THE COLLEGE OF ARTS AND SCIENCES

RESEARCH DAY

APRIL 3, 2012

Welcome

On behalf of the College of Arts and Sciences, I welcome all student participants to the Twelfth Annual Student Research Day 2012. The enclosed abstracts by graduate and undergraduate students indicate both the scope and thoroughness of the research undertaken by students within the College. The high quality of research in our College is clearly reflected in these abstracts. I congratulate all student participants and their faculty mentors and wish them success in all their future research endeavors.

Donna M. Murasko, Dean

College of Arts and Sciences

Twelfth Annual College of Arts & Sciences Student Research Day

April 3rd, 2012

COMMITTEE MEMBERS

Jake Russell (chair) – Department of Biology (jar337@drexel.edu)

Lloyd Ackert (co-chair) – Department of History and Politics (lta24@drexel.edu)

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The committee would like to extend a special thank you to Bailey Adams (Administrative Assistant, College of Arts and Sciences) and Deirdre McMahon (Drexel Writing Center).

JUDGES

BIOLOGY

Shivanthi Anandan, Joe Bentz, Laura Duwel, Felice Elefant, Tali Gidalevitz, Gail Hearn, Mesha Hunte-Brown, Karen Kabnick, Bob Loudon, Dan Marenda, Mike O'Connor, Jacob Russell, Elias Spiliotis, Liz Spudich, Jennifer Stanford, Monica Tonga, Jeff Twiss

CHEMISTRY

(Haifeng) Frank Ji, Monica Ilies, Dan King, Kevin Owens, Susan Rutkowsky, Reinhard Schweitzer-Stenner, Kevin Shuford, Alexander Turfa

CULTURE and COMMUNICATIONS

Daniela DePau, Sandy Friedlander, Maria Hnaraki, Theodore Katerinakis, Emmanuel Koku, Joanna Lyskowicz, Rakhmiel Peltz, Lawrence Souder

ENGLISH and PHILOSOPHY

Benjamin Barnett (English Language Center), Anne Erickson, Travis Harman (English Language Center), Rebecca Ingalls, Emilie Passow, Eva Thury, Kathleen Volk Miller, Scott Warnock

HISTORY and POLITICAL SCIENCE

Lloyd Ackert, Kris Alexanderson, Jonathan Seitz, Kathryn Steen, Donald Stevens

MATHEMATICS

Michael Daniel, Bo Dong, Yixin Guo, Dmitry Kaliuzhnyi-Verbovetskyi, Jennifer Morse, Shari Moskow, Ronald Perline, Eric Schmutz, Douglas Wright, Dennis Yang

PHYSICS

Alexey Aprelev, Luis R. Cruz Cruz, Frank Ferrone, Len Finegold, Robert Gilmore, Dave Goldberg, Chuck Lane, Jelena Maricic, Gordon Richards, Som Tyagi, Michel Vallieres, Brigita Urbanc, Michael Vogeley, Jian-Min Yuan

PSYCHOLOGY

Brian Daly, Kirk Heilbrun, Marlin Killen, John Kounios, Michael Lowe, Julia Sluzenski, Mary Spiers, Mike Williams

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Oral Presentations

Aimee Hildenbrand
B.S. Psychology 2012 (minors in Anthropology and Public Health), Drexel University
Accepted into Drexel's Clinical Psychology doctoral program (2012/2013)
Title: *Initial Development and Evaluation of a Web-Based Intervention for Children After Acute Medical Trauma*
Mentor: Jacqueline Kloss
2011 Undergraduate Humanities Winner

Amanda White
B.S. Physics 2011 (concentration in Astrophysics, minor in Mathematics), Drexel University
Title: *Three-Dimensional Analysis of NASA Stardust Tracks*
Mentor: Michael Vogeley
2011 Undergraduate Sciences Winner

Lauren Greenberg
Ph.D. Clinical Psychology 2014, Drexel University
M.S. Psychology 2008, Drexel University
B.S. Psychology 2006, Drexel University
Title: *Problem Orientation as a Mediator of Affect in Collegiate Athletes*
Mentors: Christine Nezu and Arthur Nezu
2011 Graduate Humanities Winner

Avinash Dalal
Ph.D. Mathematics 2014, Drexel University
M.S. Applied Mathematics 2005, University of Maryland at College Park
B.S. Mathematics 2001, Drexel University
B.S. Computer Engineering 2001, Drexel University
Title: *k-Schur Functions*
Mentor: Jennifer Morse
2011 Graduate Sciences Winner

Undergraduate Posters

Presenter(s): Riddhi Amin
Email: rja58@drexel.edu
Major: Biological Sciences
Academic Field: Biological Sciences
Faculty Advisor: Dr. Jacob Russell
Email: jar337@drexel.edu

Identifying Microbial Gut Symbionts of Cephalotes varians via Culture Dependent and Independent Methods

Author(s): Riddhi Amin

Symbiotic relationships have been documented across numerous animal species, and these intimate links affect the reproduction, diet, and the evolution of many organisms. Studies of bacteria inhabiting the guts of the ant, Cephalotes varians have revealed multi-species communities with potential roles in host nutrition. This project sought to isolate microbes of C. varians through optimizing growth conditions and identifying gut microbes with cloning and sequencing. Cultivation of bacteria under varying media environments will allow for further investigation into their exact function in the symbiotic relationship. Furthermore, screening for Fungi and Archaea provides the first attempts to survey for microbes outside of the Eubacteria via culture-independent methods. Sequences from three different cultured bacterial species isolated from C.varians suggested that the gut contains rare and previously undiscovered bacteria, such as ones belonging to the genera, Enterobacter and Acinetobacter. However, further research is required to successfully grow the dominant symbiotic microbes identified by culture-independent means. In addition to these Eubacteria, PCR screening suggested the presence of Archaea in C. varians guts through preliminary analysis of gel images. Future research will investigate growth conditions geared toward providing the symbionts with the proper environment needed to be cultured such as adjusting the pH of the agar media. Also, the presence of archaeal and fungal species will be verified by further cloning experiments and sequencing, to establish species' identity. In conclusion, this study has provided insights into microbial communities that colonize the digestive systems of C. varians, hinting at a greater diversity than originally appreciated.

Location: Row - N; Number - 127
Judging Time: 12:30p.m. - 2:00 p.m.

Presenter(s): Ioannis Anastopoulos
Email: ina26@drexel.edu
Major: Biology
Academic Field: Biological Sciences, Environmental Science
Faculty Advisor: Dr. Jacob Russell
Email: jar337@drexel.edu

Root-associated microbes from Biowall plants and their roles in VOC degradation

Author(s): Ioannis Anastopoulos

Volatile Organic Compounds (VOCs) are airborne contaminants, which degrade the quality of indoor air. VOCs such as benzene and acetone are emitted from a diversity of products, such as paint, vanishes, or wax, and are consistently found at higher concentrations indoors. These chemicals are of special concern due to their potential effects on health—while effects may include skin and eye irritations, VOCs are also associated with elevated risks of cancer and immunological disorders. Current methods of reducing the concentration of indoor VOCs involve ventilating indoor space with outdoor air. Yet a novel approach for the improvement of indoor air quality involves the use of Biowalls, vertical arrays of plants, which act as natural air filters, placed vertically on a wall. As air flows through them, root-associated microbes use VOCs as "food", resulting in purification of the air. In this study we investigated benzene degrading root-associated microbes from plants grown in the Papadakis Integrated Sciences Building. Through cultivation and molecular-based techniques, we identified several fungi and a smaller number of bacteria with a capacity to break down this VOC. Our molecular studies of microbial communities also suggest that there is a wide diversity of microbes, which may aid in VOC degradation and the improvement of indoor air quality.

Location: Row - A; Number - 6 Judging Time: 12:30p.m. - 2:00 p.m.

Presenter(s): Amanda Barbieri Email: amandajane.barbieri@gmail.com
Major: Psychology Academic Field: Psychology
Faculty Advisor: Dr. Pamela Geller Email: pg27@drexel.edu

Gender differences in reactions to infertility discovery and the importance of social support.

Author(s): Amanda Barbieri

Infertility, the inability to achieve pregnancy within 12 months with regular intercourse and without contraceptives, affects approximately 7.4% of heterosexual, married couples in the US and can be caused by unexplained factors or factors pertaining to: the female, the male, or both partners. Both partners are likely to endure high levels of stress and anxiety upon discovery and treatment of infertility; however, females are more likely to experience higher levels of stress and to seek social support. This gender difference could be attributed to the more invasive infertility treatments for women, and the stigma associated with childfree women, among other factors. While enduring the costly and time-consuming infertility treatments, partner and general social support prove to be critical factors in terms of emotional response during treatment and even treatment outcomes. Local support groups for infertility and, in recent years, online communities that target women and couples experiencing infertility, are now readily accessible. Members of online support groups are able to anonymously share their experiences with others at any time of day, providing components of convenience and security that had previously been unavailable.

Ensuring that couples are informed on available social support systems, as well as ensuring knowledge on gender differences surrounding infertility, could significantly improve the experience of infertility and its related treatments by decreasing the feelings of stress, anxiety, and isolation experienced by many infertile couples. This poster will review the relevant literature and propose support resources that may be beneficial for women and couples experiencing infertility in the US.

Location: Row - K; Number - 98 Judging Time: 11:00a.m. - 12:30p.m.

Presenter(s): Mary Bednar Email: mab372@drexel.edu
Major: Biology Academic Field: Biological Sciences
Faculty Advisor: Elias Spiliotis Email: ets33@drexel.edu

Regulation of Cell Adhesion to the Extracellular Matrix by Septin 2

Author(s): Mary Bednar, Lee Dolat, Elias Spiliotis

Cell migration is an important process during development and cancer metastasis. Metastatic cells move in a polarized manner, where the leading-edge protrudes and adheres to the extracellular matrix (ECM). Cell-matrix adhesions form through the integrin family of receptors and connect the actin cytoskeleton to the ECM. Actin bundling and myosin II-mediated contraction provide the force necessary for adhesion growth and translocation. Septins are a novel class of GTP-binding proteins that associate with the actin cytoskeleton. Misregulation of septin expression has been linked to several cancers, and their over-expression promotes cell migration. Because septin 2 (SEPT2) is over-expressed in kidney cancer, we investigated its role in cell-matrix adhesion using confocal microscopy by septin depletion or over-expression in Madin-Darby canine kidney (MDCK) cells. Staining for the focal adhesion marker protein paxillin showed that SEPT2 depletion results in smaller, more numerous adhesions. Furthermore, when SEPT2 was depleted, we observed a two-fold increase in phosphopaxillin relative to the control. Because dephosphorylation of paxillin occurs concomitantly with focal adhesion maturation, which is driven by actomyosin contraction, we hypothesize that SEPT2 functions at the level of actomyosin contraction. Therefore, SEPT2 is required for the maturation of focal adhesions. On-going studies will investigate the effect of SEPT2 over-expression on cell-matrix adhesions, and further define its molecular relationship with actin during cell migration.

Location: Row - G; Number - 62 Judging Time: 11:00a.m. - 12:30p.m.

Presenter(s): Jon Brennan Email: jmb387@drexel.edu
Major: Physics Academic Field: Physics
Faculty Advisor: Dr. Robert Gilmore Email: gilmorer@drexel.edu

The Lorenz Map, The Logistic Map, And All Of The Maps In-between

Author(s): Jon Brennan

The logistic map is one of the most well-studied maps in all of Nonlinear Dynamics. The properties of the logistic map are well-known. The Lorenz map, on the other hand, is not understood with the same clarity. The Lorenz map describes trajectories in the Lorenz attractor and I will show, with the help of two intermediate nonlinear maps, that the properties of the Lorenz map are similar to the properties of the logistic map. Thus, the understanding of the properties of the logistic map can be transferred to the more mysterious Lorenz map.

Location: Row - G; Number - 63 Judging Time: 12:30p.m. - 2:00 p.m.

Presenter(s): Frank Bruckerl Email: fab29@drexel.edu
Major: Communication Academic Field: History
Faculty Advisor: Dr. Jonathan Seitz Email: jws66@drexel.edu

When Black Magic Met Science in the Pennsylvania Province: The Untold Story of Philip Roman and Sons

Author(s): Frank Bruckerl

Originally sailing to the Americas from Wiltshire, England, Philip Roman and his family would become well-connected to some of the most important figures in early Pennsylvania history, including William Penn himself. Arriving in 1682, the family quickly became well-respected, obtaining a great deal of land and power in colonial Chester County. Their long list of acquaintances included their fellow Quakers in the Society of Friends, with the local chapter even holding occasional Meetings at the family home. Thirteen years later, in November of 1695, it seems that the Romans became victims of their own success.

It was then that two of Philip Roman's sons found themselves accused of practicing black magic and using forbidden knowledge in order to divine the future. Remarkably, a careful examination of handwritten notes, period artifacts, and legal records reveal that these accusations were actually true -- at least to some degree. Even more substantially, the lines between magic and science become blurred as a curious cast of doctors, mathematicians, blacksmiths, judges and booksellers emerges in this colonial soap opera. In particular, this project outlines the intricate set of circumstances and relationships leading up to (and following) this significant case of two self-confessed early American cunning folk, which might be described as Pennsylvania's answer to the Salem witch trials. When placed under the microscope for the very first time, the Roman case reveals a rare period in American history where areas of science itself were considered by many to be a dark art.

Location: Row - A; Number - 7 Judging Time: 12:30p.m. - 2:00 p.m.

Presenter(s): Casey Burkard Email: cburkard23@gmail.com
Major: Psychology Academic Field: Psychology
Faculty Advisor: Naomi Goldstein Email: neg23@drexel.edu

Late adolescents' risky decision making: Does the legality of behavior matter?

Author(s): Casey Burkard, Sharon Messenheimer Kelley, Naomi E. S. Goldstein

This study investigated decision making in a context in which risk-taking behavior is common and in which adolescents tend to be forthright about making risky decisions-driving. Specifically, this study examined driving behaviors among late-adolescents, comparing decisions about risky, legal behaviors to risky, illegal behaviors. Data from 294 undergraduates revealed that most participants reported engaging in risky driving behaviors (i.e., texting or using an ipod/mp3 player while driving), but some significant differences in the frequencies of legal and illegal behaviors. Implications for late adolescents' abilities to conform behavior to legal standards will be presented, and legal policies will be discussed.

Location: Row - L; Number - 111 Judging Time: 11:00a.m. - 12:30p.m.

Presenter(s): Allison Byrne Email: allison.q.byrne@gmail.com
Major: Environmental Science Academic Field: Environmental Science
Faculty Advisor: Gail Hearn Email: gwh26@drexel.edu

Distribution and Abundance of Frogs at Moka Wildlife Center, Bioko Island, Equatorial Guinea

Author(s): Allison Byrne, Jacob Owens, Gertrutis Ribado, Gail Hearn

Despite the high threat facing amphibian species worldwide, little is known about the status of frog populations on Bioko Island, Equatorial Guinea. This project adds to the baseline studies conducted on frogs on Bioko Island by assessing the density and abundance of frog species in the area surrounding the Moka Wildlife Center. In addition, this study sought to evaluate the efficacy of three commonly used frog census techniques, including day and night surveys and the construction of artificial pools (large and small). During this research project 6 genera and 11 species were encountered over 10 days of field work. Frogs from the genus Arthroleptis had the highest encounter rates, and the three species from this genus were found in distinct elevation ranges. The Cascades trail, a riverine trail at a lower elevation, yielded the highest level of species diversity and had an

encounter rate of 3.25 frogs/km. The Lago Biao trail, a dry, open trail at a high elevation, had the highest frog encounter rate (3.73 frogs/km). The artificial pool method yielded no frog encounters and was found to be an ineffective short-term sampling method for this area; however it was found that natural pools and rain barrels around Moka Wildlife Center are frequently colonized frogs of the genus Hyperolius.

Location: Row - I; Number - 78 Judging Time: 11:00a.m. - 12:30p.m.

Presenter(s): Aja Carter Email: amc434@drexel.edu
Major: Biology Academic Field: Biological Sciences
Faculty Advisor: Kenneth Lacovara Email: lacovara@drexel.edu

A juvenile Hyposaurus rogersii skull from the Hornerstown Formation of New Jersey

Author(s): Aja Carter, Zachary Boles, Elena Schroeter, Kenneth Lacovara

Recent excavation in the Hornerstown Formation of Mantua Township, Gloucester County, New Jersey, has yielded a plethora of marine vertebrates, including a partial skull consisting of a complete braincase, associated fragments, and two teeth. We assigned the material to Hyposaurus rogersii based on the following characteristics: 1) braincase exhibits a flat ventral margin of the magnum foramen, resulting in a shunted occipital condyle that is very short; 2) the jugal curves ventrally relative to the dorsal margin of the brain case; 3) tuberosities are present on both sides of the dorsal-most lateral line on the supraoccipital, and; 4) a flattened parietal-frontal complex. The combination of these characteristics are diagnostic of Hyposaurus. The lack of fused skull joints, indicates this specimen to be a juvenile H. rogersii. This material represents an individual of intermediate size, relative to three previously reported specimens, and provides insight into osteological changes in the skull of H. rogersii through ontogeny.

Location: Row - F; Number - 54 Judging Time: 11:00a.m. - 12:30p.m.

Presenter(s): Greg Chase Email: gc336@drexel.edu
Major: Physics Academic Field: Physics
Faculty Advisor: Gordon Richards Email: gtr@physics.drexel.edu

Methods for Identifying High Redshift Quasars

Author(s): Greg Chase

The Spitzer Space Telescope and the SDSS 2.5m telescope at the Apache Point Observatory filter light from millions of objects in space and collect the data associated with that light.

The light emitted by a quasar is very specific but is altered by its redshift. The standard infrared selection methods for quasars does not include quasars of higher redshifts. Using the data from light in the optical range and mid-infrared range, unknown objects are compared with known quasars. The data is analyzed to obtain a process for selecting high redshift quasars.

Location: Row - E; Number - 47 Judging Time: 11:00a.m. - 12:30p.m.

Presenter(s): Linh Chau Email: lmc83@drexel.edu
Major: Biological Sciences Academic Field: Biological Sciences
Faculty Advisor: Dr. Jacob Russell Email: jar337@drexel.edu

Characterization of the Gut Bacterial Communities of the Invasive Argentine Ant Across Geographic Ranges

Author(s): Linh Chau, Yi Hu, Dr. David Holway, Dr. Jacob Russell

The invasive Argentine Ant (Linepithema humile), which is native to South America, has established supercolonies throughout the world. The introduction of these highly aggressive ants has led to problems for native animals. In introduced regions, L. humile feeds extensively on “honeydew”, a nutrient poor excrement produced by sap feeding insects. Previously, it has been hypothesized that a reliance on such nutritionally poor diet may create a need for nutritional supplementation by symbiotic gut bacteria. To initiate a test of this hypothesis, we have begun to characterize the gut bacteria of Argentine Ants (L.humile) from different supercolonies collected at four sites in California. To characterize the bacterial communities within guts and whole ants, we “genotyped” the 16S rRNA gene using T-RFLP and 454 pyrosequencing. Preliminary results with both methods show that ants from different locations harbor similar gut microbial communities. In particular, T-RFLP analyses show a sharing of particular fragment sizes, suggesting that there are similar bacterial species present in the guts of L.humile workers from different geographic locations. And in addition, 454 pyrosequencing of the 16S rRNA gene shows that four major bacterial families are present in guts of Argentine ants. Future studies on this system will aim to illuminate the evolutionary histories and functional significance of the associations between the identified bacteria and their destructive ant hosts.

Location: Row - C; Number - 23 Judging Time: 11:00a.m. - 12:30p.m.

Presenter(s): Brian Cohen Email: bac52@drexel.edu
Major: Physics Academic Field: Physics
Faculty Advisor: Jian-Min Yuan Email: yuanjm@drexel.edu

A Potts-Model Study of Protein Conformational Changes

Author(s): Brian Cohen

Our project here is to study the kinetics of conformational changes of a protein or a peptide. In particular, we are interested in studying the transformations between an alpha-helical structure and a beta-sheet structure, the so-called alpha-beta transitions. A very simplified model of protein that we shall use is a 3-state Potts model, in which a one-dimensional chain of residue states (either in alpha helix, beta sheet, or random coil) is used to represent the conformational states of the protein. The three states of individual residues are determined by the ranges of their dihedral angles. Our model is a generalization of the two-state Ising model, which uses a regular array of spin-up and spin-down elements. To calculate the kinetics of this system, one very useful and accessible tool is simulation in-silico.

Our simulation is based on a Markov chain dynamic, so at any given moment the prior history of the process has no relevance in governing future dynamics, only the current state. This allows us to use a class of algorithms called Monte-Carlo Markov Chain algorithms. A fairly easy to implement version of this would be the Metropolis-Hastings algorithm, which picks a random peptide bond along the chain and changes it to a random state, and rolls dice to determine whether to accept or reject the conformational change. We have obtained so far some interesting results which show the competition between helical, sheet, and coil structures as a function of time and temperature. However, this was found to lead to trapping at local minima. This motivates the implementation of more advanced algorithms, in particular, the Replica exchange method, in which systems are swapped based off a roll of the dice and the energy between parallel systems at different temperatures.

Location: Row - E; Number - 43 Judging Time: 11:00a.m. - 12:30p.m.

Presenter(s): Suli Deng Email: sstang1023@gmail.com
Major: Business Administration Academic Field: Psychology
Faculty Advisor: Eva Thury Email: thury@drexel.edu

Analysis of Chinese Parenting Related to Tiger Mother

Author(s): Suli Deng

After reading Battle Hymn of the Tiger mother by Amy Chua, I decided to do a project on Chinese parenting. Chinese parents tend to be strict with their children. However, there is difference between Mainland Chinese parenting and Chinese American parenting. I launched this study for a better understanding of Chinese parenting in these two different areas. I found that Chinese American young adults perform better at school than European

American young adults, but their parents are rather more authoritarian. However, studies showed that first-generation Chinese parents have slightly shifted their parenting from authoritarian to authoritative. They adapted American culture to their Chinese culture in raising their children. In Mainland Chinese family, Confucian principles have significant impacts on family interactions and relationships. Chinese mothers showed higher parental control and child-rearing ideologies. They believe the best way to protect their children is to prep are them for the future and arm them with skills, strong work habits, and inner confidence. In addition, one-child policy drives parents in Mainland China to have higher expectations on their children. So, they tend to put more pressure on their children and hope they achieve the goals they set, which leads to authoritarian parenting. I concluded that the effectiveness of a parenting style should be defined relative to cultural context. A child's success is a combination of parenting and social environment. Parenting style should change if social environment changes. In fact, authoritarian parenting is not necessarily beneficial for every Chinese young adult. There are always exceptions.

