β had more limited effects. Furthermore, a novel finding of this study showed that a combination of PDGF and BMP produced an even greater migratory capacity, possibly indicating a synergistic effect. Results from this study contribute to a better understanding of the signaling molecules and homing mechanisms responsible for cAdMSC migration to damaged sites in bones and/or joints, and ultimately may help in the development of more effective delivery methods and regenerative therapies using cAdMSCs.



MALLORY SUNDERLAND

Advisor: Michael Cornelius

“Despair: A Novella”

The work “Despair” is a long short story—or short novella. It is of the science fiction genre with elements of fantasy. The perspective of the piece was inspired by author Robert Jordan, while the concept for the setting was motivated by Anne McCaffery’s Acorna series. “Despair” is the story of Khriin, the world of the peaceful Saethens. The protagonist, Veramir, is born with a genetic anomaly that gives her chaotic abilities that are uncontrollable without a “partner.” She finds herself stuck between the world she wants to know and safety within the walls of the Citadel. When a new species visits and news of their destructive capabilities are realized, the Saethens are overwhelmed. They are given a choice; relocate to a new world or stay; abandon all they know or lead lives dictated by these “humans.” Veramir struggles to find a way to exist in the chaos and to find a purpose in her life.



RACHEL COLDSMITH

Advisor: Larry Shillock

“Tom Waits: A Revolutionary Poet in the Tradition of William Wordsworth”

Many scholars in English studies consider William Wordsworth to be the most important poet since the renaissance. His poems in *Lyrical Ballads* (1798) consolidate literary romanticism and begin “modern poetry, the poetry of the growing inner self” (Bloom 125). Throughout the preface to the second edition, Wordsworth defines his project as being experimental and revolutionary. Henceforth ordinary speech will take the place of elevated poetic diction, and the lives and occupations of marginal characters will come to the fore. My project aligns the revolutionary simplicity championed in *Lyrical Ballads* with the work of Tom Waits, a musician whose songs span traditional ballads, blues, jazz, and folk. As an heir of Wordsworth’s romanticism, Waits focuses on addicts, drifters, sailors, writers, and other city-folk so that he might use the industrial soundscape to show how otherwise marginal lives find dramatic self-expression in the modern city.



MARIA THOMKE

Advisor: Edward Wells

“Environmental Education for the Fulton Farm”

Designing educational programs for school age students and community members at Wilson College’s Fulton Farm. This will include various environmental topics, such as composting, watershed management, sustainable energy, and organic farming, with a focus on experimental learning.



KISHA PRADHAN

Advisor: Edward Wells

“Environmental Education for the Wilson College Fulton Farm”

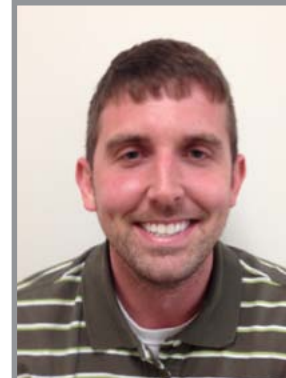
Designing educational programs for school age students and community members at Wilson College Fulton Farm. This program will include various environmental topics, such as rainwater, composting, sustainable energy and organic farming, with the focus on experimental learning.

ZINA LONG

Advisor: Edward Wells

“Pickles, Poultry, and Protesters: An Environmental Issue in Millsboro, Delaware”

The objective of this research is to provide information that opposes the establishment of a proposed chicken processing facility in Millsboro, Delaware. Information and data were gathered through personal interviews, site visits, scientific studies, and other scholarly sources. Working in conjunction with the other students in the Environmental Studies senior capstone seminar, this project seeks to provide prospective audiences with factual information to encourage the development of individual opinions pertaining to this controversial environmental issue.



DERRICK J. GROUP

Advisor: Edward Wells

“Pickles, Poultry, and Protesters: An Environmental Issue in Millsboro, Delaware”

The objective of this research is to provide information that favors the establishment of a proposed chicken processing facility near Millsboro, Delaware. The information and data were gathered in support of the facility through personal interviews, governmental, journalistic, and scholarly sources. Working in conjunction with other students in the Environmental Studies senior capstone seminar, this project seeks to provide prospective audiences with factual information to encourage individual opinions pertaining to a multifaceted environmental issue.

LACI COX*Advisor: Robert Dickson***“Through the Arts...”**

Throughout my life, the arts have always had my back, from dancing at a studio at a young age to singing in high school, and today getting my Bachelors doing photography. For children just starting their lives, this opportunity is disappearing. Viewing images of three arts that matter most to me: Dance, Music, and Studio including Photography, the audience can see how art has helped me become the person I am and the person I will become. These black and white photographs isolate the subjects - dancer's feet and gestures, musical instruments, and studio tools and materials -- for the most intimate presentation. To show my forte, there is a part of me in some of the photographs and those images will be bigger than the others to show the importance to me, the photographer.

“5th Position”*Photo Credit: Laci Cox***AMRISHA VAIDYA***Advisor: David True*

**WILSON COLLEGE
ORR LECTURES 2014**

HUMANITY 3.0
Read the Manual Before Assembly

DR. LAURIE ZOLOTH

Wednesday, April 2
12 - 12:30 P.M.
Wednesday Worship:
The Song of the Leper
ALUMNAE CHAPEL, THOMSON HALL

5 - 6 P.M.
*Ordinary Talk about Ordinary
Trouble: Bioethics, Faith and
Decisions at the End of Life*
BROOKS SCIENCE
COMPLEX AUDITORIUM

Thursday, April 3
9-10:30 A.M.
*Utopia is a Lot of Work:
Freedom, Responsibility and
Medical Research*
BROOKS SCIENCE
COMPLEX AUDITORIUM