Location: Row - K; Number - 94 Judging Time: 12:30p.m. - 2:00 p.m.

Presenter(s): Lauren Donaghy Email: lid26@drexel.edu
Major: Environmental Studies Academic Field: Environmental Science
Faculty Advisor: Harold Avery Email: haltort@aol.com

Color Variation in Diamondback Terrapins (Malaclemys terrapin) in Relation to the Anthropogenically Impacted Visual Environment

Author(s): Lauren Donaghy, Kevin Biallis, Abigail Dominy, Harold Avery

Conspecific recognition is an important component in intraspecific communication. Changing visual environments may affect the ability of wildlife to find and identify potential mating partners. Barnegat Bay, NJ is increasingly threatened by anthropogenic degradation. Native aquatic species face steadily changing water conditions, such as increased eutrophy and turbidity from high levels of watercraft activity. These alterations in water conditions directly impact the visual capabilities and behaviors of the diamondback terrapin (Malaclemys terrapin), a Species of Special Concern in the state of New Jersey. Reflectance spectra were measured on captured terrapins during the summer of 2011. Spectrophotometric data were processed through the MATLAB program TETRACOLORSPACE, as modified from Stoddard and Prum (2008), to calculate chromatic values. Chromatic values of seven distinct anatomical sampling points on the skin, carapace and plastron were calculated and compared in different ambient light environments to model light attenuation that results from decreased ambient light quality. Our results indicate that increasing light attenuation causes a decrease in the perceived chromatic values expressed on the terrapin. Understanding the visual environment of the diamondback terrapin provides insight into the behavior of the species, which is imperative in developing conservation and management programs for threatened wildlife.

Location: Row - M; Number - 113 Judging Time: 11:00a.m. - 12:30p.m.

Presenter(s): Jenna Ebbecke Email: jenna.ebbecke@gmail.com
Major: Psychology Academic Field: Psychology
Faculty Advisor: Naomi Goldstein Email: neg23@drexel.edu

Interrogative Suggestibility and Academic Achievement: The Relationship with Reading and Listening Comprehension

Author(s): Jenna Ebbecke, Lindsey Peterson, Sadia Rharbite, Ana Prelic, Naomi E. S. Goldstein

The majority of juvenile suspects have histories of academic problems and poor school performance. However, little research has examined the relationship between interrogative suggestibility and academic achievement. Consequently, this study examined such data from 77 youth in pre-and post-adjudication facilities. Results revealed a significant relationship between reading and listening comprehension on the Wechsler Individual Achievement Test (WIAT) and yield scores on the Gudjonsson Suggestibility Scale (GSS), but not between WIAT and GSS shift scores. Oral expressive abilities were unrelated to suggestibility. Implications of these findings for interrogation procedures with youthful suspects will be presented, and limitations will be addressed.

Location: Row - D; Number - 38 Judging Time: 12:30p.m. - 2:00 p.m.

Presenter(s): Danielle Fagnani Email: def32@drexel.edu
Major: Chemistry Academic Field: Chemistry
Faculty Advisor: Jun Xi Email: jx35@drexel.edu

Investigating Structural Changes to Green Tea Extract (EGCG) by Monitoring the Effect on Cells Using QCM-D

Author(s): Danielle Fagnani, Dr. Jun Xi, Marcela Garcia, Jennifer Chen

Epigallocatechin gallate (EGCG) is one of the most abundant and potent antioxidants found in green tea. Research has shown that this compound displays many cancer preventative effects on cells. EGCG contains many hydroxyl functional groups that can be converted to ester groupings by chemical derivatization to make the molecule more hydrophobic. This may increase cell permeability of EGCG and possibly increase its potency. In this study, we compared the biological effects of EGCG and ECGG-peracetate on a cancer cell line A431 by assessing the respective cellular response caused by each of these two compounds with a

quartz crystal microbalance with dissipation monitoring.

Location: Row - D; Number - 32 Judging Time: 12:30p.m. - 2:00 p.m.

Presenter(s): John Falcone Email: JNF37@drexel.edu
Major: Biology Academic Field: Biological Sciences
Faculty Advisor: Mauricio Reginato, Ph.D. Email: mauricio.reginato@drexelmed.edu

The Role of O-GlcNAc transferase in regulating breast cancer metabolism via modulation of the mTOR/HIF-1 pathway

Author(s): John Falcone, Thomas Lynch

Compared to normal cells, cancer cells consume high levels of glucose and glutamine, leading to an altered metabolic state known as the Warburg effect. The Hexosamine Biosynthetic Pathway (HBP) is one metabolic pathway that relies on availability of glucose and glutamine. Enhanced HBP flux augments post-translational addition of O-linked-b-N-acetylglucosamine (O-GlcNAc) onto proteins. The mammalian target of rapamycin (mTOR) and hypoxia-inducible factor-1 (HIF-1) both contribute to altered metabolism in cancer cells. Here, our results demonstrate that O-GlcNAc transferase (OGT), the enzyme responsible for addition of O-GlcNAc onto proteins, regulates glycolysis in breast cancer and is associated with alterations in mTOR/HIF-1α signaling. Modulation of OGT results in corresponding direct effects in levels of lactate and ATP, indicating altered glycolytic activity. Consistent with these metabolic changes, when total O-GlcNAc is elevated, we observe decreases in phosphorylation of LKB1 and AMP kinase, signifying enhanced intracellular energy status. Decreasing activation of LKB1 and AMP kinase is known to activate mTOR and we, indeed, detect increases in mTOR effectors S6 Kinase and 4EBP. Furthermore, OGT inhibition has no effect on ATP or lactate levels in LKB1-deficient cancer cells, suggesting that OGT regulates cancer metabolism through LKB1-mediated regulation of the mTOR/HIF pathway. Consistent with increased mTOR signaling, elevating O-GlcNAc results in augmented HIF-1α expression. Taken together, our data indicate that HBP, via OGT, connects to other nutrient sensing pathways in breast cancer cells to regulate HIF-1α levels and cancer metabolism. Thus, OGT may represent a novel therapeutic target for inhibiting the mTOR/HIF-1 pathway in breast cancer cells.

Location: Row - D; Number - 39 Judging Time: 11:00a.m. - 12:30p.m.

Presenter(s): Ashley Faller Email: aef47@drexel.edu
Major: Psychology Academic Field: Psychology
Faculty Advisor: Dr. Brian Daily Email: bpd36@drexel.edu

The Incredible Years Program: Evaluation of program effects with at-risk youth

Author(s): Ashley Faller

Research suggests that young children who have social and emotional problems are at higher risk for future negative outcomes such as educational and mental health problems. In addition to these problems, research has identified external factors, such as poorly trained teachers and low socioeconomic status, as prohibiting elements of an enriching learning environment and leaving at-risk youth vulnerable to failure at an early age. By implementing the Incredible Years Teacher Training Series, schools are provided with an evidence-based prevention and intervention program, which not only promotes healthy development of low-income, minority children, but also provides social support and aids in reducing parental stress that results from problematic behaviors. This study will evaluate program effects by running a paired samples t-test that compares baseline measures of parenting practices, child behavior, and child social competence to post test measures of parenting practices, child behavior and child social competence. Due to sample size implications, future research suggestions are discussed.

Location: Row - B; Number - 15 Judging Time: 12:30p.m. - 2:00 p.m.

Presenter(s): Stefanie Farrell Email: saf89@drexel.edu
Major: Biology Academic Field: Biological Sciences
Faculty Advisor: Harold Avery Email: hwa22@drexel.edu

The Importance of Color Contrast to Turtles in Aquatic Environments

Author(s): Stefanie Farrell, Allison Tipton, Abigail Dominy, Harold Avery

Measures of color contrast are important for animals engaged in the detection of targets. The purpose of this study is to determine whether contrasting hues are exhibited at certain wavelengths of the light spectrum in a population of diamondback terrapins (Malaclemys terrapin). Specific anatomical sampling points on each terrapin containing greatest contrast were taken to determine if a pattern existed within and among individuals in the population. Past studies suggest that differences in radiant intensity between different portions of the visual spectrum may increase contrast of a visual target (Lythgoe, 1979). Preliminary data analyses suggest that peak contrasts were generally located in the ultraviolet and orange-red color range across individuals in the population. The existence of peaks in these regions of the light spectrum could directly correspond to the dominance of those wavelengths within the terrapin's aquatic environment. Being able to recognize contrasting hues could influence how terrapins select their mates. Understanding the interplay of the ambient light environment and animal behavior will enable us to properly protect and conserve this species that faces many anthropogenic impacts.

Location: Row - L; Number - 103 Judging Time: 12:30p.m. - 2:00 p.m.

Presenter(s): Dana Formon Email: dlf66@drexel.edu
Major: Psychology Academic Field: Psychology
Faculty Advisor: Tamara Medina Email: tnm38@drexel.edu

Stigma Measurement to Behavioral Vignettes among College Psychology Majors

Author(s): Dana Formon, John Grauman

This study was aimed at detecting correlation between mental illness exposure and levels of stigma in college psychology majors. We predicted a negative correlation between student exposure to mental illness and their degree of stigma. Students completed surveys composed of vignettes portraying individuals with either a mood disorder (depression) or psychotic disorder (schizophrenia). No significant correlation was found in this sample between exposure and stigma ($r = .064$, $p > 0.05$). While the results were not consistent with past research, this study examined the relationship within a new population. The results indicate that experience and stigma are unrelated in this population. This information alone can be further studied to determine the average mental health exposure of psychology students and how that can impact their success in school and higher education experience.

Location: Row - M; Number - 119 Judging Time: 11:00a.m. - 12:30p.m.

Presenter(s): Erika Foster Email: erf44@drexel.edu
Major: Psychology Academic Field: Psychology
Faculty Advisor: Naomi Goldstein Email: neg23@drexel.edu

The Effects of Four Interrogation Strategies on the Likelihood of Delivery of True Confessions in Juvenile Offenders

Author(s): Erika Foster, Lindsey Peterson, Shelby Arnold, Marli Schecker, Naomi E. S. Goldstein

A significant body of research has focused on risk factors for false confessions, but little research has examined risk factors for true confessions, particularly among youthful suspects. Thus, the current study examined whether various types of police interrogation techniques predict juvenile justice-involved youths' susceptibility to providing true confessions. Using a vignette-based format, data from 183 juvenile offenders revealed

differences in youths' self-reported risk of offering a true confession to police during interrogation, with greater risk associated with parental pressure and positive police pressure than with negative police pressure and negative physical environment. Implications and limitations will be described.

Location: Row - M; Number - 112 Judging Time: 12:30p.m. - 2:00 p.m.

Presenter(s): Anna J. Gourlay Email: ajg326@drexel.edu
Major: Biology Academic Field: Environmental Science
Faculty Advisor: Harold Avery Email: haltort@aol.com

The environmental factors controlling diamondback terrapin (Malaclemys terrapin) nesting in Barnegat Bay, NJ

Author(s): Anna J. Gourlay, Julianne M. Winters, Harold W. Avery

Human coastal development directly interferes with available nesting habitats for estuarine wildlife. In Barnegat Bay, NJ, coastal development has depleted the natural shoreline faster than any other Mid-Atlantic estuary in the past thirty years. This upland coastal development significantly reduces diamondback terrapin (Malaclemys terrapin) nesting habitat. With a high rate of coastal habitat loss, it is important to determine what environmental factors predict terrapin nesting so we can better understand how human use affects nesting terrapins. Previous studies suggest spatial patterns of emergence sites, but it remains unknown if a pattern persists in regards to when emergence occurs. Thus, it is important to determine what environmental factors affect the timing of terrapin nesting behavior. We observed the diamondback terrapin nesting and emerging that occurred at a fidelic nesting beach, Conklin Island, from June 1 to July 17, 2011. Records of water salinity and temperature, air temperature, tidal cycle, and wind speed were collected one to three times a day during the survey period. With this environmental data and determining the number and location of emergent females per hour, we will determine how temperature, cloud coverage, wind speed, tidal patterns and salinity control nesting activity. We propose that terrapins will nest more frequently during times of low wind speeds, higher air and water temperatures, high tidal cycles, and low salinity levels. These patterns in temperatures, tidal cycle, salinity, and wind speeds will be used to determine optimal conditions for nesting. With increased anthropogenic disturbances in terrapin habitat, our data will provide the framework for making more informed decisions by wildlife management agencies, which will hopefully lead to more effective protection of terrapin populations in Barnegat Bay and elsewhere.

Location: Row - C; Number - 25 Judging Time: 11:00a.m. - 12:30p.m.

Presenter(s): Nicole Graff
Email: nlg24@drexel.edu
Major: Psychology
Academic Field: Psychology
Faculty Advisor: Maria T. Schultheis
Email: schultheis@drexel.edu

Comparison of driving behaviors on VRDS following traumatic brain injury

Author(s): Nicole Graff, Manning, K., Mitura, R., Klimchuk, D., Neyens, D., Boyle, L., Schultheis, M.

Virtual reality driving simulation (VRDS) allows us to measure new and unique driving performances. VRDS is a way to safely present challenging tasks in the assessment of driving ability following neurological compromise. The current study sought to examine the driving performance between individuals with brain injury (BI) and healthy controls (HC) using VRDS. Specifically, we examined driving when presented with presented with unexpected challenges, such as a boy chasing a ball into the street or a bus releasing a stop sign to allow students to cross the street. All participants were administered the VRDS which consisted of a training session and "virtual drive: through a standardized route. Between-group comparisons of each task using t-test analysis between BI and HC active drivers. In response to the boy chasing the ball, it was noted that the HC stopped an average of 20.8ft closer to the boy or not come to a complete stop at all. In contrast, it was found that during the bus task, the BI group was more likely to stop in the unsafe zone and have an average of 1.5ft deviation within the lane. The current findings demonstrate that individuals with BI and HC differ in their VRDS responses. The finding that drivers with BI stopped at a greater distance from a pedestrian may suggest a more cautious behavior when compared to HC drivers. A discussion of the implications for assessment will be presented.

Location: Row - F; Number - 53
Judging Time: 12:30p.m. - 2:00 p.m.

Presenter(s): Johnathan Guest
Email: jdg77@drexel.edu
Major: Still-Deciding Science
Academic Field: Biological Sciences
Faculty Advisor: Dr. Harold Avery
Email: haltort@aol.com

Effects of claw length and proportion to body size on interspecific and intraspecific competition for limited resources in Trachemys scripta elegans and Pseudemys rubriventris

Author(s): Johnathan Guest, Steven Pearson, Harold Avery

Competition between species can result in extirpation of the weaker competitor. Invasive generalist species may be ecologically similar to some native species and competition between these species can be detrimental to native species populations. A physical mechanism in aquatic reptiles that may give an individual or species a competitive edge could be claw size relative to body size. In this study we examined how the ratio of plastron

length to claw length (PL:CL) of an invasive turtle species, *Trachemys scripta elegans*, and a native species, *Pseudemys rubriventris,* impacted the ability to utilize limited feeding and basking resources. If *T.s. elegans* has a lower PL:CL ratio while feeding and basking more frequently than *P. rubriventris*, then claw length-body proportions might play a role in the ability of *T. s elegans* to outcompete*P. rubriventris* for limited resources. Six *T.s. elegans* and six *P. rubriventris* were housed in 6' diameter mesocosms, each with a stationary, steep-edged platform used for basking and feeding. The experiment was run in triplicate simultaneously and monitored using digital recording devices. The middle claw length on the right forefoot of each turtle was measured to the nearest 0.1 mm using digital calipers. The PL:CL ratio for *T.s. elegans* was lower than for *P. rubriventris* while the feeding and basking success of *T. s. elegans* was greater. These results suggest that *T.s. elegans* can affect the competitive success of native species if they have a distinct physical advantage such as a lower PL:CL ratio.

Location: Row - D; Number - 30 Judging Time: 12:30p.m. - 2:00 p.m.

Presenter(s): LeeAnn Haaf Email: lh334@drexel.edu
Major: Environmental Science Academic Field: Biological Sciences,
Faculty Advisor: Walter Bien Environmental Science
Email: wbien205@comcast.net

Microenvironment Usage of Pituophis melanoleucus in the NJ Pine Barrens

Author(s): LeeAnn Haaf, Ronald Smith

Poikilotherms are dependent on available environmental characteristics for maintaining body temperatures and exploit specific microhabitats or microclimates to achieve this. We investigated the microenvironment usage of the northern pine snake (Pituophis melanoleucus), a New Jersey state-threatened species commonly found in pine-oak uplands. We collected data on microclimatic variables, such as air temperature, air humidity, soil surface temperature, soil temperature, and surface humidity, and microhabitat characteristics, such as leaf litter cover, canopy cover, percentage of logs, and illuminance, for 9 pine snake's radio telemetry relocations at Warren Grove Gunnery Range, in the pine barrens of New Jersey from 2005 and 2006. A MANOVA was run on microclimatic and microhabitat data in order to test if site usage differed between males, females, and gravid females ($p<0.001$) and if these parameters could predict the behavior ($p<0.01$) or exposure of the snake ($p<0.001$). Then, multiple discriminate analyses were performed to test which of the collected microenvironmental variables had the largest impacts on predictive power in each model. For the threatened pine snake, identifying which of these characteristics are important for daily body temperature maintenance is crucial for understanding the potential impacts of macrohabitat disturbance when evaluating land for conservation management.

Location: Row - H; Number - 71 Judging Time: 11:00a.m. - 12:30p.m.

Presenter(s): Connor Hackert Email: Connor.Hackert@gmail.com
Major: History and Politics/BS-JD Academic Field: History, Political Science
Faculty Advisor: Scott Knowles Email: sgk23@drexel.edu

Examining Equality: Analyzing the Gray Area in Reconstruction-Era Civil Rights Litigation: The Impact of U.S. v. Newcomer on the National and Pennsylvania Civil Rights Movement

Author(s): Connor Hackert

During Reconstruction, the Civil Rights Movements erupted throughout the U.S. as African Americans and their supporters began to push for equality. The 14th Amendment and the Civil Rights Act of 1875 became avenues through which blacks began to implement civil equality by bringing forth lawsuits against acts of discrimination. A great deal of uncertainty lingered as the outcomes of such cases varied from state to state along "the color line."

In Pennsylvania, the first legal case to challenge segregated facilities following the passing of the 14th Amendment was U.S. v. Upton Newcomer. In analyzing the case and tracing its involvement in subsequent legal battles its implications on the national and local Civil Rights Movements become apparent. The case demonstrates that the strengths of the movements during Reconstruction came through individual and localized efforts. This was because, after the handing down of the Civil Rights Cases, it became a matter of the state to enact and enforce civil rights legislation. For states like New York or South Carolina this was a simple, but for Pennsylvania, the story is much less black and white.

The case of Newcomer gave African Americans a firm foundation to build off of, but still many resisted. Newcomer served as a catalyst in the local movement between 1876 and 1883. After 1883 when the 1875 act was repealed and the infamous case of Plessy v. Ferguson was handed down, the spirit of the Newcomer decision shifted focus. African Americans kept fighting back against inequality, but not in the courtrooms. As such, a new era of “civil rights” was ushered in and continued through the turn of the century.

Location: Row - N; Number - 129 Judging Time: 12:30p.m. - 2:00 p.m.

Presenter(s): Michael Hoffman Email: mjh98@drexel.edu
Major: Psychology Academic Field: Psychology
Faculty Advisor: Dr. Brian Daly Email: bpd36@drexel.edu

Examining Sensory Processing Deficits in children with and without ADHD Daly, B. Ph.D Drexel University & Hoffman, M.J. BS Drexel University

Author(s): Michael Hoffman, Dr. Brian Daly, PhD

Background: Recent studies suggest associations between symptoms of Attention Hyperactivity/Impulsivity Disorder (ADHD) and sensory processing problems (Yochman et al., 2004). However, few experiments have examined these problems by comparing ADHD children to a control group. As such, we investigated whether ADHD children have more sensory processing problems compared to typical peers. We hypothesized that ADHD participants have more sensory problems compared to a control group.
Methods: Participants were 45 children (24 males and 11 females) between ages 5 to 10 years. The ADHD group had 26 children while the control group had 19 children. The Sensory Processing Measure Home Form (Parham & Ecker, 2007) and the Short Sensory Profile (Dunn, 1999) assessed sensory problems. The Conners 3-Parent form (Conners, 2008) measured ADHD symptom severity.
Results: Analyses revealed no significant differences ($p>.05$) between groups on ethnicity, gender, and age. Independent t-tests yielded a significant difference ($p<.05$) when comparing SPM and SSP total score between groups. Higher SPM scores signify greater sensory processing symptoms. Lower SSP scores indicate more sensory problems. SPM total score ($M=61.60$; $SD=7.879$) for the ADHD group was significantly greater than the control group ($M=48.00$; $SD=8.654$). SSP total score for the ADHD group ($M= 134.19$; $SD=21.882$) was significantly less than the control group ($M= 180.16$; $SD= 14.06$).
Discussion: Results extend the findings of recent research that children with ADHD are at-risk for sensory problems. As such, early detection of sensory problems in youth with ADHD can translate into early intervention and prevent significant problems in social and academic functioning.

Location: Row - A; Number - 2 Judging Time: 12:30p.m. - 2:00 p.m.

Presenter(s): Kristian Ingraham Email: kti25@drexel.edu
Major: Biological Sciences Academic Field: Environmental Science
Faculty Advisor: Harold Avery Email: haltort@aol.com

Diets and Growth Rates of Pseudemys rubriventris and Trachemys scripta elegans in South-Eastern Pennsylvania.

Author(s): Kristian Ingraham, Sabrina R. Douglas, Steven H. Pearson, Harold W. Avery

Diets of animals are affected by the dietary resources available within their habitat. Anthropogenic disturbances can lead to decreases in food availability. We studied the diets and growth rates of the native red-bellied turtle (Pseudemys rubriventris) and the introduced red-eared slider turtle (Trachemys scripta elegans) in southeastern

Pennsylvania at the Silver Lake Nature Center, an interconnected large wetland complex, and at Fort Mifflin, a small and fragmented wetland complex. These wetlands differ in species richness and food availability. Dietary components from fecal samples were identified to their lowest possible taxon. Growth rates of turtles were determined using annuli on the shell. Dietary items were measured by volume to determine the relative abundance in the diet. Both species are omnivores with plant material composing greater than 88% of their diet. At Silver Lake Nature Center, the diet of red-bellied turtles differed from that of red-eared slider turtles. Both species fed on different plants and animals. Animal material composed 12% of red-eared slider turtle diets versus 1% in red-bellied turtles. At Fort Mifflin, both species had similar diets consisting of approximately 95% plant material. At Silver Lake Nature Center, both species grew faster than those at Fort Mifflin. These results suggest that smaller wetland size and habit fragmentation may lead to population declines due to inhibited growth rates and narrowing dietary niche breadth.

Location: Row - G; Number - 59 Judging Time: 12:30p.m. - 2:00 p.m.

Presenter(s): Stephanie Kasprzak Email: skasprzak90@gmail.com
Major: Environmental Engineering Academic Field: Environmental Science
Faculty Advisor: Gail Hearn Email: gwh26@drexel.edu

The Impact of Farming on Avian Abundance and Diversity at the Moka Wildlife Center, Bioko Island, Equatorial Guinea

Author(s): Stephanie Kasprzak, Jacob Owens, Gail Hearn

To evaluate the impact of the habitat disturbance caused by increasing farming on Bioko Island, Equatorial Guinea, mist nets were used to capture birds in both natural and disturbed habitats in the lands surrounding the Moka Wildlife Center. Nets were deployed for 80.5 net hours, and a total of 52 birds were caught, representing 25 species. We found that currently used agricultural areas had the highest abundance of the species present, at 35 birds with 17 different species and an average rate of capture of 0.16 birds per hour. The species with the highest abundances caught in this habitat were the Brown Chested Alethe (Alethe poliocephala), the Common Waxbill (Estrilda astrild) and the Double Collard Sunbird (Cinnyris chalybeus). Reclaimed forest had the highest biodiversity of species with a total of 17 birds and 13 species caught at an average rate of 0.45 birds per net hour. The species with the highest abundances caught in this habitat were the African Hill Babbler (Pseudoalcippe abyssianica) and the Evergreen Forest Warbler (Bradypterus lopezi). This study provides evidence that the destruction of natural forest habitats for agricultural purposes may impact the bird populations living on Bioko Island, Equatorial Guinea.

Location: Row - L; Number - 104 Judging Time: 11:00a.m. - 12:30p.m.

Presenter(s): Julie Keppler Email: juliekeppler@gmail.com
Major: Biological Sciences Academic Field: Biological Sciences
Faculty Advisor: Dr. Jacob Russell Email: jar337@drexel.edu

Comparison of adult and larval bacterial gut community compositions in Cephalotes varians

Author(s): Julie Keppler

Ants are among the most ecologically dominant organisms in terrestrial ecosystems. Their success is partially credited to a variety of dietary specializations, including carnivory, omnivory, and herbivory. However, herbivory is a plant-based diet that does not contain all nutrients necessary for ant growth and reproduction. One hypothesis of how herbivorous ants can support themselves on these incomplete diets is through association with bacterial gut symbionts, which provide nutrient supplementation. For Cephalotes varians, an herbivorous ant, past 454 pyrosequencing results revealed striking differences between gut communities of adults and larvae from a single colony. To address why these are different, five C. varians larvae from two different colonies were collected. Characterization of their gut microbes was achieved through cloning and Sanger sequencing of the bacterial 16S rRNA gene. Based on RDP classification of 130 sequences from these five larvae, we detected four major taxonomic groups of bacteria: Enterobacteriales, Lactobacillales, Rhizobiales, and Clostridiales. Phylogenetic analyses suggest that C. varians larvae harbor gut microbes related to endosymbiotic bacteria of the rice brown planthopper and gut bacteria found in adult ants of several species, including C. varians. The results indicate that there may be different modes of acquisition of gut bacteria at different developmental stages. It also suggests that the bacteria have different roles in metabolic processes. This might relate to differences in adult and larval diets.

Location: Row - M; Number - 120 Judging Time: 12:30p.m. - 2:00 p.m.

Presenter(s): Sravanthi Koduri Email: sk933@drexel.edu
Major: Biological Sciences Academic Field: Biological Sciences
Faculty Advisor: Felice Elefant Email: fe22@drexel.edu

An Epigenetic Role for Tip60 in Learning and Memory

Author(s): Sravanthi Koduri, Kellie Chiu

Age-associated cognitive decline and neurodegenerative disorders such as Alzheimer's disease (AD) are an increasing biomedical concern as age expectancy increases. Such memory deficits are associated with gene misregulation; however the mechanisms underlying decline of gene control are unknown. Recent studies bolster the concept that

aberrant changes to the epigenetic modification code within the genome of the brain as we age, specifically histone acetylation, cause gene misregulation that drives cognitive decline. Given the strong link between aberrant acetylation marks and cognitive decline, it is critical to study the histone acetyl transferase (HAT) enzymes that create such marks. One promising candidate is Tip60, a HAT implicated in AD and shown by our laboratory to be critical in regulating neuronal processes linked to cognition. To explore a direct role for Tip60 in memory formation, here we assess the consequences of misregulating Tip60 HAT activity in the Drosophila mushroom body (MB), a hippocampus like region of the fly brain associated with learning and memory. We are generating transgenic fly lines producing either additional Tip60 or a Tip60 mutant protein that lacks HAT activity linked to a GFP MB marker. Morphological effects on the MB due to Tip60 misregulation will be assessed using GFP staining and confocal imaging. We also use the well-established Drosophila courtship assay to functionally assess learning and memory. Importantly, our preliminary data shows a reduction of memory processing in response to Tip60 HAT loss. These studies should provide new biological insight into epigenetic gene control mechanisms underlying cognitive decline during aging.

Location: Row - C; Number - 24 Judging Time: 12:30p.m. - 2:00 p.m.

Presenter(s): Mark Kondrla Jr Email: mpk44@drexel.edu
Major: Mathematics Academic Field: Mathematics
Faculty Advisor: David Ambrose Email: ambrose@math.drexel.edu

Computing Time-Periodic Solutions of a Simple Model for the Vortex Sheet with Surface Tension

Author(s): Mark Kondrla Jr, Michael Valle

We compute time-periodic solutions of a simple model for the vortex sheet with surface tension. A vortex sheet is the interface between two fluids, across which there is a jump in the tangential components of the fluids' velocities.

The existence of time-periodic solutions, or standing waves, for vortex sheets with surface tension is an open question. There has been, however, a computational study of the existence of such waves [Ambrose, D.M.; Wilkening, J.; Proc. Natl. Acad. Sci. USA 107 (2010), 3361-3366]. Before attempting to prove such waves exist for the full equations of motion, it seems prudent to first attempt a proof using the simple model. However, it is helpful to first perform computations to gather evidence of the existence of standing waves for the model system.

The steps of the numerical method include first defining a functional which measures whether a solution of the initial value problem is time-periodic, for a given period. Then,

the variational derivative of the functional with respect to the initial data and the presumed period is computed. We minimize this functional numerically, using the BFGS gradient descent algorithm.

The computational study of the full system found a continuum of symmetric solutions bifurcating from the zero equilibrium. We find the same for the simplified model. This helps to validate the model, and also provides evidence to support future analytical research directions.

Location: Row - J; Number - 84 Judging Time: 12:30p.m. - 2:00 p.m.

Presenter(s): Diana Kuritza Email: diana.kuritza@gmail.com
Major: Biology Academic Field: Biological Sciences
Faculty Advisor: Felice Elefant Email: fe22@drexel.edu

Effect of Tubacin and Suberoylanilide Hydroxamic Acid (SAHA) on the acetylation of tubulin and synaptic plasticity in a Drosophila Tip60 HAT mutant model.

Author(s): Diana Kuritza, Sarah Pullar, Jessica Sarthi, Felice Elefant

Epigenetic marks are post-translational histone modifications that affect gene expression by altering the packaging of chromatin in the nucleus of eukaryotic cells. One such modification is acetylation, which is covalently linked to histone proteins by a family of enzymes called histone acetyl transferases (HATs). Studies from our laboratory show that the HAT Tip60 plays an important role in synaptic plasticity. Our microarray data shows that Tip60 is associated with the regulation of genes enriched for specific neuronal process involved in learning and memory. We also show that pre-synpatic loss of Tip60 HAT function in Tip60E431Q and the APP/Tip60E431Q causes a significant increase in synaptic bouton numbers at the Drosophila neuromuscular junction (NMJ), a well-characterized model used to study synaptic plasticity. Intriguingly, this increase in synaptic bouton formation is accompanied by a decrease in the acetylation of tubulin, a modification involved in the organization of the cytoskeleton that is linked to bouton formation . Here, we will investigate whether Tip60 associated tubulin acetylation plays a direct role in controlling synaptic bouton formation. We hypothesize that restoration of tubulin acetylation in our Tip60 HAT mutant flies will at least partially rescue the defects in synaptic plasticity and locomotor activity caused by loss of Tip60 HAT function. To test this hypothesis, we are treating Tip60 HAT mutant flies with Tubacin, a histone deacetylase (HDAC) inhibitor that specifically inhibits HDAC6 from deacetylating tubulin, and SAHA, another HDAC inhibitor shown to increase tubulin acetylation levels to pharmacologically enhance tubulin acetylation in these flies. We will then assess whether this treatment will at least partially rescue the decreased locomotion and increased synaptic bouton formation we observe in Tip60E431Q and APP/Tip60E431Q mutants. These studies should have implications for the use of tubulin modification based therapeutics for potential treatment

of neurodegenerative disorders associated with synaptic plasticity defects.

Location: Row - E; Number - 40 Judging Time: 12:30p.m. - 2:00 p.m.

Presenter(s): Tim Lehman Email: tal44@drexel.edu
Major: History Academic Field: History
Faculty Advisor: Kathryn Steen Email: steen@drexel.edu

Philadelphia's Railroad Economy and the Rise of the Pennsylvania Railroad Following the American Civil War

Author(s): Tim Lehman

Following the American Civil War, the city of Philadelphia experienced a period of great economic prosperity. This primary reason for Philadelphia's economic success was the expansion and use of its railroads for military transportation purposes during the war. The focus of my research is primarily based on three of the large railroad companies and their functions during the latter half of the 1800s: The Philadelphia-Reading Railroad, the Philadelphia, Wilmington and Baltimore Railroad, and most importantly, the Pennsylvania Railroad Company. Philadelphia's wartime hospitals and arsenals made the city very ideal for the US War Department to use its railroad companies. Because of this, these companies greatly benefitted – none more than the Pennsylvania Railroad Company. In fact, by war's end in 1865, the Pennsylvania Railroad Company was one of the largest corporations in the world. My research is mostly investigative as I look to show to economic development of the Pennsylvania Railroad Company during and after the Civil War. This research was part of a senior thesis project and a larger project that involved developing a video game set in Philadelphia during the Civil War.

Location: Row - N; Number - 128 Judging Time: 11:00a.m. - 12:30p.m.

Presenter(s): Lauren Mace Email: laurenmace@gmail.com
Major: Psychology Academic Field: Psychology
Faculty Advisor: Dr. Maria Schultheis Email: schultheis@drexel.edu

Measuring simulation sickness during virtual reality driving in neurological populations

Author(s): Lauren Mace, Elizabeth K. Whipple, Laura Brennan, Kevin J. Manning, Jocelyn G. Ang,, Maria T. Schultheis, Ph.D

Objective: The use of virtual reality (VR) simulation for assessment and rehabilitation in neurological/patient populations continues to grow. A significant side effect of VR is

simulator sickness (SS). The most commonly used tool to assess for SS is the Simulator Sickness Questionnaire (SSQ), originally developed for healthy military personnel. Although used with clinical population, questions remain about the interpretation of SSQ scores for individuals with neurological compromise [i.e., brain injury (BI), multiple sclerosis (MS)]. The current study compared the SSQ measures between individuals with ABI, MS, and healthy controls (HC) during exposure to a virtual reality driving simulator (VRDS).

Participants and Methods: Individuals with BI (n = 27), MS (n = 33) and HC (n = 46) were administered the SSQ in conjunction with VRDS exposure. The SSQ consists of a symptom checklist administered at both pre and post VR exposure. For each participant, a post-exposure SSQ score were calculated using Kennedy's documented procedures. In addition, a pre-exposure SSQ score was calculated to quantify the presence of symptoms prior to exposure.

Results: Between group comparisons using ANOVA indicated that individuals with MS (M = 17.57, SD = 23.08) and ABI (M = 18.42, SD = 23.97) reported a significantly higher level of symptom presentation prior to the VR exposure than HCs (M = 8.37, SD = 11.91), [F (2, 103) = 3.22, p = .044, p < .05]. Similarly, the neurological populations endorsed a higher level of symptoms post-VR exposure: MS (M = 33.89, SD = 28.68), ABI (M = 35.18, SD = 34.28) than HCs (M = 21.22, SD = 27.71), but this difference was relative to the pre-exposure score and did not reach significance.

Conclusion: The findings suggest that individuals with neurological compromise (i.e, BI, MS) may present with SS related symptoms prior to VR exposure; however, the presence of these symptoms does not appear to increase susceptibility to SS. Further research examining the utility of the SSQ with populations experiencing cognitive, physical and behavioral impairments can further delineate the contribution of these factors to SS symptoms.

Location: Row - N; Number - 122 Judging Time: 11:00a.m. - 12:30p.m.

Presenter(s): Rumaan Malhotra Email: rm587@drexel.edu
Major: Biology Academic Field: Environmental Science
Faculty Advisor: Gail Hearn Email: gwh26@drexel.edu

New distributional records and undescribed species of beetles (Coleoptera) from the island of Bioko, Equatorial Guinea, Central/West Africa

Author(s): Rumaan Malhotra, Prospero Rivas, Jacob Owens, Daniel P. Duran, Gail W. Hearn

As a preliminary assessment of the distribution of beetles (Coleoptera) on the tropical (4o N latitude), volcanic, land-bridge island of Bioko (Equatorial Guinea) in Central Africa's Gulf

of Guinea, two distinct elevations (sea level and 1400 masl) were sampled by three different standard techniques (light trapping, flight intercept trapping, or walking transects with an aerial net) for 2 consecutive 12 day periods. The first period (Jan 10 to 22, 2012) conducted at sea level, concentrated on tiger beetles (Coleoptera:Carabidae:Cicindelinae) and resulted in detection of five species Hipparidium macrochilum, Hi. interruptum, Habrodera nitidula rutherfordi, Cylindera n. sp1, Cylindera n. sp2, four of which are new records for both the island of Bioko and for the country of Equatorial Guinea; two species appear to be new to science. The second period (Feb 11 to 23, 2012) conducted at 1400 m above sea level at the Moka Wildlife Center, surveyed all beetle species. The three most common identifiable families caught were Staphylinidae, Cerambycidae, and Scarabidae, but no tiger beetles were captured at this higher elevation.

Location: Row - J; Number - 87 Judging Time: 12:30p.m. - 2:00 p.m.

Presenter(s): Tyler Maruca Email: tmm359@drexel.edu
Major: Biology Academic Field: Biological Sciences
Faculty Advisor: Jacob Russell Email: jar337@drexel.edu

Amplification of the 16s rRNA intergenic spacer region for rapid detection of pea aphid, Acrythosipon pisum, bacterial endosymbionts

Author(s): Tyler Maruca

Pea Aphids, Acyrthosiphon pisum, have been shown to harbor seven different facultative bacterial endosymbionts. These secondary symbionts play many roles ranging from defense against parasitic wasps and fungal pathogens, thermotolerance, and host plant utilization. The current method for the detection of these symbionts requires a separate diagnostic Polymerase Chain Reaction (PCR) to be run for each symbiont. Roughly 2000 pea aphids were collected from clover and alfalfa fields in Pennsylvania and New York in 2012 and need to be screened for all pea aphid secondary symbionts, a costly and time-consuming task. The objective of this study was to create a cost-effective PCR that would enable the accurate detection of multiple secondary endosymbionts that requires less time and fewer resources. The primary method was to utilize PCR to amplify the intergenic spacer region between the 16S and 23S rRNA, a segment of variable length, genes using universal forward and reverse primers. The primers used were 1513F and 35R. These primers amplify the DNA of most of the desired secondary endosymbionts, thus allowing for the positive detection of up to five symbionts using a single PCR reaction and a single run of gel electrophoresis. Both the 1513F-35R and the seven diagnostic primer sets required optimization by varying reaction temperatures, gel-loading volumes, gel running time, and method used for staining gels. After optimization was finished the use of this method has proven to be both efficient and accurate, and appears to be a promising technique for detection of multiple bacterial endosymbionts in pea aphids.

Location: Row - A; Number - 1 Judging Time: 11:00a.m. - 12:30p.m.

Presenter(s): Peter Massey Email: phm24@drexel.edu
Major: Department of Physics Academic Field: Physics
Faculty Advisor: Brigita Urbanc Email: brigita@physics.drexel.edu

F4G: Identifying Structural Elements Involved in Mediating Amyloid β-protein Toxicity in Alzheimer's Disease

Author(s): Peter Massey, Bogdan Barz

Alzheimers disease (AD) is the prevalent form of a dementia, affecting over 5 million people in the U.S. alone. It is a major cause of disability and mortality, and its impact on health care expenses, including direct and indirect medical and social service costs, is estimated to be greater than $100 billion per year. Substantial evidence implicates low molecular weight amyloid β-protein (Aβ) assemblies, and oligomers, in the AD pathology. Two predominant forms of Aβ are 40 and 42 amino acids long, Aβ1−40 and Aβ1−42. Of the two, Aβ1−42 is more strongly associated with AD and forms more toxic oligomers. Experimentally, the structural differences between Aβ1−40 and Aβ1−42 oligomers are difficult to quantify due to their transient and non-homogeneous nature. Recent studies using an efficient discrete molecular dynamics (DMD) approach have suggested that a higher solvent exposure of the N-terminal region D1-R5 in Aβ1−42 oligomers, relative to Aβ1−40, is associated with its increased toxicity. Here, we identified a hydrophobic amino acid in this region (F4) that could potentially mediate an interaction of Aβ1−42 oligomers with a membrane. We used the DMD approach to study oligomer formation of the F4G mutants, [F4G] Aβ1−40 and [F4G] Aβ1−42 , and characterized the resulting structures. We calculated the oligomer size distributions of the two mutant peptides that showed increased occurrences of pentamers and hexamers relative to the corresponding wild-type peptides. No oligomers of orders 10 or in the range of 12 to 14 (characteristic of Aβ1−42) were observed in the mutant peptides. Instead, [F4G] Aβ1−42 formed an elongated protofibril (with an oligomer order of 17). Intriguingly, our structural analysis demonstrates that the N-terminal region D1-R5 of the resulting mutant oligomers structurally resembles more Aβ1−40 than Aβ1−42. Based on these data, we hypothesize that [F4G] Aβ1−42 will exhibit reduced toxicity, as compared to Aβ1−42. If this hypothesis is correct, then designing small molecules that bind and block the residue F4 of Aβ1−42 oligomers might represent an efficient therapeutic strategy.

Location: Row - C; Number - 28 Judging Time: 12:30p.m. - 2:00 p.m.

Presenter(s): Matthew McBride Email: mjm497@drexel.edu
Major: Chemistry Academic Field: Chemistry
Faculty Advisor: Jean-Claude Bradley Email: jeanclaude.bradley@gmail.com

Using Open Notebook Science to predict the solubility of trans-cinnamic acid using the Abraham Model

Author(s): Matthew McBride, Jean-Claude Bradley, Andrew Lang, William Acree

This research investigates the ability of the Abraham Model to accurately predict the solubility of trans-cinnamic acid in organic solvents. Specifically, the solubility of cinnamic acid in methanol, benzene, toluene, chloroform and acetonitrile have been measured through the use of the density method. In addition to this, the solubility of cinnamic acid in cyclohexanone and 1,2-dichloroethane have been measured using 500MHz HNMR. The Abraham Model is useful because it uses experimentally measured solubilities to predict solubility in unmeasured solvents. This information would be useful for determining the best solvent to use when attempting to recrystallize cinnamic acid and more generally, provides valuable information for choosing a solvent for an organic reaction. In a similar manner, there is a model that allows melting points to be predicted that would be extremely useful for checking reported melting points contained in scientific papers before the papers are released for publication. This research was conducted used Open Notebook Science, which releases all experiments completed and results online to promote the sharing of information. A case will be made that open and real-time sharing of experimental results, whether successful or not, leads to more efficient and rapid scientific progress.

Location: Row - I; Number - 81 Judging Time: 12:30p.m. - 2:00 p.m.

Presenter(s): Daniel McGovern Email: dpm46@drexel.edu
Major: Physics Academic Field: Physics
Faculty Advisor: Dr. Luis Cruz Email: lrc42@drexel.edu

Neuron Density Map Analysis to Quantify Aging Effects

Author(s): Daniel McGovern

In order to better understand the effects of neuron displacement and its role in the aging process, a new study has been proposed to observe the brain of the fruit fly. This is an attractive project because the brain can be divided into much more continuous slices considering the size. Also, the fruit flies themselves present a much more controlled specimen that can be made to exhibit desired aging effects. The project will be to review neuron density maps, optimize the automated mapping process, and assist in research regarding neuron displacement. A custom designed protocol written for the existing

program called PN (plaque-neuron) will be used to filter brain scan images and automatically find neurons.

Location: Row - L; Number - 109 Judging Time: 12:30p.m. - 2:00 p.m.

Presenter(s): Sajjan Mehta Email: ssm53@drexel.edu
Major: Physics Academic Field: Physics
Faculty Advisor: David Goldberg Email: dmg39@drexel.edu

The Growth and Diffusion Entropy during Inflationary Expansion

Author(s): Sajjan Mehta, David M. Goldberg

The second law of thermodynamics is commonly used as an effective arrow of time. However, most analyses of cosmological entropy growth assume the possibility of black hole formation, which likely depends strongly on cosmological parameters. We investigate the evolution of entropy during the early period of structure formation by exploring the diffusion of entropy during the early inflationary expansion as well as in perturbed, gravitating systems.

Location: Row - E; Number - 42 Judging Time: 12:30p.m. - 2:00 p.m.

Presenter(s): Sarah Michelson Email: sjm72@drexel.edu
Major: Biological Sciences Academic Field: Biological Sciences
Faculty Advisor: Dr. Daniel Marenda Email: dm562@drexel.edu

Development and Validation of an Aged Alzheimer's Disease Model in Drosophila melanogaster

Author(s): Sarah Michelson, Siddhita Mhatre

Late-onset Alzheimer's disease (LOAD) is a highly prevalent and irreversible neurodegenerative disorder that involves the accumulation of β-amyloid (Aβ) plaques and neurofibrillary tangles in the brains of elderly patients. Sequential cleavage of amyloid precursor protein (APP) by β-site APP cleaving enzyme (BACE) and γ-secretase produces Aβ40 and Aβ42 peptides, the latter of which is toxic and forms aggregates. In an attempt to analyze this debilitating disorder, we are developing a novel Aged AD model using Drosophila melanogaster. Through the Gal4-UAS system, we are able to express low levels of human APP and BACE specifically in the fly's nervous system. Benefits of our model include the development of behavioral and neuropathological symptoms later in the fly's lifespan due to gradual accumulation of Aβ within the central nervous system. Our model

provides us with a comparable timeline for the disease pathology of LOAD in humans, and it will be an excellent tool for the rapid testing of small molecules for therapeutic intervention in vivo.