WILSON COLLEGE



ASHLEE YEALY

Advisor: Kay Ackerman

“Saving Cemeteries with Helping Hands: A Community Preservation Project”

Cemeteries are the final resting place of millions of people, and in small towns specifically these records of history sometimes fall into disarray. Simple efforts on the part of hired professionals and concerned community members can change the fate of many of these historical sites. Located just a half hour down the road from Wilson College are two unique cemeteries: the Brindle Family Cemetery and the Old Methodist Cemetery, both in the hands of the St. Thomas Historical Society. My research involved the surveying of the land, documentation of the gravestones and burials and lastly the gravestones' conditions. In order for these cemeteries to last for hundreds more years, I have designed a Preservation Manual, specific to these two cemeteries, but capable of being applied to any cemetery under similar conditions. The manual incorporates the community, utilizes volunteer opportunities for service work, and fuels interest in this unique part of their local history. Most important to consider when undergoing such a cemetery preservation project, is to know the do's and don'ts of working in cemeteries and with gravestones. A combination of geology, history, record keeping and thinking quite literally “outside the box” are involved in this project. “Take only photos, leave only footprints” is the key to teaching others how to save our cemeteries for future generations.



ELIZABETH HEYER

Advisor: Michael Cornelius

“The Effect of Women’s Colleges on Female Fictional Characters: A Study of Space, Place, and Masculine Characteristics”

Character development in literature and film is dependent on the setting, interactions, and plot. The setting of a women’s college is unique in its influence on female characters. Even though it is a feminine space, the characters are influenced by the masculine undertones. From the architecture to the courses taught, students were subject to the effects of masculine factors working to challenge female social expectations. Grace Harlowe’s time at Overton, and the women at Wellesley demonstrate how the people and places they are surrounded by have direct correlation to their characters’ development. Yi-fu Taun claims, “the built environment clarifies social roles and relations. People know better who they are and how they ought to behave when the arena is humanly designed” (Tuan 102). What happens however, when the “humanly designed” structures dictate young women behave in a counter-normative manner? By opening the doors of education to women, many women’s colleges unwittingly exposed their students to masculine influences. Both film and literature create a space in which the characters interact and explore, however, as is the case with Grace and Mona Lisa Smile, the setting is often more than a backdrop, but also a key mode of character development and expression. In these texts, masculinity in female students expresses itself through their behavior and post college career choices. Grace is an athletic, adventure-seeking young woman who chose a career over marriage right after college, while the young women of Wellesley struggled with social expectations and personal agency. Thus it is evident that, in these narratives, ideas of masculinity have been adapted and redefined by the social sphere many times. With ever-changing definitions of masculinity and femininity, based on social norms, women’s colleges offer a safe environment for women to explore those definitions and find the balance that works best for them.



AMANDA CLARK

Advisor: Alexander Munson

“Mathematical Relationships between Three Branches of Trigonometry”

This research paper will investigate and develop mathematical relationships between three branches of trigonometric functions: circular, hyperbolic, and catenary. Important identities within each branch, such as the Pythagorean Theorem, will be discussed. Special algebraic properties that exist within the respective trigonometries will also be established and compared.



VICTORIA WHITBRED

Advisor: Steven Schmidt

“The Time Management Differences between Student-Athletes and Non-Athletes”

This study investigates the differences in how student-athletes and non-athletes manage their time. This study will attempt to answer the question “what is the difference in time management use between student-athletes and non-athletes?” From 365 surveys mailed to traditional female students through the Wilson College Post Office, 44 responded (12%). Five types of questions were asked of students that included residency (commuter or resident), employment (on campus or off campus), academics, workload/use of time, and athletics (if on a D3 team, how many teams). Descriptive statistics (sample means and standard deviations) and independent samples t-tests will be used to answer the research question. It is hypothesized that student-athletes will engage more frequently in strategies (scheduling/to-do lists, etc.) to manage their time in comparison with non-athletes.



CIERRA MARIANO

Advisors: Carl Larson and Steven Schmidt

“Does the number of languages spoken and family factors affect academic performance?”

The goal of this research study is to examine the effects of language proficiency and family factors on academic performance. The rationale for conducting this research study is to identify areas of education that might benefit from improved curriculum and course material for college students with low English proficiency who also have low GPA's. One hundred and eleven participants responded to questions to an online survey, which measured family factors (support and socioeconomic status), language proficiency, and grade point average. A t-test will be used to analyze participants' academic achievement based on language proficiencies and family factors. It is hypothesized that students who have unsupportive families and a low English proficiency will have lower GPA scores compared with students with high levels of family support and high English proficiency. Students who only speak English will have the highest GPA's. Equally balanced bilingual students will have the greatest level of family support and GPA's that will likely be similar to the students who speak one language.



LILIA GEORGE

Advisor: Julie Rauli

“X-Men: Lessons of Difference, Disability, and Inclusivity”

This study examines the construction of normativity and social resistance to non-normative traits through a content analysis of the X-Men movies. Messages from the films about difference along gendered, racial, class, and national lines are analyzed. A relational-model of disability is employed to explore the concept of mutants as “others”/outsiders in terms of being differently abled. I propose that the public call to rid mutants of their mutations in the films, rather than expand definitions of what it means to be human, is analogous to current social responses to the “disabled.” Two examples of the way humankind rejects “disability” under the guise of progress are bio-mediation and designer babies. I argue that these responses are regressive and cause conflict because they reinforce what is normative by trying to get people to fit what is considered normal/desirable. Our scientific/medical advancements are developing more rapidly than our ethical considerations; thus, issues will be exacerbated by more biological/physical variation. The need for a moral reform that is inclusive and expands our definition of what it means to be human will be explored. I argue for the necessity of acceptance and celebration of difference since all versions of othering and discrimination operate in the same systemic fashion.