Location: Row - L; Number - 108 Judging Time: 11:00a.m. - 12:30p.m.

Presenter(s): Dori Molozanov Email: dpm54@drexel.edu
Major: Communications Academic Field: Communication, English
Faculty Advisor: Kathleen Volk Miller Email: krv23@drexel.edu

Social Media Promotion for Literary Non-profit Organizations

Author(s): Dori Molozanov

After working at a literary magazine for an entire summer, I learned the importance of social media as a promotional tool. Small non-profit organizations in particular stand to benefit significantly from this tool. Although my research is focused primarily on the literary non-profit world, any organization, regardless of size or function, can benefit from incorporating social media into its regular promotional activities. Understanding how to use platforms Twitter, Facebook, YouTube, blogs, and LinkedIn can greatly increase an organizations' influence. Most organizations are aware of this powerful and cost-effective marketing technique, but many are unsure of how to use it effectively. In addition to managing Twitter and Facebook accounts for Painted Bride Quarterly, a literary magazine operating out of Drexel University, I met other players in the field and learned about techniques that other similar organizations use to increase their social reach. My presentation will be an instructive and informative analysis of how organizations can best use social marketing as a promotional tool to get the word out about what they do.

Location: Row - D; Number - 35 Judging Time: 12:30p.m. - 2:00 p.m.

Presenter(s): Carolyn Moy Email: cem327@drexel.edu
Major: Biology Academic Field: Biological Sciences, Environmental Science, Environmental Studies
Faculty Advisor: Drew Cronin Email: cronin.drew@gmail.com

Diversity and Bill Polymorphism of Sunbirds (Nectariniidae) at Moka, Bioko Island, Equatorial Guinea

Author(s): Carolyn Moy, Drew Cronin, Gail Hearn

While many studies have sought to identify and examine the terrestrial species of Bioko Island, very little attention has been paid to the ecology of its avifauna. A baseline study began in November 2011, which sought to describe the relative abundance of birds around the Moka Wildlife Center (Bioko Biodiversity Protection Center/Drexel University) in the Moka highlands on Bioko. Further investigated was bill polymorphism in the well-represented sunbird family, Nectariniidae. Mist nets were set up at various sites in a farm-brush matrix around the research station at an elevation or approximately 1400 m. Nets were open from 0600 h to 1230 h and 1400 h to 1800 h, and were checked every 15 minutes. All captured individuals were processed following Smith's (1987) protocol and banded for future identification using individualized aluminum bands. Overall, 18 species of birds were caught, of which greenbul species (Pycnonotidae) were the most abundant. However, although fewer Nectariniidae individuals were captured, its species diversity was highest. Within captured Nectariniidae individuals, interspecific variation was found to exist in upper and lower mandible length, but not within upper and lower mandible width or overall bill depth. This pilot study serves as a baseline for ongoing research about the avian abundance, diversity, and species composition at the Moka Wildlife Center and other sites on Bioko Island.

Location: Row - A; Number - 5 Judging Time: 11:00a.m. - 12:30p.m.

Presenter(s): Kenneth Mui Email: kkm35@drexel.edu
Major: Physics Academic Field: Physics
Faculty Advisor: Pavel Grinfeld Email: pg77@drexel.edu

Utilizing Maple to Solve Physics Problems in Classical Mechanics

Author(s): Kenneth Mui

The objective of the senior thesis project is to develop a tool kit or package that implements the logic and structure of classical mechanics in a symbolic environment. The package will calculate the Euler-Lagrange Equations from the Lagrangian of a system and solve the resulting differential equations numerically. The environment used will be Maple. This package will allow one to solve a full range of problems in classical mechanics; one such example is the precession of Earth's orbit.

Location: Row - N; Number - 123 Judging Time: 12:30p.m. - 2:00 p.m.

Presenter(s): Violeta Nasto Email: vn47@drexel.edu
Major: Chemistry Academic Field: Chemistry
Faculty Advisor: Karl Sohlberg Email: Karl.William.Sohlberg@drexel.edu

Theoretical investigations of a possible new class of materials: a Superatom Ionic Solid

Author(s): Violeta Nasto, Karl Sohlberg

A new material is proposed that is based on periodic arrangement of superatom ions. The solid is constructed with ions formed from cationic (Ce@C60+) and anionic (Al@Cu54-) "superatom" spherical species that have shown exceptional stability, instead of the typical atomic or polyatomic ions of a conventional ionic solid. According to radius-ration rules, the solid will form a CsCl (8:8 coordination) crystal structure with body-centered (bcc) type of unit cell. A single unit cell with periodic boundary conditions is modeled and properties of the material are calculated using MOPAC, a semi-empirical quantum chemistry program. By calculating the cohesive energy curve, the material density and stability of the proposed new material are revealed. Furthermore, an estimate of the band gap of the system will show whether the material is an insulator or a semiconductor and how it can be tested further.

Location: Row - G; Number - 65 Judging Time: 12:30p.m. - 2:00 p.m.

Presenter(s): Kristina Nikolova Email: k.nikolova10@gmail.com
Major: Biological Sciences Academic Field: Biological Sciences
Faculty Advisor: Dr. Jahan Ara Email: Jahan.Ara@drexelmed.edu

Hypoxic-preconditioning Increases Proliferation in the Subventricular Zone of Newborn Piglets

Author(s): Kristina Nikolova, Valerie Sapp, Melissa Frank, Jahan Ara

Neonatal hypoxic-ischemic brain injury is a common cause of long-term neurological disability in children. Despite advances in supportive care, no treatments for hypoxic-ischemic brain injury are available at present. Neural stem /progenitor cells (NSPs) provide the greater potential to regenerate neurons required to reconstitute the brain function. One of the strategies to activate endogenous repair systems is neuronal hypoxic-preconditioning (PC), which represents an adaptive response to prime the brain for protection against future injury. To determine whether hypoxic-preconditioning of neonatal brain increases the proliferation of NSPs in the subventricular zone (SVZ) of newborn piglets, one-day-old piglets were divided into normoxic and hypoxic-preconditioning groups. Normoxic piglets were subjected to 21% O2 for three hours and PC piglets were subjected to 8% O2 /92% N2 for three hours. NSP proliferation was estimated by pulsing single 5-Bromo-2-deoxyuridine (BrdU) injections (50 mg/kg body weight) interperitoneally at one, three, or seven days recovery, two hours prior to sacrifice. Tissue sections were stained for BrdU. Injections with BrdU after PC revealed a robust proliferative response within the SVZ. BrdU immunostaining was also evident in the striatum and white matter of PC piglets. The number of BrdU labeled cells in SVZ, striatum,

and white matter significantly increased after PC compared to normoxic controls ($P<0.05$). Furthermore, these numbers also increased in PC piglet tissue as the recovery time prior to sacrifice increased. These studies demonstrate that hypoxic-preconditioning enhances proliferation in the SVZ of the newborn piglet brain.

Location: Row - L; Number - 105 Judging Time: 12:30p.m. - 2:00 p.m.

Presenter(s): Varun Padmanaban Email: vp348@drexel.edu
Major: Biology BS/MD Academic Field: Biological Sciences
Faculty Advisor: Daniel Maranda Email: dm562@drexel.edu

Characterization of Drosophila behavioral defects associated with lilliputian mutants and its relevance to FRAXE Fragile X Syndrome

Author(s): Varun Padmanaban, Ginnene DiStefano

FRAXE is rare heritable form of mental retardation. Patients display symptoms such as motor incoordination, postural defects and reduced abilities in learning and memory with varying severity. FRAXE has been linked to mutations in the FMR2 gene on the X chromosome. To gain a deeper understanding of FRAXE, it is important to understand the influence of the gene on neuroanatomy and behavioral processes it regulates.

Using Drosophila melanogaster as a model system, we created a model for FRAXE by targeting the Drosophila homolog of FMR2, a gene names lilliputian. Analysis of our model shows phenotypes similar to human symptoms. Initial evaluation of our model has shown defects in posture, motor coordination, reflex behavior sand learning and memory. Neuroanatomical analysis of our model has shown defects in the axon morphology of the mushroom body, a structure is required for learning and memory. Little research has been done to date regarding FRAXE and the pleiotropic nature of this disease. In order to properly treat these patients we need to identify the cellular defects inherent to these symptoms.

Location: Row - M; Number - 116 Judging Time: 12:30p.m. - 2:00 p.m.

Presenter(s): George Payne Email: gmp44@drexel.edu
Major: International Area Studies Academic Field: International Area Studies
Faculty Advisor: Dr. Eva Thury Email: Thury@drexel.edu

The Living Room Revolution

Author(s): George Payne

Initially Aldous Huxley, author of the book Brave New World, motivated me to pursue fictional writing with a futurological perspective. His work forced me to question the world around me, gaze through the lens of epistemology, and formulate new ideas about "End of the World" literature. I used works by Tom Moylan, Raffaella Baccolini, and Benjamin Kunkel to help me define a true dystopia, then, combining these readings with a few of Huxley's works, both his fiction and his supplementary material, I created a practical dystopian future world for my story. After appropriately piecing together the setting, I used books on the art of creative writing by Mark Baechtel, Orson Scott Card, Howard Mittlemark and Sandra Newman to help guide my creative writing processes.
My story, entitled The Living Room Revolution, is about a traveling, poet-journalist in the year 2160, who seeks to win an internationally esteemed rap competition, called the Mind-Volley Summit. The young man, Mego Nnowair, documents his journey and the people he meets along the way with the help of his orbiting monitor and silent companion, DBH. The two are met by mysterious challenges and tragedies on their way to the event, but as he gets closer to his goal, he realizes there is more to his fateful journey than he could have ever expected.
Overall, my study of time, society, communication, and science fiction writing have helped me to become a better creative writer. The Living Room Revolution will be an ongoing venture for me beyond the limits of this project, but the opening chapters are available for these 2012 Research Days.

Location: Row - F; Number - 50 Judging Time: 11:00a.m. - 12:30p.m.

Presenter(s): Maria Petrongolo Email: mep760@gmail.com
Major: Psychology Academic Field: Psychology
Faculty Advisor: Naomi Goldstein Email: neg23@drexel.edu

Child Preference and Ultimate Issue Testimony in Child Custody Evaluations

Author(s): Maria Petrongolo, Amanda D. Zelechoski, Christy Lane, Jamie Feehan, Naomi Goldstein

Under the 2003 Uniform Marriage and Divorce Act, child custody arrangements are determined by considering the "best interests" of the child. A key component in determining the child's "best interest" is child's preference, or the degree to which an evaluator took the child's opinion into account. Data from 142 child custody evaluation reports were used to examine the relationship between the type of conclusion rendered by the evaluator and whether the report included information about the child's preference. Findings revealed a significant relationship between inclusion of child preference and

presentation of an ultimate legal issue conclusion. Implications will be presented.

Location: Row - G; Number - 64 Judging Time: 11:00a.m. - 12:30p.m.

Presenter(s): Emilie Pinkasavage Email: erp52@drexel.edu
Major: Psychology Academic Field: Psychology
Faculty Advisor: Pamela Geller Email: pg27@drexel.edu

The Role of Religious Coping in African American Women following Pregnancy Loss

Author(s): Emilie Pinkasavage , Anne Sekley, Efrat Eichenbaum, Mitra Khaksari, Pamela Geller

Introduction: The rate of stillbirth and miscarriage is approximately 2.3 times higher in African American women than non-Hispanic White women (MacDorman & Kirmeyer, 2009). However, few studies address African American women's coping experiences following pregnancy loss.

Religious coping (classified as positive or negative) is a common strategy following pregnancy loss (e.g., El-Khoury, et al., 2004). In the current study we examined two hypotheses: 1. Negative religious coping will be significantly associated with despair. 2. Positive religious coping will be significantly related to seeking instrumental support.

Methods: Participants were self-identified African American/Black women, between ages 19 and 50, who experienced a pregnancy loss in the past six months to four years.Several recruitment methods (e.g., Ob/Gyn clinics, churches, and flyers) are utilized. Women participate in-person, over the telephone, or online. Measures include a demographics questionnaire and several quantitative instruments.

Results: To date, 26 African American women have completed the study. Bivariate linear regressions were conducted to examine both hypotheses. Preliminary results revealed a significant association between positive religious coping and seeking instrumental support ($Y = 0.48$, $X = 1.24$, $SEb = 0.19$, $p < .05$, $R2= 0.22$). A significant relationship between negative religious coping and despair was also found ($Y = 0.59$, $X = 2.15$, $SEb = 0.18$, $p < .05$, $R2= 0.34$). Thus, both hypotheses were supported.

Conclusion: Positive and negative religious coping may predict different post-loss outcomes in African American women. This finding has implications for future research and clinical practice.

Location: Row - I; Number - 79 Judging Time: 12:30p.m. - 2:00 p.m.

Presenter(s): Ariel Pollak
Email: ahp37@drexel.edu
Major: Psychology
Academic Field: Psychology
Faculty Advisor: Ariana Tart-Zelvin
Email: ariana.s.tart-zelvin@drexel.edu

A Re-evaluation of the Relationship Between Gender and Emotional Expression

Author(s): Ariel Pollak, Yesenia Garcia, Hannah Mindl Gittler, Khushbu Patel, Kate Steinberg, Kenny Wittwer

Extant literature has examined differences in emotional expression based on gender, but has failed to reexamine this relationship in the contect of a college-age population (Barrett et al., 1998; Grossman & Wood, 1993). The present study, therefore, administered an adapted affect survey to 34 undergraduate psychology students. The results support the hypothesis that males are more likely to avoid emotional expression ($M = 2.5$, $SD = 17.79$), while females are more likely to engage in emotional expression ($M = 26$, $SD = 18.46$), and that a significant relationship may exist ($t(32) = -3.17$, $p < .01$). This information is important in leading to the future identification of factors that influence gender differences in emotional expression.

Location: Row - E; Number - 41
Judging Time: 11:00a.m. - 12:30p.m.

Presenter(s): Ana Prelic
Email: anprelic@gmail.com
Major: Psychology/Criminal Justice
Academic Field: Psychology
Faculty Advisor: Naomi E.S. Goldstein
Email: neg23@drexel.edu

Does intelligence predict school bonding among delinquent youth?

Author(s): Ana Prelic, Amanda Dovidio-Zelechoski, Christy Lane, Naomi E. S. Goldstein

This study examined the relationship between intelligence and school bonding among delinquent youth. 2,708 youth files were collected from two large information tracking systems for delinquent youth in the Philadelphia area between 1994 and 2004. The relationship between youths' intelligence and their levels of school bonding were examined. Results revealed a significant relationship between Verbal IQ scores and school bonding, with higher VIQ scores predicting higher school bonding scores. No significant relationships were found between Performance IQ scores and school bonding or between Full Scale IQ scores and school bonding. Implications for forensic evaluators, psychologists, and lawyers are reviewed.

Location: Row - B; Number - 14 Judging Time: 11:00a.m. - 12:30p.m.

Presenter(s): Ana Prelic Email: anprelic@gmail.com
Major: Psychology/Criminal Justice Academic Field: Psychology
Faculty Advisor: Naomi E.S. Goldstein Email: neg23@drexel.edu

Does intelligence predict school bonding among delinquent youth?

Author(s): Ana Prelic, Amanda Dovidio-Zelechoski, Christy Lane, Naomi E. S. Goldstein

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Location: Row - E; Number - 49 Judging Time: 11:00a.m. - 12:30p.m.

Presenter(s): Othmane Rifki Email: or36@drexel.edu
Major: Physics Academic Field: Physics
Faculty Advisor: Gordon Richards Email: gtr@physics.drexel.edu

Precision Characterization for Prototype Electronics for read out of the 3.2 Gigapixels camera for LSST

Author(s): Othmane Rifki

The Large Synoptic Survey Telescope (LSST) is an 8.4m ground based telescope that will be used to produce a 6-band wide-field deep astronomical survey of the southern sky. The survey covers a wide range of astronomical topics such as using the deformation of the images of distant galaxies to map the distribution of dark matter in the universe. For this purpose LSST will use a 3.2 Giga pixel camera characterized by a high segmentation, low noise, fast read out, and sensitive to light in the range of 0.3 to 1.1 Micron. University of Pennsylvania's instrumentation group is involved in the development of the front end electronics for the LSST camera readout. The goal is to achieve a highly compact low power read out with a signal sensitivity of 4 microVolts per electron and a rate of 500 Kilopixels

per second. To prepare for the first vertical slice test, a pulser driven electronic signal is used to mimic the CCD signal in order to understand the noise level achieved, the pattern effects, and the channel-to-channel interference. We will perform read out consistency checks in order to determine a pedestal background and electronic noise baseline. Then, introduce pulses to monitor the time evolution of the response, the cross talk, and the persistence effects. My work will aid in performing these studies by developing analysis tools based on the high energy physics data analysis interface ROOT.

Location: Row - A; Number - 8 Judging Time: 11:00a.m. - 12:30p.m.

Presenter(s): Giselle Saleet Email: gsaleet@gmail.com
Major: Psychology Academic Field: Psychology
Faculty Advisor: Dr. Maureen Gibney Email: maureen.gibney@drexel.edu

Positive and Negative Effects of the No Child Left Behind Act of 2001

Author(s): Giselle Saleet

Education reform has been a major political topic in the United States since the 1960s. Various efforts have been made by past administrations to improve education in America, the most recent being the No Child Left Behind Act of 2001 (NCLB). NCLB was designed to bridge the achievement gap between high and low performing students especially when that gap had been created by economic disadvantages. Public school students are categorized into achievement levels (basic, proficient, and advanced) based upon statewide assessment scores. States were responsible for standardizing each level. Students across the country were expected to be at the proficiency level by 2014. There have been several studies of NCLB's impact on student achievement. This poster presents the positive and negative aspects of NCLB guidelines as implemented in the classroom. Teachers reported higher levels of organization within their classroom due to the NCLB requirements. Regardless of the positive effects of NCLB legislation on classroom organization, there has been no significant report on improvement in overall student achievement and performance.

Location: Row - E; Number - 46 Judging Time: 12:30p.m. - 2:00 p.m.

Presenter(s): Marli Schecker Email: mss83@drexel.edu
Major: Psychology Academic Field: Psychology
Faculty Advisor: Naomi Goldstein Email: neg23@drexel.edu

Gender Differences in Adolescents' Risks of Confessing During Interrogations

Author(s): Marli Schecker, Sharon Messenheimer Kelley, Erika Foster, Maria Petrongolo, Naomi E. S. Goldstein

This study examined gender differences in the self-reported likelihood of offering true confessions in response to a variety of police interrogation techniques and whether suggestibility, mental health symptoms, or IQ mediated the gender- confession relationship. 168 juvenile justice youth completed the Perceptions of Coercion in the Holding and Interrogation Process (P-CHIP), a measure that evaluates an individual's description of behavior during a police interrogation. Results revealed that girls were significantly more likely to report that they would offer a true confession, but neither suggestibility, mental health symptoms, nor IQ mediated the gender-confession relationship.

Location: Row - F; Number - 51 Judging Time: 12:30p.m. - 2:00 p.m.

Presenter(s): Sonia Shah Email: sas358@drexel.edu
Major: Biology Academic Field: Biological Sciences
Faculty Advisor: Dr. Itzhak Fischer Email: Itzhak.Fischer@drexelmed.edu

Analysis of neural stem cells derived from human embryonic stem cells: Establishing differentiation protocols and testing transplants in a model of spinal cord injury

Author(s): Sonia Shah, Maryla Obrocka, Joseph Bonner, Itzhak Fischer

Spinal cord injury (SCI) is a severe condition that affects many young adults due to car accidents, falls, or violence. The complex sequence of primary and secondary injury leads to death of neural cells and loss of neuronal connectivity. Treatments are ineffective, but ongoing research on cell replacement therapy has demonstrated that transplantation of neural stem cells (NSC), which can be differentiated into lineage-restricted progenitors, is an attractive therapeutic strategy for SCI. Transplants, of neuronal- and glial-restricted progenitors (NRP/GRP), derived from rodent fetal tissue, differentiate into neurons and glial cells after transplantation into rats with SCI; however, it remains important to determine whether similar cell replacement therapy can be effective with human cells for clinical trials. Human cells can be derived from human embryonic stem cells (hESC) or fetal tissue. Despite the need for predifferentiation protocols to derive NSC from hESC, these cells offer a practical advantage over fetal tissue. For example, hESC are more widely accessible, have decreased cellular heterogeneity, and are easier to store. The purpose of this study is 1)to determine whether multipotent NSC derived from hESC can be directed towards restricted progenitors, NRP/GRP, 2)to examine the phenotypic composition of NRP/GRP in vitro, and 3)to evaluate the survival, differentiation, and migration after transplantation into the injured spinal cord. Using GFP-labeled NSC obtained from the H9 (WA09) hESC line (Life Technologies), our studies show that the predifferentiation protocols used to derive NRP/GRP from hESC-derived NSC generate a heterogeneous

population of cells while maintaining GFP expression throughout multiple passages.

Location: Row - G; Number - 58 Judging Time: 11:00a.m. - 12:30p.m.

Presenter(s): Guovanna Shoukri Email: gcs42@drexel.edu
Major: Biology Academic Field: Biological Sciences
Faculty Advisor: Dr. Daniel Marenda Email: dm562@drexel.edu

The Role of Kismet on Posture, Behavior, and Morphology in the Drosophila model of CHARGE Syndrome

Author(s): Guovanna Shoukri

CHARGE Syndrome, an autosomal dominant birth defect characterized by a number of developmental anomalies, is caused by mutations in the Chd7 gene. The Drosophila homolog of CHD7 is kismet (kis). Decreased levels of Kismet protein in flies has shown to result in motor co-ordination defects and hypotonia-like phenotypes that mimic symptoms typically found in CHARGE patients, which suggests that kismet may have an effect on the mechanisms that regulate motor function. The defect in motor co-ordination was assessed at different stages of development by larval crawling and adult climbing assays. We also investigated the glutamatergic neuromuscular junction (NMJ) of Drosophila. Glutamate, a neurotransmitter released from the motor neuron, binds to ionotropic glutamate receptors (iGluRs) on the post-synaptic muscle. We used immunohistochemistry on larval body wall sections of flies to test the effect of Kismet protein knockdown in post-synaptic and pre-synaptic regions of the NMJ. We quantified active zones, the sites of glutamate release, in flies with 90% ubiquitous knockdown of kis. We observed that with a decrease in Kismet protein, there is an increase in the number of pre-synaptic active zones. Additionally, we tested the effects of decreased Kismet protein on the number of boutons (terminal structures of motor neurons). We observed that in flies with 90% ubiquitous kis knockdown there was an increase in the total number of 1s boutons, a subset of terminal structures at the NMJ. The postural and behavioral defects taken together with morphological changes at the NMJ in the CHARGE model flies suggests that there is a similar importance of the Kismet protein in flies that may be extended to CHARGE patients. Our study will contribute to better understanding the etiology of CHARGE Syndrome.

Location: Row - I; Number - 76 Judging Time: 11:00a.m. - 12:30p.m.

Presenter(s): Sylvia Shoukri Email: scs72@drexel.edu
Major: Biology/ Pre-Med Academic Field: Biological Sciences
Faculty Advisor: Dr. Daniel R. Marenda Email: dm562@drexel.edu

Exploring the Mechanism of CHARGE Syndrome through the MARCM Technique and Methylated Histone Tags

Author(s): Sylvia Shoukri, Victoria Baccini

One in 10,000 infants a year are burdened with the autosomal dominant disorder CHARGE syndrome. Although this disease is rare, studies have shown that 2/3 of all reported cases of CHARGE patients have a mutation on the Chd7 gene, which is crucial for proper development. An excellent model organism used to study the pathogenesis of this and other developmental disorders is Drosophila melanogaster, more commonly known as the fruit fly. In this model, the homologue of Chd7 is the transcription factor, kismet. Through larvae, pupae, and adult fly brain dissections, immunohistochemistry and the MARCM technique, we are working to examine the etiology of this disorder and explore possible factors that regulate the expression of kismet (including TGF-β, FTZ-1, and Cohesion). Additionally, we examine the effect kismet has on histone markers and the methylation tags, histone 3 lysine 4 (H3K4) and histone 3 lysine 27 (H3K27), which are key factors in gene activation and silencing, respectively. The ultimate goal for our research is to unravel the mechanism behind this disorder and possibly find therapeutic targets in the near future.

Location: Row - K; Number - 100 Judging Time: 11:00a.m. - 12:30p.m.

Presenter(s): Ava Skolnik Email: ams582@drexel.edu
Major: Psychology Academic Field: Psychology
Faculty Advisor: Mary Spiers Email: spiersm@drexel.edu

Internet Addiction and Sleep

Author(s): Ava Skolnik, Jessica Bielski, Seniz Warner

Internet addiction is very common among college students. The question is whether internet addiction leads to inadequate sleep among college students. Therefore the purpose of the present study was to determine whether internet addiction is significantly related to inadequate sleep among college freshmen. The participants were freshmen from 3 psychology classes. They were asked to fill out a survey containing questions about their usage of the internet and how much sleep they get. Results indicated that approximately eighty-two percent (n = 28) of the sample reported no signs of sleep loss due to internet addiction. It was concluded that in the convenience sample, there was not a significant relationship between internet addiction and insufficient sleep.

Location: Row - J; Number - 83 Judging Time: 11:00a.m. - 12:30p.m.

Presenter(s): Julie Vayner Email: jvv25@drexel.edu
Major: Psychology Academic Field: Psychology
Faculty Advisor: Eva Thury Email: thury@drexel.edu

Psychopathy and Antisocial Personality Disorder in Hannibal Lecter Through Cinema

Author(s): Julie Vayner

There are many misconceptions among the general public of what psychopathy is and how it relates to antisocial personality disorder (APD) based on the similarities in symptoms. The community tends to assume that serial killers are “psychopaths” or “insane criminals”. However, often this is a misunderstanding. “Almost all participants identified as psychopaths by the PCL-R also met the criteria for APD, but most individuals identified with APD were not psychopaths,” (Skilling et al. p. 28) meaning that psychopathy and APD are not synonymous. Through the fictional character, Hannibal Lecter as developed through the quadrilogy of movies consisting of: Hannibal Rising, Red Dragon, The Silence of the Lambs, and Hannibal, even the most perilous serial killers may not be psychopathic. There has been literature published on the evidence that Hannibal Lecter portrays either psychopathy or APD. However, there is not much evidence for a comparison of the two disorders in regards to serial killers such as Hannibal Lecter. Using the PCL-R alongside with the DSM-IV I was able to compare Hannibal’s behavioral and interpersonal characteristics with the disorders. My findings suggest that Hannibal Lecter accurately portrays someone with APD, but not necessarily psychopathy despite his numerous murders. Although this is not a scientific study, this research is useful to the community to promote awareness of what psychopathy is and the stigma it gives to the serial killer persona. Further research in comparing psychopathy to APD in various populations is recommended to continue to eliminate incorrect assumptions of these disorders.

Location: Row - B; Number - 16 Judging Time: 11:00a.m. - 12:30p.m.

Presenter(s): Gavin Youngs Email: gay24@drexel.edu
Major: English Academic Field: English, Philosophy
Faculty Advisor: Dr. Eva Thury Email: thury@drexel.edu

Alice's Adventures in the Matrix

Author(s): Gavin Youngs

The notion of religious identity is a hot issue in today's society. From the political sphere to the social, accusations fly about where people place their faith. Recently, this researcher has uncovered an interesting trend that sheds light on modern America's faith structure.

Our entertainment industry's offerings are becoming increasingly laced with gnostic elements. Hans Jonas provides a historical grounding in the nature of Gnosticism. Harold Bloom gives perspective on the modern expression of this philosophy in modern American culture. Here, some of the most famous works of previous decades are analyzed to illustrate this growing trend. Lewis Carroll's Alice stories demonstrate a sort of Gnostic Hell. Richard Bach uses flight as a metaphor for enlightenment. The Matrix presents perhaps the quintessential example of a reality constructed by evil sentience with the intent of keeping its inhabitants ignorant of the true nature of reality. These findings reveal opportunities for better understanding modern American sociology by better understanding the entertainment they gravitate toward.

Location: Row - D; Number - 36 Judging Time: 12:30p.m. - 2:00 p.m.

Presenter(s): Lisa Zhao Email: lmz28@drexel.edu
Major: Psychology Academic Field: Psychology
Faculty Advisor: Dr. Maria T. Schultheis Email: schultheis@drexel.edu

Driving Behaviors and Self-Rated Driving Ability in Multiple Sclerosis Patients

Author(s): Lisa Zhao

Multiple sclerosis (MS) is a neurodegenerative disease which can impact the physical performance and cognitive skills involved with driving abilities. This study investigates the impact of particular driving behaviors on how patients perceive their own ability to drive. Thirty adults, average age of 46.8 (SD = 9.61), with different forms of MS (10.0% primary-progressive, 86.7% relapsing-remitting, 3.3% secondary progressive) answered a driving questionnaire regarding driving behaviors such as years since licensure, average miles per week driven, average days per week driven, accidents involved after MS diagnosis and tickets received after MS diagnosis. All of these factors, along with years since MS diagnosis, were individually analyzed for their correlation with self-rating on ability to drive. Driving self-rating was relatively high, with an average rating of 8.20 (SD= 2.20). No factors were highly correlated with self-rating or were statistically significant. The highest correlation appeared to be miles per week driven and self-rating, but was still weakly correlated, $r(22) = .162$, $p = .450$. It was concluded that these driving behaviors do not have influence over one's own perceived driving ability given MS diagnosis and specific driving behaviors, particularly if the average self-rating on driving capability itself was high.

Location: Row - B; Number - 17 Judging Time: 12:30p.m. - 2:00 p.m.

Presenter(s): Stephanie Zimmer Email: sez29@drexel.edu
Major: Biological Sciences Academic Field: Biological Sciences

Faculty Advisor: Jeffrey Twiss Email: jlt98@drexel.edu

Local translation of Ribosomal Protein L37 mRNA in Distal Sensory Axons

Author(s): Stephanie Zimmer, Linh Chau, Cynthia Gomes, Jeffrey Twiss

Neurons are large cells that extend axonal processes for centimeters in rodents and over a meter in humans. They have evolved mechanisms for communicating over these long distances – localized protein synthesis is one of these mechanisms. A diverse complement of mRNAs is transported into axonal processes. Surprisingly, this includes some mRNAs encoding components of the ribosome. Since ribosome biogenesis is thought to occur in the nucleus, the rationale for transporting ribosomal protein mRNAs into axons is unclear. Ribosomal protein L37 (rpL37) mRNA is abundant in rodent sensory axons. Thus, we have asked whether axonal rpL37 mRNA is translated and what function its protein might serve. The 3'UTR of rpL37 drives transport of rpL37 mRNA into axons. A fusion protein construct encoding rpL37-FLAG-AcGFP + 3'UTR of rpL37 displayed nucleolar localization in non-neuronal cells and axonal localization in neurons. By FRAP analyses, the axonal rpL37-FLAG-AcGFP fluorescence was clearly generated by localized translation of axonal rpL37-FLAG-AcGFP mRNA. Moreover, axonal rpL37 fusion protein seems to be associated with subcellular structures, possibly ribosomes, since it is relatively non-mobile. Although theories on ribosome function predict that loss of a ribosomal protein would disrupt ribosome function, DRG neurons depleted of rpL37 mRNA by siRNA are surprisingly viable and extend axons with normal morphology. Future studies will be needed to determine the exact function of axonal rpL37 and whether the axonally generated rpL37 is added to the axonal ribosome locally.

Location: Row - G; Number - 60 Judging Time: 11:00a.m. - 12:30p.m.

Graduate Posters

Presenter(s): Alexa Bonacquisti Email: anb35@drexel.edu
Major: Clinical Psychology Academic Field: Psychology
Faculty Advisor: Pamela A. Geller, Ph.D. Email: pg27@drexel.edu

Prenatal Depression in Women Living with HIV

Author(s): Alexa Bonacquisti, Pamela A. Geller, Ph.D., Erika Aaron, CRNP

HIV-infected individuals have twice the risk of developing major depressive disorder compared with HIV-uninfected individuals, and these depressive symptoms have serious implications for disease progression, quality of life and medication adherence (Ciesla & Roberts, 2001; DiMatteo et al., 2000; Rabkin, 2008; Kacanek, 2010). This is particularly relevant for women, as approximately one in five women experience major depression at some point in their lives (Kessler et al., 1997). Taken together, these studies conclude that depression is a serious concern for HIV+ women, specifically during the prenatal period (Adler et al., 2007; Moehler et al., 2006). Given the unique medical and psychosocial demands these women face, research addressing the impact of depression on HIV+ pregnant women is needed (Psaros et al., 2009). The current study examines rates and predictors of depression among HIV+ and HIV- women, hypothesizing that HIV+ women will experience higher rates of prenatal depression as compared to HIV- women. Risk factors for prenatal depression were also assessed to determine if they differ according to HIV status. Prenatal data from 90 women were collected from the Partnership Plus Clinic and Women's Care Center. Rates of prenatal depression were assessed using the CES-D and confirmed using the Structured Clinical Interview for DSM-IV-TR (SCID-I). Preliminary findings suggest that HIV+ women demonstrate higher rates of prenatal depression compared to HIV- women, and that HIV+ women may exhibit unique predictors of depression which differ from HIV- women. This poster will describe these findings, and will discuss clinical implications and directions for future research.

Location: Row - K; Number - 96 Judging Time: 11:00a.m. - 12:30p.m.

Presenter(s): Erica Caden Email: epc24@drexel.edu
Major: Physics Academic Field: Physics
Faculty Advisor: Charles Lane Email: lane@duphy4.physics.drexel.edu

Studying Neutrino Directionality with Double Chooz

Author(s): Erica Caden

The first results from Double Chooz with 100 days of data measured the last unknown neutrino mixing angle sin^2(2theta_13) = 0.085 +/- 0.051. The a major contribution to the uncertainty is the backgrounds. Using the incoming neutrino directionality we can further separate the inverse beta decay signal from backgrounds. The CHOOZ experiment completed this analysis and found that the neutrino source can be located to within a cone of half-aperture of 18 degrees at the 68\% C.L. The increased statistics of Double Chooz and improved detector response will improve this result.

Location: Row - L; Number - 106 Judging Time: 11:00a.m. - 12:30p.m.

Presenter(s): Jennifer Chen Email: jyc29@drexel.edu
Major: Chemistry Academic Field: Chemistry
Faculty Advisor: Jun Xi Email: jx35@drexel.edu

Assessing EGF-induced Changes of Cell Adhesion Using Dissipation Monitoring.

Author(s): Jennifer Chen, Ammar Shahid, Marce P. Garcia, Jun Xi

Cell adhesion is an important cellular process for cell survival, differentiation, and migration. This process of cell de-adhesion, like many other cellular process exhibits a complex sequence of steps. Cellular de-adhesion induced by epidermal growth factor (EGF) is a critical step of normal embryonic development, wound repair and regeneration, inflammatory response, and tumor cell metastasis. We have developed a novel method using quartz crystal microbalance with dissipation monitoring (QCM-D) to monitor the changes in cell de-adhesion due to EGF induction in MCF-10A cells. We have successfully monitored changes in adhesion in a monolayer of MCF-10A cells. In addition we have identified the sequence of changes as first a rapid de-adhesion step, followed by a transition step, and ending with a slow re-adhesion step. Lastly, we demonstrated the process of cellular de-adhesion process is regulated temporally by the downstream pathways of EGFR signaling such as the PI3K, MA PK/ERK, and PLC pathways. The QCM-D provides a real time label-free sensor technology that can be used quantitatively to investigate the cellular changes during cell de-adhesion. The QCM-D technique can be a useful application in studying other cellular process such as cell signaling and trafficking and can potentially be a useful in vitro method for drug and biomarker screenings.

Location: Row - H; Number - 68 Judging Time: 11:00a.m. - 12:30p.m.

Presenter(s): Drew Cronin Email: dtc33@drexel.edu
Major: Environmental Science Academic Field: Environmental Science
Faculty Advisor: Gail Hearn Email: gwh26@drexel.edu

Bushmeat Hunting on Bioko Island, Equatorial Guinea Suggests a Network of Organized Crime

Author(s): Drew Cronin, Stephen Woloszynek, Michael O'Connor, Gail Hearn

Bushmeat hunting represents the only significant threat to vertebrate biodiversity on Bioko Island, Equatorial Guinea. From 1997-2010, over 197,000 bushmeat carcasses were recorded for sale in the Malabo bushmeat market by the Bioko Biodiversity Protection Program. An analysis of market dynamics was conducted in which carcasses were classified by taxa, capture method, and geographic origin. Three distinct time periods, termed "epochs", were identified in which rates of appearance of carcasses in the market (carcass rates) for multiple taxa demonstrated changes in average carcass rates, temporal trends, and seasonal variation. Results suggest a trend towards commerciality: total carcass rates have increased dramatically, shotgun hunting has become the predominant capture method, and carcass rates of primates, Bioko's most threatened fauna, have more than quadrupled since the project's inception. The market exhibits seasonal variation in offtake, but shotgun hunting and taxa commonly taken by shotgun do not follow this pattern. While these trends represent a threat to a number of species, Bioko's seven monkey species are at particular risk. A 2007 primate hunting ban lacked enforcement and failed to provide any protection. Additionally, construction is ongoing on a new road bisecting the Gran Caldera/Southern Highlands Scientific Reserve. Previously offering protection via isolation, the Reserve remains the only refuge for wildlife on the island. Given the observed bushmeat market trends, concurrent with continuing development on Bioko, immediate conservation action and meaningful enforcement are needed to preserve what remains of Bioko's primates and other wildlife.

Location: Row - J; Number - 85 Judging Time: 12:30p.m. - 2:00 p.m.

Presenter(s): Elizabeth Culnan Email: ejc73@drexel.edu
Major: Psychology Academic Field: Psychology
Faculty Advisor: Jacqueline D. Kloss Email: jdk29@drexel.edu

Insufficient Sleep and Weight Status in High School Students: Should we be Focusing on the Extremes?

Author(s): Elizabeth Culnan, Stephanie Brooks-Holliday, Brian P. Daly, Richa Aggarwal, Jacqueline D. Kloss

The relationship between insufficient sleep and weight status among adolescent populations has yielded equivocal findings. Thus, this study sought to investigate the relationship between length of sleep and weight status by analyzing data from 9,321 high school students on the 2007 National Youth Risk Behavior Survey. Weight and height were assessed by asking, "How much do you weigh without your shoes on?" and "How tall are

you without your shoes on?" BMI was then calculated based off these responses. Sleep duration was assessed by asking, "On an average school night, how many hours of sleep do you get?" In order to examine all ranges of sleep duration, our variable was categorized into three categories: short sleep duration (five or less hours); usual sleep duration (six to eight hours); and, longer sleep duration (nine or more hours). Multinomial logistic regression was conducted and adjusted odds ratios were calculated, controlling for sex, age, and race/ethnicity, which revealed that individuals with short sleep duration were not more likely to be overweight than individuals with usual sleep duration (AOR, 1.09; 95% CI, 0.85-1.40) or individuals with longer sleep duration (AOR, 0.99; 95% CI, 0.78-1.26). Conversely, students who reported short sleep duration had higher odds of being in the obese category (AOR, 1.47; 95% CI, 1.20-1.80) as compared to students who reported receiving the usual amount of sleep or a longer amount of sleep (AOR, 1.14; 95% CI, 0.85-1.53). These results have implications for prevention and intervention programs that address sleep and weight among adolescents.

Location: Row - F; Number - 55 Judging Time: 12:30p.m. - 2:00 p.m.

Presenter(s): Mitchell D'Rozario Email: mrd65@drexel.edu
Major: Biology Academic Field: Biological Sciences
Faculty Advisor: Daniel R. Marenda Email: dm562@drexel.edu

Novel Functions of Class I bHLH protein Daughterless in Post-Mitotic Cells

Author(s): Mitchell D'Rozario, Tina Hu, Mohammad Nayal, Daniel R. Marenda

Proper neurodevelopment in all animals depends on basic helix-loop-helix (bHLH) proneural transcription factors that regulate how an undifferentiated cell develops into a neural precursor cell. TCF4, a vertebrate type I bHLH proneural protein has been linked to several neuropsychiatric diseases such as Pitt-Hopkins Syndrome (a disease characterized by severe mental and motor retardation) and
schizophrenia. Daughterless (da), the only type I bHLH in flies, is an ubiquitously expressed protein with an established function in sex determination, differentiation of mesoderm, and as a proneural gene for establishing the central and peripheral nervous system. Consistent with its role as a nuclear transcription factor, Da has been previously localized in the nucleus of multiple cells in the CNS; however, we have preliminary data that suggests that Da is also localized outside of the nucleus within the axons of multiple neurons. We also have evidence that Da functions to regulate axonal development in post-mitotic cells, a novel function for this proneural bHLH factor. We suggest that the analysis of Da and TCF4 in neurons can expand upon the existing studies for these diseases, allowing a better understanding of the novel role of daughterless in post-neurogenesis, neural development, and TCF4 in Pitt-Hopkins Syndrome pathogenesis.

Location: Row - I; Number - 74 Judging Time: 11:00a.m. - 12:30p.m.

Presenter(s): Edward Damon
Email: edward.damon@gmail.com
Major: Physics
Academic Field: Physics
Faculty Advisor: Jelena Maricic
Email: jelena@physics.drexel.edu

Double Chooz SPE Inefficiency

Author(s): Edward Damon, Jelena Maricic

The Double Chooz Experiment is a reactor neutrino experiment designed to measure the neutrino mixing angle Θ13 . While first results have introduced strong limits on the value of Θ13 , our systematic errors remain larger than initially predicted. These errors are partially due to an anomalous energy response- a non-linearity in the energy scale- which is corrected for by the introduction of a logarithmic energy response function. In this poster, we show our work in isolating one possible source of the energy non-linearity, SPE inefficiency, and examine its effects. SPE inefficiency refers to an inefficiency in including charge from PMTs (Photo-Multiplier Tubes) which have only a Single Photo-Electron response, i.e. a very small signal. The current energy reconstruction algorithm can exclude channels which have a very small but non-zero amount of signal, causing a loss of charge. We use Z-axis deployed radioactive sources (including Ge68, Cf252, Cs137, and Co60) to investigate the response of the detector. We show that SPE inefficiency is a significant component of the energy non-linearity, causing a loss of charge which varies with source energy.

Location: Row - B; Number - 19
Judging Time: 12:30p.m. - 2:00 p.m.

Presenter(s): Natalie Dixon
Email: nad33@drexel.edu
Major: Chemistry
Academic Field: Chemistry
Faculty Advisor: Elizabeth Papish
Email: ep322@drexel.edu

Modeling copper nitrite reductase with tris(triazolyl)borate ligands: The triazolyl nitrogen's influence on the structure, electronic properties, and reactivity

Author(s): Natalie Dixon, Mukesh Kumar, Anna Merkle, Nicolai Lehnert, Matthias Zeller, Elizabeth Papish

Bulky tris(pyrazolyl)borate (Tp) ligands of the scorpionate family are ubiquitous in enzyme modeling. Here, the under-utilized analogs, tris(triazolyl)borate (Ttz) ligands, support models of the active-site of copper nitrite reductase (CuNiR) during the enzymatic cycle. The extra nitrogen on the triazole ring, relative to pyrazole, changes the structures, electronic properties, and reactivities of the corresponding copper complexes. In addition,

IR spectroscopy reveals that H+ bonding to the third nitrogen changes the electronic properties of TtzR1,R2Cu(I)CO complexes and this influence could be applied to the reactivity of our TtzR1,R2CuNOx species. TtztBu,MeCuNOx complexes have been reported and show distinct structural features in the X-ray crystal structures and electronic differences according to EPR and UV-VIS when compared to corresponding TpR1,R2CuNOx complexes. Most notably, [PPN]+[(TtztBu,Me)Cu(I)NO2]- has been synthesized and characterized and allows for stoichiometric nitrite reduction to NO upon addition of acid. Anionic Cu(I) nitrite complexes are rare and this is the first stabilized by a scorpionate ligand due to the electron withdrawing properties of the triazolyl rings.

Location: Row - K; Number - 92 Judging Time: 12:30p.m. - 2:00 p.m.

Presenter(s): Abigail Dominy Email: abbydominy@yahoo.com
Major: Environmental Science Academic Field: Environmental Science
Faculty Advisor: Harold Avery Email: haltort@aol.com

The Visual Ecology of the diamondback terrapin (Malaclemys terrapin)

Author(s): Abigail Dominy, James R. Spotila, Harold W. Avery

Diamondback terrapins (Malaclemys terrapin) are a colorful estuarine turtle. Terrapins express conspicuous coloration and patterns on their skin and carapace. The goal of my research is to evaluate the visual ecology of the diamondback terrapin, which is potentially important in mate selection. To determine whether terrapins select mates based on coloration, I will genetically determine hatchling paternity and compare the phenotypes of males that were identified as fathers. Phenotypes will be measured using reflectance spectrophotometry and digital photography. Ambient light will be measured using irradiance spectrometry. The retinal physiology of the terrapin will be evaluated using a microspectrophotometer to account for the visual perception of the terrapin.

Location: Row - A; Number - 4 Judging Time: 12:30p.m. - 2:00 p.m.

Presenter(s): Wenjian Du Email: wd58@drexel.edu
Major: Chemistry Academic Field: Chemistry
Faculty Advisor: Jun Xi Email: jx35@drexel.edu

Using Nano Mechanical Approach to Study Enzyme Catalysis

Author(s): Wenjian Du

Cellulose is the skeleton structure of almost all plants, which makes it an unlimited source

as nature polymers. Cellulose hydrolysis is of great importance in the conversion of plant biomass to fuel, and has already attracted great interest from scientists in chemistry, biology and some other fields. Cellulase is a kind of enzyme which can break down the cellulose into simple sugars. Sugars can then be fermented into ethanol and many other products. Before hydrolytic cleavage, a process called enzymatic decrystallization will take place to break the aggregate of cellulose molecule and expose the cellulose molecule chains to active sites of cellulase enzyme. Although it has been speculated to be the rate-limiting step, the mechanism for decrystallization has not been elucidated. Using nano mechanical approach, such as micro-cantilever and AFM, we will study this process by examining the bending of cantilever or morphology change of cellulose bilayer produced by the cellulose decrystallization.

Location: Row - D; Number - 34 Judging Time: 12:30p.m. - 2:00 p.m.

Presenter(s): Alice Ely Email: alice.ely@gmail.com
Major: Clinical Psychology Academic Field: Psychology
Faculty Advisor: Michael R. Lowe, Ph.D. Email: ml42@drexel.edu

Interaction of dieting status with reward response to palatable food cues: an fMRI study

Author(s): Alice Ely, Anna Rose Childress, Ph.D.

Prior neuroimaging research from our lab (Coletta et al, 2009, J. Ab. Psych) has shown that individuals high or low in restrained eating demonstrate brain activation in response to food cues that parallels their food intake in lab studies. We extended these findings by comparing normal weight Nondieters, Historical Dieters (who typically counterregulate), and Current Dieters under the conditions that mimicked past lab studies. Participants were shown pictures of highly and moderately palatable foods while being scanned in an fMRI BOLD paradigm following an eight-hour fast and again after a liquid meal. In the Fed state, Historical Dieters showed elevated reward circuitry activation in response to highly palatable food, as compared to Nondieters, Current Dieters and to themselves when fasted. In contrast, Current Dieters showed increased reward activation in the Fasted state in both within- and between-group comparisons, in line with extant behavioral research. The parallels between eating behavior and regional brain activation across groups suggest that a neurophysiological vulnerability to overeat exists in normal weight young women that may increase susceptibility to weight gain in the long term.

Location: Row - J; Number - 89 Judging Time: 12:30p.m. - 2:00 p.m.

Presenter(s): Amy Evans Email: evans.amyn@gmail.com
Major: Psychology Academic Field: Psychology

Faculty Advisor: Arthur Nezu Email: amn23@drexel.edu

Relationship between Social Problem Solving and Psychological Distress in Expectant Women

Author(s): Amy Evans, Benjamin Hildebrand, Andrea Segal, Arthur M. Nezu, Christine Maguth Nezu

Animal and human studies have provided evidence that psychological distress during pregnancy may have adverse effects on the physical and psychological health of the child and mother. Given this evidence, it is important to learn about the ways in which women cope during pregnancy. Social problem solving is defined as the cognitive-behavioral process whereby an individual tries to cope with daily life problems. As such, the purpose of this study is to determine if social problem solving statistically predicts psychological distress, as defined by depressive and anxious symptomatology, during pregnancy. It is hypothesized that social problem solving will statistically predict psychological distress above and beyond demographic variables and stressful life events. Specifically, it is expected that maladaptive social problem solving, particularly negative problem orientation, will be positively related to depressive and anxious symptomatology and adaptive social problem solving will be negatively related to depressive and anxious symptomatology. Pregnant women seeking prenatal care from two university-based obstetric and gynecologic offices in Philadelphia, Pennsylvania are being recruited to fill out a series of self-report questionnaires, including the Life Experiences Survey, Pregnancy Experience Scale, Edinburg Postnatal Depression Scale, Pregnancy-Related Anxieties Questionnaire-Revised, and Social Problem Solving Inventory-Revised. A hierarchical multiple regression analysis will be used to determine whether social problem solving statistically predicts psychological distress above and beyond reported demographic variables and stressful life events. Data collection is currently being conducted with an expected total of 200 participants. If the hypotheses are supported, then problem-solving therapy may be effective in alleviating symptoms during pregnancy.

Location: Row - L; Number - 102 Judging Time: 11:00a.m. - 12:30p.m.

Presenter(s): Marcela Garcia Email: mpg36@drexel.edu
Major: Chemistry Academic Field: Chemistry
Faculty Advisor: Jun Xi Email: jx35@drexel.edu

Real-time measurement of cell signaling: A Quartz Crystal Microbalance with Dissipation Monitoring (QCM-D) Study on MCF-10A cells

Author(s): Marcela Garcia, Jennifer Chen, Ammar Shahid, Lynn Penn, Mauricio Reginato

Epidermal growth factor receptor (EGFR) plays an important role in cell growth, proliferation, motility, and differentiation. High levels of EGFR are associated with

development of breast cancer as its resistance to treatment with cytotoxic drugs. In this study, we examine the role of EGFR and their downstream signaling pathways in human MCF-10A mammary epithelial cells. We used the quartz crystal microbalance with dissipation monitoring (QCM-D) to monitor cellular responses to EGFR signaling in human MCF-10A mammary epithelial cells when treated with epidermal growth factor (EGF). Cellular responses to EGFR signaling were detected based in mass and viscoelasticity of the cells. These responses were associated with EGF-induced biological processes including cytoskeleton remodeling.

Location: Row - K; Number - 97 Judging Time: 12:30p.m. - 2:00 p.m.

Presenter(s): Austen Groener Email: amg338@drexel.edu
Major: Physics Academic Field: Physics
Faculty Advisor: David M. Goldberg Email: goldberg@drexel.edu

Triaxial NFW Projection Effects Upon Dark Matter Halo Concentrations

Author(s): Austen Groener

The Navarro-Frenk-White profile (NFW) is a mass density distribution most commonly used to model dark matter over a wide range of mass scales -from dwarf galaxies up to rich galaxy clusters. This density profile is characterized by a few different parameters, one of which is the concentration. The concentration of the halo describes how cuspy the inner density profile looks.

Other parameters needed to properly model dark matter in galaxy clusters include the semi-axes, which quantify the halo's likeness to that of a football. One of the differences between using tri-axial NFW profiles to model clusters which form in large simulations of dark matter particles (N-body simulations) with what is actually observed is that for a particular cluster mass the concentration of halos in simulations tend to be too large, typically by a factor of two.

One of the questions my research attempts to answer is: What effect do the orientations of the semi-axes have upon the concentration of the cluster? Consequently, can this effect be large enough to cause the discrepancy we see between observed and simulated cluster concentrations?

Location: Row - K; Number - 93 Judging Time: 11:00a.m. - 12:30p.m.

Presenter(s): Shauna Henley Email: shaunahen@gmail.com

Major: Biology/CNHP
Faculty Advisor: Jennifer J. Quinlan

Academic Field: Communication
Email: jjq26@drexel.edu

Identifying Food Safety Risks for Minority Racial/Ethnic Consumers'

Author(s): Shauna Henley, Dr. Susan E. Stein

Consumers represent the last line of defense against foodborne illness and it is estimated that a significant percentage of foodborne illnesses are caused by improper handling by consumers. Surveys have been an important tool to evaluate food safety knowledge and behaviors, but minority groups often lack representation among the sampling frame. These groups have distinct food cultures that may represent unique food safety risks, but remain unidentified due to small sample sizes or culturally irrelevant food handling questions. This study attempted to identify potential food handling practices unique to cultural practices. A comparable proportion of Caucasian, African American, Asian, and Hispanic consumers' were surveyed, regarding their current food handling knowledge, practices, and food consumption patterns. Phone surveys were administered in English, Spanish and Chinese, targeting residents in Philadelphia, Pennsylvania in the fall of 2011. The survey was based on the 2006 FDA/FSIS Consumer Food-Safety Survey with additional culturally themed questions derived from recent focus groups held with the target populations. Nonparametric survey analysis used SPSS 19.0.0. A total of 428 surveys were completed (25.5% Hispanic, 25.1% Caucasian, 24.8% African America, and 24.6% Asian). Minority consumers were more likely to ($p>0.05$) purchase live poultry, prepare offal and body parts (chitlins), not use a meat thermometer, and cook whole poultry in the oven overnight compared to Caucasians. The survey identified unique handling practices among minority groups, which may present an increased risk for foodborne illness. These groups may benefit from food safety education that is culturally appropriate, based on cultural food ways.

Location: Row - H; Number - 70

Judging Time: 12:30p.m. - 2:00 p.m.

Presenter(s): Yi Hu
Major: Biology
Faculty Advisor: Dr.Jacob Russell

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Assessing the diversity and stability of gut bacteria in Cephalotes varians

Author(s): Yi Hu, Jacob Russell, Corrie Moreau, Yemin Lan, Linh Chau, David Holway

Ants are ecologically dominant insects which have a variety of diets ranging from relatively balanced to extremely unbalanced in nutrient content. It has been hypothesized that herbivorous ants harbor stable, indigenous and coevolved gut bacterial communities and

receive greater contributions from gut bacteria than those found at higher trophic levels with more complete diets. In this study, we aimed to explore the diversity and stability of gut associates in Cephalotes varians, an herbivorous ant from the Florida Keys. Our 454 pyrosequencing data showed that the predominant bacterial taxa from workers of C. varians were found across all field-collected colonies, although there was a weak trend of greater similarity of microbial gut communities within (versus between) ant colonies. In lab-based dietary experiments, we examined one of the possible causes of this variation, diet. T-RFLP analyses revealed high similarity between gut microbes in different ants, even those fed on different diets. However, gut bacteria of C. varians shifted in response to feeding on pollen due to the higher relative abundance of Rhizobiales bacteria. And gut microbial communities showed a slight shift in response to sugar-only diets in one of the studied colonies. Combined, these results indicated that C. varians harbored qualitatively stable bacterial gut communities that may supplement nutritional deficiencies for their hosts. Differences in the relative abundance of ubiquitous bacteria among ant colonies might be due to their consumption of different diets at varied geographic locations or during different seasons.

Location: Row - F; Number - 52 Judging Time: 11:00a.m. - 12:30p.m.

Presenter(s): Anna Jaworski Email: asj46@drexel.edu
Major: Environmental Science Academic Field: Environmental Science
Faculty Advisor: Kenneth Lacovara Email: kjl24@drexel.edu

Drowned Forests and Buried Salt Marshes: Reconstructing Local-relative Sea Level Change along the Delaware River Estuary

Author(s): Anna Jaworski

As global temperatures rise, coastal communities and wetlands are at risk of destruction. Past research has shown a mean global rate of sea level rise of 1.8mm/yr for the 20th century (Church & White, 2006). While this information is important, it has two limitations. First, the figure subsumes the more recent, and far more rapid, rate of sea level rise measured from 1993 to 2008 at 3.11 +/- 0.6mm/yr (Ablain et. al., 2009). Second, this estimate reflects eustatic sea level changes. However, effects of sea level rise will not evenly manifest along coastlines. Therefore, it is important to assess changes on a site by site basis. In this study, we seek to determine the local-relative rate of sea level change for the Delaware Estuary coastline between the baymouth and the C&D Canal. Because low-gradient estuarine shorelines are particularly sensitive to small changes in sea level, this region will experience substantial coastal inundation. Since historic tide gauge records are not available for this site, we will use dendrochronology methods and salt marsh deposits to establish two independent proxies for the rate of sea level rise. Understanding the historic response of a coastline to sea level rise will help policy makers and natural resource managers decide what actions should be taken to anticipate the effects of climate

change on the estuary's fragile wetland biomes and coastal developments.

Location: Row - K; Number - 99 Judging Time: 12:30p.m. - 2:00 p.m.

Presenter(s): Noah Johnson Email: nmj37@drexel.edum
Major: Chemistry Academic Field: Chemistry
Faculty Advisor: Frank Ji Email: hj56@drexel.edu

The creation and characterization of self-assembling hydrogen bonded nanostructures exhibiting properties such as fluorescence, conductivity, and high storage capacities

Author(s): Noah Johnson, Dayne Swearer

Using a simple technique of solvent evaporation on different surfaces, we have managed to construct a wide range of hydrogen-bonded crystal structures. Several different chemical classes have been used to form a variety of nanostructures, including nanowires and nanopillars. The different crystal structures are shown to not only affect the appearance of the nanostructures, but alter their properties, such as fluorescence and conductivity. Because of this, they have the potential to be used in a many different applications, from light-emitting diodes to alternative energy production.

Location: Row - I; Number - 80 Judging Time: 11:00a.m. - 12:30p.m.

Presenter(s): Frank Jones Email: fj38@drexel.edu
Major: Physics Academic Field: Physics
Faculty Advisor: Dr. Luis Cruz Email: lrc42@drexel.edu

Wavelet transform method to characterize dendrites in digital images of brain tissue

Author(s): Frank Jones

The effects of normal aging in the brain can be characterized by mild impairments in memory and executive function. These impairments usually start developing in healthy people in their early twenties and progress linearly until old age. This is usually labeled as the "normal" effects of age. The precise nature of these effects in the brain, however, is not known. Extensive studies have shown that neurons are not lost in normal age, in contrast with neurodegenerative diseases such as Alzheimer's disease. In a previous joint computational and anatomical study, it was found that the arrangement of neurons in aged brains was less organized compared to that of young brains. This meant that neurons that are typically organized in anatomical structures known as microcolumns, became less columnar due to random small displacements of their positions. Previous work has shown

that dendritic arbors undergo age-related changes in area 46. The current hypothesis is that these spatial changes in dendritic arbors contribute to small random displacements of the surrounding cortical tissue, and therefore lead to small disruptions in neuron position and microcolumn arrangement. In this work we present a method to assess this atrophy from digital immunostained photomicrographs of brain tissue samples. By applying a wavelet transform to digital images of brain tissue we characterize the widths and separation of bundles of dendrites. By correlating these quantities with age, we determine if they contribute to the anatomical changes found in neuron arrangement and cognitive impairment.

Location: Row - D; Number - 33 Judging Time: 11:00a.m. - 12:30p.m.

Presenter(s): Vishal Kasliwal Email: vpk24@drexel.edu
Major: Physics Academic Field: Physics
Faculty Advisor: Michael S. Vogeley Email: vogeley@drexel.edu

Variability of Active Galactic Nuclei in SDSS Stripe82 & Kepler

Author(s): Vishal Kasliwal

We study the flux variability properties of Active Galactic Nuclei (AGN) in Stripe82 of the Sloan Digital Sky Survey (SDSS) and in NASA's Kepler mission. AGN are known to exhibit significant flux variability on timescales of hours, days, months and years. The physical origin of the variability is poorly understood. We seek to impose constraints on models for AGN variability by probing the stochastic properties of the flux time series. We use data from the Stripe82 region of the SDSS survey that has been imaged ~ 65 times over the ten year span of the SDSS survey yielding valuable long term time-series data on quasars. We also use the extremely high cadence NASA Kepler dataset which has been imaging quasars in the Kepler field once every 30 minutes since 2009 to probe the variability properties of quasars at extremely short timescales.

Location: Row - J; Number - 88 Judging Time: 11:00a.m. - 12:30p.m.

Presenter(s): Sam Kennerly Email: stk29@drexel.edu
Major: Physics Academic Field: Physics
Faculty Advisor: Robert Gilmore Email: robert.gilmore@drexel.edu

Illusory Decoherence

Author(s): Sam Kennerly

If a quantum experiment includes random processes, then the results of repeated measurements can appear consistent with irreversible decoherence even if the system's evolution prior to measurement was reversible and unitary. Two thought experiments are constructed as examples.

Location: Row - K; Number - 101 Judging Time: 12:30p.m. - 2:00 p.m.

Presenter(s): Mitra Khaksari Email: mek352@drexel.edu
Major: Clinical Psychology Academic Field: Psychology
Faculty Advisor: Pamela Geller, Ph. D. Email: pg27@drexel.edu

Infertility among Cultural and Ethnic Minorities

Author(s): Mitra Khaksari

Infertility is defined by the Centers for Disease Control and Prevention (CDC) as the inability to become or stay pregnant following a year of unprotected intercourse, or six months if a woman is older than 35. It affects approximately 10%, or 6.1 million women in the United States (CDC, 2011). African American, Hispanic, and other non-Caucasian women report higher rates of infertility, according to the National Center for Health Statistics (NCHS, 1995). Primary infertility is the failure to conceive and carry to term a first biological child, while secondary infertility, which is more common, is the failure to conceive and carry to term any additional pregnancies. Approximately one third of infertility issues result from female factor infertility, one third from male factor infertility, and one third from mixed or unknown causes (CDC, 2011). Treatment for infertility is widespread and includes surgical, medical, or psychological options. Medical treatments of infertility include drug therapy, artificial insemination, and assisted reproductive technologies (ART), with in vitro fertilization (IVF) being the most common type of ART. Women of ethnic minorities, particularly Hispanic and African American women are less likely to receive ART and wait longer before seeking treatment. There exist real differences in access to and use of infertility treatment by ethnic and cultural minorities in the US. This poster will review the extant literature on infertility treatment, its availability and usage by minority women in the US, and outcomes following infertility treatment.

Location: Row - C; Number - 22 Judging Time: 12:30p.m. - 2:00 p.m.

Presenter(s): Kimberly Kilgore Email: kmk96@drexel.edu
Major: Mathematics Academic Field: Mathematics
Faculty Advisor: Shari Moskow Email: moskow@math.drexel.edu

Inverse Born Series for Diffuse and Propagating Waves

Author(s): Kimberly Kilgore

In mathematics, an inverse problem generally refers to a problem formulation in which observed data is used to solve for unknown parameters within a system or object. This poster is concerned with the study of the inverse scattering problems for both diffuse and propagating waves. These problems consist of using boundary measurements to recover the values of the absorption coefficient and refractive index, respectively, within the domain. Recovery of the absorption coefficient can be used to discover an object, such as a cancerous mass surrounded by normal tissue, in the field of biomedical imaging. In turn, the recovery of the refractive index might be used in applications like nondestructive testing, where an image of the internal condition of an object can be obtained when normal testing might prove too invasive. These values can be found through inversion of the Born series. We will present results on the convergence of the inverse Born series, and considering a radially symmetric medium, we will then summarize and compare numerical simulations for both the diffuse and propagating cases in two and three dimensions.

Location: Row - H; Number - 67 Judging Time: 11:00a.m. - 12:30p.m.

Presenter(s): William King Email: wking@drexel.edu
Major: Physics Academic Field: Physics
Faculty Advisor: Luis Cruz Cruz Email: ccruz@physics.drexel.edu

Thermally calibrating AFM cantilever spring constants

Author(s): William King

In order to successfully function in the world, your body must be capable of generating and responding to a number of mechanical stresses, and it has developed many dedicated structures that can be used for such purposes. The muscle protein titin is a key player in providing passive elasticity in skeletal muscle, acting as a molecular spring holding the sarcomere together. Because it's biologic role involves its response to mechanical force, we use an atomic force microscope to apply similar forces to titin subdomains in vitro. A better understanding of their response of mechanical strain would help us understand titin's effect within a cell, and also shed light on the broader issue of protein folding and stability. In order to conduct such experiments, we need calibration methods with which we can easily and accurately measure the spring constants of our AFM cantilevers. I will discuss the most popular "thermal tune" method, which takes advantage of the equipartition theorem from statistical mechanics to calculate the spring constant from the cantilever's thermal fluctuation. One of the main benefits of this approach is its accessibility, since it does not require external weights or reference springs. While the basic theory is reasonably accurate, there are many refinements that allow for a more

reliable estimation. I will point out some of these refinements in the context of my 'calibcant' software package that implements the calibration scheme for Linux-controlled microscopes.

Location: Row - B; Number - 10 Judging Time: 11:00a.m. - 12:30p.m.

Presenter(s): Rachael Kratzer Email: rmk55@drexel.edu
Major: Physics Academic Field: Physics
Faculty Advisor: Gordon Richards Email: gtr@physics.drexel.edu

Using Radio Non-Detections to Determine the Relationship between Radio Loudness of AGN and their Fundamental Parameters

Author(s): Rachael Kratzer

While it is debated as to whether a dichotomy between radio-loud and radio-quiet quasars actually exists, the fact remains that some quasars are radio-loud while others are not. Using stacking analysis of radio-quiet optically-confirmed SDSS quasars (undetected by FIRST), we search for trends in radio properties as a function of redshift and luminosity in an attempt to isolate the "parent sample" of radio-loud quasars. We further explore trends in radio properties as a function of two parameters of the CIV emission line (the equivalent width and the "blueshift"), which are correlated with the ionizing spectrum. The CIV emission line parameter space affords a unique way to probe the radio properties of undetected quasars: we predict that radio-quiet quasars at opposites extremes in their ionizing spectra will have very different median stacked radio properties. We further break our sample into smaller subsets (e.g., based on optical luminosity) to explore the radio-dependence on these parameters. Stacking subsets of quasars undetected by FIRST offers a fresh new insight to a frustratingly stagnant problem.

Location: Row - M; Number - 115 Judging Time: 11:00a.m. - 12:30p.m.

Presenter(s): Coleman Krawczyk Email: cmk82@drexel.edu
Major: Physics Academic Field: Physics
Faculty Advisor: Gordon Richards Email: gtr@einstein.physics.drexel.edu

Mean SEDs and Bolometric Corrections for Luminous Quasars

Author(s): Coleman Krawczyk, Gordon Richards

We explore the spectral energy distributions (SEDs) for 121,988 luminous quasars using mid-IR data from Spitzer and WISE, near-IR data from 2MASS and UKIDSS, optical data

from SDSS, and UV data from GALEX. In addition to computing a mean SED, our work concentrates on how the mean SED changes as a function of various parameters. As such, we consider the problem of determining bolometric corrections for individual quasars as opposed to the ensemble average. While normally bolometric corrections are fixed to a single SED, we find a range of values.

Location: Row - H; Number - 72 Judging Time: 12:30p.m. - 2:00 p.m.

Presenter(s): Joseph Lambert Email: jgl29@drexel.edu
Major: Physics Academic Field: Physics
Faculty Advisor: Roberto Ramos Email: robertoramos99@gmail.com

Fabrication of Graphene-based Josephson Junctions for Studying Gate-Voltage Controlled Macroscopic Quantum Effects

Author(s): Joseph Lambert, Steven Carabello, Roberto Ramos

Graphene is a fascinating material with many promising applications and rich physics. It is a 2-dimensional material consisting of a single atomic layer of carbon atoms arranged in a hexagonal lattice. We have produced single crystals of graphene tens of microns long exfoliated from graphite using adhesive tape. By depositing Al leads 100-300 nm apart onto these flakes, we have fabricated superconducting devices called Josephson junctions. Below the superconducting critical temperature of Al (~1K), the graphene provides a weak link between the superconducting Al leads. As a result, a resistance-less supercurrent is observed to pass through the graphene, between the leads. Above a characteristic critical current, the devices switch from the superconducting to the normal resistive state. The novelty of graphene-based Josephson junctions is a back gate voltage, which we can use to tune the junction's critical current. This provides an additional macroscopic classical knob to control quantum-mechanical properties of the junction. From the stochastic distribution of currents at which these devices switch to the normal state (the switching current), we can perform many interesting experiments, such as microwave resonant activation, macroscopic quantum tunneling, and energy level quantization, which are all tunable by the gate voltage [1]. We report on the fabrication of these devices and progress toward measuring and understanding the distribution of the switching current from these experiments.
[1] J. G. Lambert, et al., IEEE Trans. in Appl. Supercond. 21, 734 (2011).

Location: Row - H; Number - 69 Judging Time: 11:00a.m. - 12:30p.m.

Presenter(s): Lori Lester Email: lal56@drexel.edu
Major: Environmental Science Academic Field: Environmental Science

Faculty Advisor: Harold W. Avery Email: haltort@aol.com

Underwater Anthropogenic Sounds in an Estuarine Diamondback Terrapin Habitat

Author(s): Lori Lester, Wendy E. Dow Piniak, Craig A. Harms, Harold W. Avery

Anthropogenic sounds are increasing in many estuarine environments where recreational boats produce much of this noise. Sound detection is essential for many aquatic organisms as it allows them to communicate, find mates, locate prey, navigate, or avoid predators. As anthropogenic sounds increase in many habitats, a clearer understanding of how animals are affected by human-generated sounds is necessary. In this study, we aimed to determine if the diamondback terrapin (Malaclemys terrapin) hearing range overlaps with anthropogenic sounds produced by recreational motor boats. We recorded auditory evoked potential (AEP) responses in terrapins (n=5) to determine underwater hearing capability. AEPs are produced when neurons in the auditory pathway are discharged simultaneously in response to an acoustic stimulus. We also measured anthropogenic sound pressure levels (SPLs) in Barnegat Bay, New Jersey, USA at various locations and times of year. Female terrapins responded to underwater sounds from 50 to 800 Hz, with the range of best hearing from 200 to 300 Hz. Anthropogenic sound recordings contained low-frequency sounds at SPLs that are within the terrapin hearing range. Future research should focus on whether terrapins and other estuarine organisms behaviorally and physiologically respond to anthropogenic sounds.

Location: Row - M; Number - 118 Judging Time: 12:30p.m. - 2:00 p.m.

Presenter(s): Runcong Liu Email: rl83@drexel.edu
Major: Physics Academic Field: Physics
Faculty Advisor: Brigita Urbanc Email: brigita@physics.drexel.edu

Investigation of the interaction between CTCF and DNA using AFM imaging

Author(s): Runcong Liu

CTCF is a highly conserved zinc finger protein found in all eukaryotic cells. It has been implicated in many aspects of gene regulation and nuclear organization. Recent studies show that in the presence of CTCF, DNA forms unusual DNA structures. These unusual structures were hypothesized to correspond to loop conformations. These loop conformations may play a critical role in various gene regulation functions but have not been observed directly so far. We use atomic force microscopy to capture the CTCF-DNA complex conformations, and observe loop-like DNA structures. We study the role of specific versus non-specific DNA binding sites in DNA loop formation and demonstrate that zinc fingers of CTCF are critically involved in DNA binding. These results serve as direct evidence of CTCF-induced DNA loop conformations that may help elucidate the mechanism

of the CTCF function in transcription regulation.

Location: Row - J; Number - 82 Judging Time: 12:30p.m. - 2:00 p.m.

Presenter(s): Xiang Liu Email: XL64@DREXEL.EDU
Major: Chemistry Academic Field: Chemistry
Faculty Advisor: Karl Sohlberg Email: kws24@drexel.edu

First-principle calculations for NaTaO3 surfaces

Author(s): Xiang Liu

Sodium tantalate has shown a high catalyzing efficiency in the photodisocciation reaction of water. We are interested in investigating the surface structure of NaTaO3 because the surface is where the catalyzing reaction occurs. First-principle (DFT) calculations are performed in this work to calculate the electronic total energy of the different Miller surfaces of the NaTaO3 crystal in order to identify the most stable surface of NaTaO3. In this presentation, I will describe (1) different ways to calculate symmetrical and asymmetrical surfaces of the crystal; (2) the surface reconstructions found from these calculations.

Location: Row - L; Number - 107 Judging Time: 12:30p.m. - 2:00 p.m.

Presenter(s): James Malazita Email: jwm462@drexel.edu
Major: Communication, Culture, and Media Academic Field: Communication
Faculty Advisor: Doug Porpora Email: porporad@drexel.edu

Framing Gaming: The Gamer's Role in the Creation of Morality in Video Games

Author(s): James Malazita, Alex Jenkins

It has long been assumed that video games, particularly those with extensive narratives and choice-based gameplay, create an environment for players to explore moral themes and decision-making. Increasingly, developers and advertisers have begun touting the ethical weight of games as key creative and financial aspects of modern game design. As such, it becomes ever more important to evaluate the roles undertaken by the players themselves within these systems. Scholars such as Miguel Sicart (2009) have used an Aristotelian model of ethics—one that presumes a moral subject—to describe the relationships between players and ethics-based gameplay. However, as Kwame Appiah (2008) suggests, one cannot assume a universal construction of moral situations; rather, much of the heavy lifting in moral decision making is created by the determination of

whether or not the situation is, in fact, moral. Following this line of thought, we seek to analyze the moral and prudential frames constructed within videogames by players and media. Using a mixed-methodology, this research employs discourse analysis of certain paratextual (Consalvo, 2007) aspects of digital games, specifically online game reviews, articles and the comments sections that accompany these texts, as well as a case analysis of possible moral narratives and mechanics present within video games. By examining reactions to and discussions of games like Activision's Call of Duty: Modern Warfare 2 and Bioware's Star Wars: Knights of the Old Republic, we hope to show that even given the push by developers to include ethics-based storytelling and gameplay, the ultimate framing of the text rests in the hands of the player.

Location: Row - N; Number - 124 Judging Time: 11:00a.m. - 12:30p.m.

Presenter(s): Jared McCaskie Email: jsc84@drexel.edu
Major: Neuroscience Academic Field: Biological Sciences
Faculty Advisor: Felice Elefant Email: felice.elefant@gmail.com

Potential Tip60-RNA interaction in synaptic plasticity

Author(s): Jared McCaskie

Tat-interactive protein-60 kDa (Tip60) is a histone acetyltransferase (HAT) enzyme that belongs to the Royal family of proteins which include heterochromatin protein 1/ chromobox (HP1/CBX) and chromodomain helicase-DNA-binding (CHD) subfamilies. Like HP1/CBX and CHD proteins, Tip60 contains a conserved chromodomain (CD). The Tip60 CD binds specific methylated lysine residues on the histone tails in chromatin to epigenetically regulate gene transcription. Intriguigly, the CD of HP1a was shown to associate with RNA transcripts, supporting a role for the CD in binding RNA to regulate its function. Work from our laboratory demonstrates that in addition to its nuclear compartmentalization, Tip60 is also localized both pre- and postsynaptically in the Drosophila neuromuscular junction (NMJ) where it regulates synaptic bouton growth and function at least in part, via regulation of the synaptic microtubule cytoplasmic cytoskeleton. However, a direct cyptoplasmic role for Tip60 in neuronal function remains unclear. Given the influence of cytoplasmic RNA localization and translation on synaptic plasticity, here we ask whether the Tip60 CD associates with subcellular RNA to influence bouton function. To address this question, we are carrying out immunohistochemistry analysis to assess whether Tip60 colocalizes with translational machinery at the NMJ. Additionally, we are creating novel transgenic flies to specifically disrupt Tip60 CD function at the NMJ to assess whether RNA localization and/or regulation is affected. Finally, we will carry out Tip60 RNA immunoprecipitations to identify potential synaptic target RNAs. These studies will guide our future exploration of the functional significance of such potential Tip60-RNA interactions in synaptic plasticity.

Location: Row - C; Number - 20 Judging Time: 12:30p.m. - 2:00 p.m.

Presenter(s): Patrick McLaughlin Email: pjm79@drexel.edu
Major: Environmental Science Academic Field: Biological Sciences,
Faculty Advisor: Dr. Gail W. Hearn Environmental Science
Email: gwh26@drexel.edu

West African Amphibian Hotspot: Discovery and Conservation of New Species on Bioko Island, Equatorial Guinea

Author(s): Patrick McLaughlin

In comparison to species in North and South America and Southeast Asia, African amphibian species are poorly studied. Biodiversity hotspots known to harbor high diversity include regions of West Africa in the Guinean Forests and Cameroon Volcanic Line. Bioko Island lies 32 km off the coast of Cameroon, separated from these regions of intense biodiversity for the past 12,000 years. Bioko's pristine tropical forests, high annual rainfall, and varied topography provides ideal amphibian habitat. Past estimates of high amphibian diversity on Bioko have proven to hold true, as suggested by the results of this comprehensive 3-year inventory. The goals of this ongoing study are: collect and catalogue species across the island, identify landscape features that may contribute to gradients in species richness, sample for the deadly amphibian disease chytridiomycosis, and identify potential threats to vital habitat and populations. Results thus far have revealed 4+ new species, the presence of two endangered species thought to be restricted to the mainland, and an overall diversity that includes over 35 species across 8 different families. Results also confirm chytridiomycosis is present despite no apparent mass die-offs, suggesting resistance in Bioko species. Future genetic analysis of at-risk populations, combined with known threats, will enable a full assessment of Bioko's most threatened species and development of specific conservation action plans. This study has revealed that Bioko harbors many rare and endangered species from the mainland, along with a host of its own endemics, making it something of an amphibian ark for conservation in West Africa.

Location: Row - M; Number - 121 Judging Time: 12:30p.m. - 2:00 p.m.

Presenter(s): Derya Meral Email: dm559@drexel.edu
Major: Physics Academic Field: Physics
Faculty Advisor: Brigita Urbanc Email: brigita@physics.drexel.edu

Early Assembly Events of N-terminally Truncated Forms of Amyloid b-Protein

Author(s): Derya Meral

Alzheimer's disease (AD) is a leading cause of dementia in the elderly. Substantial evidence links the onset of AD pathology to amyloid b-protein (Ab) association into low molecular weight assemblies, called oligomers. The two predominant alloforms are 40- and 42-residue long Ab(1-40) and Ab(1-42), of which the latter aggregates faster and forms more toxic assemblies. Recently, the N-terminally truncated forms of Ab, which can also be found in the AD brain, were reported to be even more toxic than Ab(1-42). Here, we use an efficient discrete molecular dynamics approach to study oligomer formation of Ab(3-40), Ab(3-42), Ab(11-40) and Ab(11-42) and analyze the structure of the resulting assemblies. Our results demonstrate an increased solvent exposure of the N-terminal region of these N-terminally truncated peptides relative to their full-length peptides. These results provide insights into structural elements associated with Ab toxicity and are of relevance to development of new therapeutic approaches.

Location: Row - I; Number - 75 Judging Time: 12:30p.m. - 2:00 p.m.

Presenter(s): Crystal Moorman Email: cmm436@drexel.edu
Major: Physics Academic Field: Physics
Faculty Advisor: Michael Vogeley Email: vogeley@drexel.edu

The Impact of Environment on the Faint-End Slope of the HI Mass Function

Author(s): Crystal Moorman

Large surveys like the Sloan Digital Sky Survey (SDSS) have shown that the Universe has structure that is popularly described as the “cosmic web.” Large, under-dense regions of space, known as voids, separate galaxy clusters that are connected by thin filaments and sheets of galaxies. Cluster galaxies are known to interact with each other via collisions that significantly change the future evolution of the galaxy. Voids are pristine environments for determining the accuracy of galaxy evolution models in the absence of interactions. We study how environment affects star formation and galaxy evolution in the Universe by comparing galaxies in clusters and voids. We use the SDSS and the Arecibo Legacy Fast ALFA (ALFALFA) Survey with a peculiar velocity flow model to define void regions, determine stellar and neutral hydrogen (HI) masses of galaxies, and thus determine the HI Mass Function (HIMF). To determine star formation efficiency, we calculate the gas mass fraction of galaxies, which is the ratio of the mass of neutral hydrogen (HI) to stellar mass. The HIMF and gas mass fraction are used to compare star formation and galaxy evolution of void vs. non-void galaxies.

Location: Row - C; Number - 21 Judging Time: 11:00a.m. - 12:30p.m.

Presenter(s): Noga Neeman
Major: Biological Sciences
Faculty Advisor: Dr. Michael P. O'Connor

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Academic Field: Biological Sciences, Environmental Science
Email: oconnomp@drexel.edu

Do leatherback turtles shift their nesting seasons as a response to changes in sea surface temperature?

Author(s): Noga Neeman, Michael P. O'Connor, James R. Spotila

Since modern species of sea turtles arose 180-150 million years ago, it is clear that they have survived past shifts in climate, presumably by altering migratory routes, redistributing breeding and foraging sites, and adjusting physiological parameters. However, current rates of increase in atmospheric greenhouse gases and associated temperature changes are very rapid and it remains unclear whether or not sea turtles, compromised by their long generation times, will be able to adapt to new conditions. If they do so, it may be through modification of their nesting; either by moving to new beaches or by shifting their nesting season. The aim of this study is to determine whether the leatherback population nesting at Tortuguero (Costa Rica) is shifting its nesting season in response to changing sea surface temperatures. Correlations were made between sea surface temperatures both at nesting and foraging sites (Eastern and Western North Atlantic and the Gulf of Mexico) and Julian date percentiles (10th, 25th and 50th) of nesting. The temperature at the nesting site did not have an effect on nesting dates. However, higher January temperatures in the Gulf of Mexico (when migrations would start) and lower annual minimum temperatures in the Western North Atlantic both led to earlier nesting. It is thought that these contradictory effects of temperature reflect underlying responses of productivity to temperature, with warmer years leading to increased productivity in Gulf of Mexico and colder years doing so in the Western North Atlantic. More productive years would mean that leatherbacks can accumulate enough energy stores to start their nesting migrations earlier in the year. Future work includes looking at primary productivity data in both areas to confirm temperature effects, as well as studying the future effects of the changing nesting season on hatching success.

Location: Row - E; Number - 45

Judging Time: 11:00a.m. - 12:30p.m.

Presenter(s): Amanda NeMoyer
Major: Psychology and Law
Faculty Advisor: Naomi Goldstein

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Juvenile Competence to be Sentenced to Probation: A Relevant Legal Standard?

Author(s): Amanda NeMoyer, Ana Prelic, Jenna Ebbecke, Holly Hinz, Naomi E.S. Goldstein

Probation is the most common disposition for delinquent youths, but there is no competence standard for juveniles facing that disposition. Deficiencies in other legal decision-making abilities suggest that many juveniles may not adequately understand probation requirements and appreciate the consequences of fulfilling those requirements; as a result, they may violate probation. Applying a more specific competency standard could help ensure juveniles on probation understand conditions with which they must comply. However, concerns arise regarding alternatives for those juveniles who would not meet minimum probation competency levels. This poster discusses creating a juvenile probation competency standard and resolutions to resulting concerns.

Location: Row - D; Number - 31 Judging Time: 11:00a.m. - 12:30p.m.

Presenter(s): Alison Novak Email: ann37@drexel.edu
Major: Culture & Communication Academic Field: Communication
Faculty Advisor: Ernest A. Hakanen Email: eah22@drexel.edu

Mather Work Incentive Posters and the Rhetoric of Scientific Management in the 1920s

Author(s): Alison Novak, Ernest A. Hakanen

The Charles Mather work incentive posters of the 1920's promoted the philosophy of scientific management that just ten years earlier U.S. Congress deemed reductionist and dehumanizing. In a time where the rise of middle management and the growing faith in the powers of capitalism were omnipresent, the posters and rhetoric of scientific management made great sense to those in control of big business. Mather's 78 work posters hung in offices and factories all over the country, and describe what it meant to be efficient, productive, and a good member of business society in the 1920s. As a medium, Mather's posters served to create and reinforce workplace practices of managers and leaders that would advance 1920s corporation and society. As propaganda, the posters appealed to worker's attitudes, behaviors, emotions, and sense of social belonging.
This study evaluates the rhetoric and themes of Mather's 71 posters in the 1926/27 catalogue (the most popular year for the posters). It finds that in a propaganda-like manner, the posters encourage and discourage workplace behaviors that support management at the expense of workers' thoughts and self-protection in the form of unionism.
Evaluation of these posters lends insight into the history of motivational posters and signs within organizational culture. Today, newer motivational posters are hung in offices around the world, with intentions similar to Mather. Because Mather's posters signify the beginning of motivational posters in the modern western organization, studying the originals can help describe transitions in corporate culture.

Location: Row - N; Number - 126 Judging Time: 11:00a.m. - 12:30p.m.

Presenter(s): Allyson O'Brien Email: amo45@drexel.edu
Major: Physics Academic Field: Physics
Faculty Advisor: Dr. Robert Gilmore Email: robert.gilmore@drexel.edu

Quantum Physics and the Finite Element Method

Author(s): Allyson O'Brien

The finite element method (FEM) is used to compute approximate numerical solutions to partial differential equations. Although it is widely used in other fields, FEM is not utilized in the field of quantum mechanics. The Schrödinger equation describes quantum states of physical systems. Using the FEM, we can numerically approximate solutions to the Schrödinger equation for systems that are difficult to describe in conventional coordinates.

Location: Row - G; Number - 61 Judging Time: 12:30p.m. - 2:00 p.m.

Presenter(s): Jacob Owens Email: jro35@drexel.edu
Major: Environmental Science Academic Field: Environmental Science
Faculty Advisor: Gail Hearn Email: gwh26@drexel.edu

Dietary plasticity of the Bioko Island drill (Mandrillus leucophaeus poensis)

Author(s): Jacob Owens, Gail Hearn, Shaya Honarvar

Despite once ranging across Equatorial Guinea's Bioko Island, drill monkeys (Mandrillus leucophaeus poensis) are now limited by intense bushmeat market hunting to the Gran Caldera and Southern Highlands Scientific Reserve, a nominally protected area that comprises the southern third of the island (550 km2). Even within this limited area, drills can be found at elevations ranging from sea level to more than 2200m asl and in corresponding habitats ranging from the monsoon forests of the coast to the montane forests of the Gran Caldera. Utilizing the inherent resource variations between these different habitats, we investigated the diets of un-habituated drill groups at higher (montane forest, 900-1100m asl) and lower (monsoon forest, 0-300m asl) altitudes to determine the impact of spatial variations in resource availability on drill feeding strategies. During three consecutive dry seasons (January-March, 2010–2012) we obtained dietary data through opportunistic feeding observations and the collection and analysis of fecal samples. The principal dietary component differed significantly with altitude: Low altitude drills ate significantly more fruit (95% mean dry weight of fecal remains) while high altitude drills ate significantly more non-fruit fiber (66.7% mean dry weight). These

diverse feeding strategies have implications for group size, social behavior and future conservation efforts for this endangered species.

Location: Row - A; Number - 3 Judging Time: 11:00a.m. - 12:30p.m.

Presenter(s): Daniel Parry Email: dan.t.parry@gmail.com
Major: Mathematics Academic Field: Mathematics
Faculty Advisor: Robert Boyer Email:

On The Zeros of The Plane Partition Polynomials

Author(s): Daniel Parry

Location: Row - I; Number - 77 Judging Time: 12:30p.m. - 2:00 p.m.

Presenter(s): Samir Patel Email: shp42@drexel.edu
Major: Environmental Science Academic Field: Environmental Science
Faculty Advisor: Jim Spotila Email: spotiljr@drexel.edu

Post-Reproductive Migration of an Adult Male Loggerhead From Crete Revealed By Satellite Telemetry

Author(s): Samir Patel, Aliki Panagopoulou, Stephen Morreale, Frank Paladino, Dimitris Margaritoulis, James Spotila

During the late spring of 2011, we acquired a small male loggerhead off the coast of Rethymno through collaboration with a local fisherman. We attached a satellite transmitter to this individual and tracked it to determine its post-reproductive migratory and foraging behaviors. This turtle embarked on its post-reproductive migration well in advance of the end of the nesting season. It first travelled approximately 1200 km to the Gulf of Gabes, Tunisia, residing there for over a month before continuing through the Strait of Sicily approximately 1000 km into the western Mediterranean Sea. Unlike female post-nesting migrations, this male seemed to forage throughout its journey. While in the Gulf of Gabes, this individual foraged within a localized area similar to its female counterparts; however, while travelling through the Mediterranean, a more nomadic foraging behavior was exhibited. Regardless of location, foraging seemed to occur within the benthic zone. The male was able to take much longer dives (>90 minutes) more regularly than what has been exhibited in the past by female loggerheads from Crete. This is also the furthest travelling satellite tracked turtle from Greece and the movement into the western Mediterranean is the first of its kind from a satellite tracked loggerhead originating in the eastern Mediterranean. This particular male behaved with far more individual variation than is

seen during female post-nesting and is indication that more research is required into the behavior of adult male loggerheads to truly understand how this species uses the entire Mediterranean Sea.

Location: Row - C; Number - 26 Judging Time: 12:30p.m. - 2:00 p.m.

Presenter(s): Steven Pearson Email: shp36@drexel.edu
Major: Environmental Science Academic Field: Environmental Science
Faculty Advisor: Harold Avery Email: haltort@aol.com

Competition between IUCN, near-threatened, red-bellied turtles (Pseudemys rubriventris) and invasive red-eared slider turtle (Trachemys scripta elegans)

Author(s): Steven Pearson, Harold W. Avery, PhD.

Invasive species affect populations and communities of wildlife worldwide through predation and competition for limited resources. Globally, the invasive red-eared slider turtle (Trachemys scripta elegans) may compete with native turtles for limited food, basking and other wetland resources. In the mid-Atlantic region of the United States, the red-eared slider turtle is ecologically similar to the red-bellied turtle (Pseudemys rubriventris). Red-bellied turtles have undergone population declines in wetlands where red-eared slider turtles have been introduced. In anthropogenically degraded wetlands the potential for competition may be greater between red-eared slider turtles and red-bellied turtles due to extensive overlap for dietary resources and habitat use. We performed manipulative experiments with juvenile turtles of both species to determine the underlying mechanisms of how red-eared slider turtles may compete with red-bellied turtles for limited resources. Using mesocosms, we housed single and mixed species groups at low and high densities to determine the mechanisms of competition for limited dietary and thermoregulatory resources. We determined ingestion rates, growth rates and behavioral interactions of turtles to determine whether red-eared slider turtles outcompete red-bellied turtles for limited dietary and thermoregulatory resources. Preliminary results indicate that the growth rate and ingestion rates of red-bellied turtles can be suppressed when housed with red-eared slider turtles under limited resource conditions. Understanding the mechanisms of competition between red-eared slider turtles and red-bellied turtles will allow us to understand the long term impacts of the red-eared slider turtle invasions on ecologically similar native species.

Location: Row - B; Number - 12 Judging Time: 11:00a.m. - 12:30p.m.

Presenter(s): Christina Peters Email: cmp346@drexel.edu
Major: Physics Academic Field: Physics

Faculty Advisor: Gordon T. Richards Email: gtr@physics.drexel.edu

Bayesian Quasar Selection Using Variability Properties

Author(s): Christina Peters, Gordon T. Richards

We used the Non-parametric Bayesian Classification Kernel Density Estimation (NBC KDE) quasar selection algorithm to compare the effectiveness of four different data sets of known quasars and stars to classify a set of unknown objects. Beginning with data from the Sloan Digital Sky Survey (SDSS) DR7 Quasar Catalog, multi epoch quasar sample, and the University of Washington Variable Object Catalog, we used the colors from the SDSS data and the variability parameters from the U.W. catalog to compute each object's probability of being a star or quasar. When doing self tests of the data sets we found an improvement in the percentage of quasars detected with using multi epoch data (97.54%) over single epoch data (95.34%) and an improvement in the number of quasars that are detected when using variability parameters in addition to colors (99.34%) over just colors (97.54%). Using a sample of stripe 82 multi epoch point sources we found 4829 of 4837 known quasars were classified to be quasars and 1113 previously unknown quasars were found. Of these, 962 are beyond the spectroscopic limit of i=19.1, and represent a significant gain over the existing selection algorithm by enabling deeper selection with the same data.

Location: Row - H; Number - 66 Judging Time: 12:30p.m. - 2:00 p.m.

Presenter(s): Sheila Pirooznia Email: keerthycv@gmail.com
Major: Biology Academic Field: Biological Sciences
Faculty Advisor: Felice Elefant Email: fee22@drexel.edu

Tip60 HAT activity modulates APP mediated effects on Drosophila small ventrolateral neurons and affects sleep-wake cycle

Author(s): Sheila Pirooznia, Kellie Chiu

Aberrant changes to the epigenetic modification code within the genome of the brain, specifically histone acetylation, cause gene misregulation that may contribute to the pathogenesis of memory related disorders like Alzheimer's disease (AD). Tip60 is a histone acetyltransferase (HAT) enzyme that forms a transcriptionally active complex with the AD associated amyloid precursor protein (APP) intracellular domain (AICD) that has been shown to epigenetically regulate certain genes relevant for the disease process via histone acetylation. However, whether misregulation of Tip60 HAT activity directly disrupts selective early neuronal processes affected by APP in vivo that contribute or lead to AD remains to be elucidated. Here, we investigate whether Tip60 HAT activity is required for APP mediated effects on axonal growth of the Drosophila small ventrolateral neurons

(sLNvs), a group of circadian pacemaker cells analogous to the mammalian suprachiasmatic nucleus master clock. The sLNvs have been shown to regulate sleep, a process disrupted early in AD patients. We show that Tip60 and APP functionally interact to selectively mediate both sLNv axonal arborization during neurogenesis and its production of the neuropeptide pigment dispersing factor (PDF) that functions as a modulator of sleep and wake in the fly. Loss of Tip60 HAT activity decreases PDF levels selectively in the sLNvs post developmentally, resulting in disruption of the sleep-wake cycle in the fly and these defects are exacerbated under APP expressing conditions. Remarkably, overexpression of Tip60 in conjunction with APP rescues the APP mediated defects in reducing PDF levels and disrupting sleep cycle. Importantly, all of these effects are dependent upon the C-terminal domain of APP that is required for forming a transcriptional regulatory complex with Tip60. Our results reveal a novel mechanism for PDF control via Tip60 and APP that regulates sleep-wake cycle and may provide insight into the utility of specific HAT activators as therapeutic strategies for early sleep disturbances observed in AD.

Location: Row - J; Number - 86 Judging Time: 11:00a.m. - 12:30p.m.

Presenter(s): Simara Price Email: sp564@drexel.edu
Major: Biology Academic Field: Biological Sciences
Faculty Advisor: Dr. Shivanthi Anandan Email: anandans@drexel.edu

Determining the Evolutionary History of a Putative Collagen Protein in Trichodesmium erythraeum

Author(s): Simara Price

Collagen is a structural protein that can function in basement membranes to allow for cell attachments. A collagen like gene was identified in the marine cyanobacterium Trichodesmium erythraeum. This predicted collagen protein gene has a high identity with collagen proteinss found in Homo sapiens, Mus musculus and Rattus norvegicus in addition to other multicellular eukaryotes. The predicted T. erythraeum protein encoded by this gene has as 45% identity with human type I collagen (NCBI). Collagen is generally found in multicellular organisms and as its functions is to provide structural integrity in these organisms multicellular structures. The current explanation for the presence of this collagen protein in a unicellular prokaryote put forward by Layton et al. is that it arose through a horizontal gene transfer from a multicellular eukaryote into T. erythraeum. The identity between multicellular eukaryotic collagens is usually >80% while the identity with T. erythraeum is ~45%. It is possible that T. erythraeum collagen is more closely related to an ancestral collagen and not the result of a horizontal gene transfer from a multicellular eukaryote into T. erythraeum. Using phylogenetic analysis, this study will determine the relationship between the predicted collagen protein of T. erythraeum Tery_0397 and known eukaryotic collagen proteins. Based on these analyses, we will also suggest a

function for this protein in T. erythraeum.

Location: Row - H; Number - 73 Judging Time: 11:00a.m. - 12:30p.m.

Presenter(s): Ryan Rebozo Email: rr467@drexel.edu
Major: Environmental Science Academic Field: Environmental Science
Faculty Advisor: Dr. Walter Bien Email: walter.f.bien@drexel.edu

The effects of land management practices on survivorship, fecundity, and the pollination system of Gentiana autumnalis in the New Jersey Pinelands

Author(s): Ryan Rebozo, Dr. Walter Bien

Gentiana autumnalis is a rare disturbance-dependent plant that is endemic to early successional pine barrens habitats in New Jersey. Several early-successional habitats are maintained by a fire return interval of 15 years or less. However, fire suppression now limits many early successional plants to roadsides that remain unburned and instead are mowed to reduce encroachment of vegetation onto roadways. The focus of this research is to examine the impact of land management practices on the ecology of G. autumnalis. We will classify populations of G. autumnalis by their density and areal size, density of co-flowering plants, and land management practice (burn, mow, hand shear, or disk). Demographic data will be recorded including survivorship, fecundity, and recruitment. These data will elucidate whether a given patch is increasing, decreasing, or is remaining stable in size over successive seasons. In addition, pollinator visitation rate, pollinator plant fidelity, and pollination success rate (seed set) will be measured to compare differences among patch densities and management land practices. Preliminary data suggests that G. autumnalis exists in a Diptera dominated pollination system where percentage of plants to set seed is highest in disturbed sites. Identifying which management practice facilitates maximum, survivorship and fecundity will be important for the conservation of Gentiana autumnalis.

Location: Row - D; Number - 37 Judging Time: 11:00a.m. - 12:30p.m.

Presenter(s): Scott Rome Email: romescott@gmail.com
Major: Mathematics Academic Field: Mathematics
Faculty Advisor: Shari Moskow Email: moskow@math.drexel.edu

Computing an Approximation to the Helmholtz Equation With a High Contrast Thin Scatterer Present

Author(s): Scott Rome

Computing solutions to partial differential equations numerically is computationally expensive. In particular, it is difficult to model large scale instances of scattering waves in three dimensions. Utilizing a method developed by Moskow et. al., we compute an approximation to the two dimensional Helmholtz equation using a one dimensional integral equation. This greatly reduces the required time to run a simulation, and can be generalized to higher dimensions.

Location: Row - L; Number - 110 Judging Time: 11:00a.m. - 12:30p.m.

Presenter(s): Jessica Sarthi Email: jbs64@drexel.edu
Major: Biological Sciences Academic Field: Biological Sciences
Faculty Advisor: Felice Elefant Email: fe22@drexel.edu

Tip60 HAT activity regulates synaptic plasticity: Implications for epigenetics in learning and memory

Author(s): Jessica Sarthi

Age-associated cognitive decline and neurodegenerative disorders such as Alzheimer's disease (AD) are associated with misregulation of synaptic plasticity linked genes; however the mechanisms underlying decline of such gene control during aging are unknown. Aberrant changes to histone acetylation patterns in the aging brain epigenome are linked to memory loss. It is therefore critical to identify and study the histone acetyltransferases (HAT) that create such marks. One promising candidate is Tip60, a HAT implicated in AD and shown by our laboratory to be critical in regulating neuronal processes linked to cognition (Genetics, 2007; PLoS ONE, 2010; PLoS ONE, 2011). Here we explore the consequences of misregulating Tip60 HAT activity in the Drosophila neuromuscular junction (NMJ). We show that the HAT dTip60 is concentrated both pre and post-synaptically within the NMJ. Presynaptic targeted reduction of dTip60 HAT activity significantly increases type Is synaptic bouton number while postsynaptic reduction results in significant loss of these boutons. The excess boutons show defects in neurotransmission function and rearrangement of microtubule loop architecture that is required for bouton division. Moreover, postsynaptic reduction of Tip60 HAT activity leads to misregulated organization of the postsynaptic marker disc large (DLG). Our results are the first to demonstrate a causative role for the HAT dTip60 in synaptic plasticity that is achieved by Tip60 mediated regulation of target genes such as Futsch that affect MT organization, GluRIIC and GluRIIB that affect synaptic transmission thus affecting bouton growth and function. These findings have implications for dTip60 HAT dependant epigenetic mechanisms underlying synaptic plasticity and cognitive function.

Location: Row - B; Number - 11 Judging Time: 12:30p.m. - 2:00 p.m.

Presenter(s): John Schreck
Email: jsschreck@gmail.com
Major: Physics
Academic Field: Physics
Faculty Advisor: Jian-Min Yuan
Email: yuanjm@drexel.edu

A statistical mechanical approach to protein aggregation

Author(s): John Schreck

We develop a theory of aggregation using statistical mechanical methods. An example of a com- plicated aggregation system with several levels of structures is peptide/protein self-assembly. The problem of protein aggregation is important for the understanding and treatment of neurodegenerative diseases and also for the development of bio-macromolecules as new materials. We write the effective Hamiltonian in terms of interaction energies between protein monomers, protein and sol- vent, as well as between protein filaments. The grand partition function can be expressed in terms of a Zimm-Bragg-like transfer matrix, which is calculated exactly and all thermodynamic proper- ties can be obtained. We start with two-state and three-state descriptions of protein monomers using Potts models that can be generalized to include q-states, for which the exactly solvable feature of the model remains. We focus on n × N lattice systems, corresponding to the ordered structures observed in some real fibrils. We have obtained results on nucleation processes and phase diagrams, in which a protein property such as the sheet content of aggregates is expressed as a function of the number of proteins on the lattice and inter-protein or interfacial interaction energies. We have applied our methods to Aβ(1-40) and Curli fibrils and obtained results in good agreement with experiments.

Location: Row - J; Number - 90
Judging Time: 11:00a.m. - 12:30p.m.

Presenter(s): Andrea Segal
Email: andrea.segal@drexel.edu
Major: Psychology
Academic Field: Psychology
Faculty Advisor: Christine Nezu, PhD, ABPP
Email: cmnezu@verizon.net

Problem Solving as a Mediator of Posttraumatic Growth in Heart Failure Patients

Author(s): Andrea Segal, Amy Evans, Erika Foster, Lauren Greenberg, Ben Hildebrand, Khushbu Patel, Sarah Ricelli, Kristin Salber, Christine Maguth Nezu, Arthur M. Nezu

Benefit finding, also referred to as “posttraumatic growth,” involves the phenomenon that some individuals, even after experiencing a chronic medical illness, can perceive some good emerging from the traumatic event (e.g., changes in oneself, changes in the relationships with others, and changes in one’s philosophy of life). Research has found benefit finding to be significantly related to an enhanced quality-of-life (QoL). The importance of focusing on

patients with heart failure (HF) involves the chronic nature of the condition, the lack of a cure, its negative prognosis, and its high mortality rate. The current study sought to determine (a) whether benefit finding is related to enhanced (QoL) among adults living with HF, and (b) to test the hypothesis that social problem solving (SPS) serves as a mediator between benefit finding and emotional well-being. Participants (N=162 adults; 38% women; mean age = 57.05) being treated for HF completed the HADS-D (measure of depression), the SPSI-R: Short Form (measure of social problem solving), the MLHFQ (QoL measure), and the PGI (measure of posttraumatic growth). Initial analyses showed PGI and MLHFQ scores were significantly related ($B = .36$, $p < .001$). To test the mediational effect of problem solving, the Sobel test was conducted for each of five SPSI-R dimensions. Results for the negative problem orientation and impulsive/carelessness dimensions were significant ($z = 2.26$, $p < .01$; $z = 3.17$, $p < .001$, respectively), which suggests the potential benefit of improving social problem solving (via Problem-Solving Therapy) to enhance QoL among individuals with HF.

Location: Row - M; Number - 114 Judging Time: 12:30p.m. - 2:00 p.m.

Presenter(s): Elizabeth Segelken Email: eks55@drexel.edu
Major: Physics Academic Field: Physics
Faculty Advisor: Luis Cruz Cruz Email: ccruz@drexel.edu

Lattice-Boltzmann Method for Studying the Dynamics of Polymer Solutions under Flow in Confining Geometries

Author(s): Elizabeth Segelken

The nature of the dynamics of polymers in a flow has important implications to problems ranging from flow of biomolecules to polymer processing. A direct understanding of this problem, however, is complicated by external factors such as flow under uneven surfaces and confining geometries. Here, we examine polymers in a solvent using a simple computer model. The model consists of a solvent, using the Lattice-Boltzmann method, with the addition of thermal fluctuations coupled to a bead-spring model for a polymer chain, with dynamics modeled by molecular dynamics, and coupled with a simple frictional force to the fluid. As such, the system will be driven by flow with stochastic forces. We are looking to explore the behavior of polymer chains when they are flowing through rough conduits and constrained by different geometries. More specifically, we will be looking at the diffusion coefficient and radius of gyration of the polymer in isolation and in a population of chains. Our results will be quantitatively compared to existing experiments and theory to check the accuracy of the model.

Location: Row - F; Number - 57 Judging Time: 12:30p.m. - 2:00 p.m.

Presenter(s): Xue Sha
Email: xs45@drexel.edu
Major: Chemistry
Academic Field: Chemistry
Faculty Advisor: Dr. Lynn Penn
Email: lsp28@drexel.edu

Stability and Reactivity of Epoxy Silane-Derivatized Inorganic Surfaces

Author(s): Xue Sha

Multi-step chemical modifications of silica surfaces are increasingly common. These often start with covalent coupling of organofunctional silane to the pristine surface, followed by subsequent steps based on the reactive organofunctional group of the silane. A study of the stability of silica surfaces derivatized with 3-glycidoxypropyl trimethoxysilane was carried out. This surface was found to degrade differently in acid and in base. Acid opens the epoxide ring, but leaves the siloxane bonds so the silica substrate intact. Base not only hydrolyzes the epoxide group but also hydrolytically cleaves the siloxane bonds to the silica substrate. The intact epoxide group was found to require elevated temperature for reaction with primary amines of any size. Finally, the original, pristine silica surface can be completely regenerated after surface modification by an oxidative treatment.

Location: Row - M; Number - 117
Judging Time: 11:00a.m. - 12:30p.m.

Presenter(s): Karl Siegert
Email: kgs36@drexel.edu
Major: Biology
Academic Field: Biological Sciences
Faculty Advisor: Shivanthi Anandan
Email: anandans@drexel.edu

A method for DNA Delivery to Synechococcus elongatus PCC 7942

Author(s): Karl Siegert

The introduction of plasmids expressing genes of interest into a bacterial cell can transform the cell to best fit your needs. Plasmids can encode selection markers as well as genes of interest, making them a powerful tool for bacterial manipulation. This use of genetic manipulation in bacteria has been widely characterized, is used widely in biotechnology and is of great importance when it comes to studying genes of interest. This expression of exogenous genes from a plasmid in a bacterial cell creates an experimental recombinant bacterial strain. The strategies for incorporating plasmids into a bacterial cell change as new and more efficient methods of plasmid delivery are innovated. We will discuss the use of electroporation as a method of plasmid delivery into the cyanobacterial species Synechococcus elongatus PCC 7942. This method opens up new doors for DNA delivery into S. elongatus and allows for the delivery of larger plasmid constructs into the S. elongatus cell. This, in turn, enhances for greater genetic manipulation of this bacterium for

experimental research purposes.

Karl Siegert and Dr. Shivanthi Anandan
Department of Biology, Drexel University

Location: Row - B; Number - 18 Judging Time: 11:00a.m. - 12:30p.m.

Presenter(s): Erica Smith Email: ess55@drexel.edu
Major: Physics Academic Field: Physics
Faculty Advisor: Jelena Maricic Email: jelena@physics.drexel.edu

Enhancing the Precision of Low Energy Neutrino Experiments with Novel Calibration Technique

Author(s): Erica Smith

The last mixing angle to be determined in the neutrino mixing matrix, which describes neutrino oscillations, is theta13. The Double Chooz experiment is looking to determine theta13 with only 0.6% systematic error, a vast improvement to the previous CHOOZ experiment which had a systematic error of 2.7%. One of the new developments being implemented to substantially improve precision of the experiment is the articulated arm, a device which allows for full-volume calibration of the detector. However, introduction of new equipment into the detector requires calibration in order to ensure optimal precision. A proposed solution is the optical finder, an LED which will be located on the articulated arm. By creating a cone of light at a known origin and then reconstructing the origin of the light based on detector readings, we can determine how precisely we are able to detect the location of light within the detector.

Location: Row - E; Number - 48 Judging Time: 12:30p.m. - 2:00 p.m.

Presenter(s): Micholas Smith Email: mds322@drexel.edu
Major: Physics Academic Field: Biological Sciences, Physics
Faculty Advisor: Luis Cruz Cruz Email: lrc42@drexel.edu

Influence of Ionic Salts in Aqueous Environments on the Folding of Dynamics of the 21-30 Amyloid Beta Fragment

Author(s): Micholas Smith, Luis Cruz Cruz

The central amyloid-β protein fragment 21-30 (Aβ 21-30) has been proposed as the folding

nucleus of the full-length Aβ widely implicated in Alzheimer's disease.? Our work explores the effects of dissolved ionic salts (NaCl, CaCl2, MgCl2, and KCl), common in the cellular environment, on the folding dynamics of this Aβ 21-30. Using long-time all-atom molecular dynamics, we measure the secondary structure fluctuations and lifetimes in the coil to beta secondary structure folding pathway and in the beta to turn/coil pathway. We find that while the beta to turn/coil pathway is largely uninterrupted, the overall stability of the coil to beta pathway is destablized.? This destabilization follows the trend Ca2+ > Mg2+ > Na+ > K+, where Ca2+ is the most destablizing. Our results re-iterate the stability of the beta secondary structure motif of this peptide fragment, and indicate that the folding landscape is rich in local minima.

Location: Row - F; Number - 56 Judging Time: 11:00a.m. - 12:30p.m.

Presenter(s): Andrew Smith Email: ahs55@drexel.edu
Major: Environmental Science Academic Field: Environmental Science
Faculty Advisor: Jacob Russell Email: jar337@drexel.edu

Environmental effects on pea aphids and their defensive bacterial symbionts

Author(s): Andrew Smith, Robert Tuttle, Steven Doll, Rachael Disciullio, Mickey Drott, Tyler Maruca

Symbioses range from antagonistic to mutualistic and are influenced by environmental factors such as temperature and parasites. Pea aphids, Acyrthosiphon pisum, host two facultative defensive bacterial endosymbionts that defend against natural enemies. Hamiltonella defensa, when in association with a bacteriophage, defends pea aphids against the parasitoid wasp, Aphidius ervi, and the efficacy of this protection is reduced under heat stress. Regiella insecticola reduces mortality and sporulation in pea aphids inoculated with the fungal pathogen Pandora neoaphidis. Temperature is an important factor in P. neoaphidis infection but how temperature affects R. insecticola mediated defense against P. neoaphidis has not been investigated. To date, studies confirming these relationships have been laboratory based and there is a need to understand how temperature and natural enemies influence symbiont frequency and aphid density in the field. The objective of this study was to correlate parasitism and infection rates with symbiont frequency, natural enemy density, host plant and within canopy temperature. Pea aphids, predators, parasitoids and temperature data were collected in alfalfa and clover fields periodically in southeastern Pennsylvania and the Finger Lakes Region of New York. Pea aphids collected in the field were screened for symbionts or reared in the laboratory to determine symbiont frequency and rates of parasitism and infection. Symbiont frequency, parasitism and infection rates varied seasonally, between locations and between host crops. To date, we have discovered a positive correlation between H. defensa frequency, alfalfa and parasitism rate and between R. insecticola and clover.

Location: Row - K; Number - 95 Judging Time: 12:30p.m. - 2:00 p.m.

Presenter(s): Kevin Smith Email: kps43@drexel.edu
Major: Environmental Science Academic Field: Environmental Science
Faculty Advisor: Walter F. Bien Email: wbien205@comcast.net

The nesting and neonate ecology of Pituophis melanoleucus.

Author(s): Kevin Smith, Walter F. Bien

The northern pine snake, Pituophis melanoleucus, is a state threatened species native to the New Jersey Pine Barrens. Development and habitat loss have caused the population to decline in recent years. Management of nests in jeopardy may involve translocation to artificial nests, though much of the ecology involving nesting and early life stages of the northern pine snake is unknown. In order to develop mitigation procedures, this research will investigate biophysical nesting requirements, neonate emergence behavior, and neonate microhabitat usage. We will characterize pine snake nest structure, analyze nest substrate texture, and measure substrate shear strength. Abiotic variables, such as temperature, soil water content, and gas concentrations (O2/CO2) will be measured throughout the incubation period until hatching. After emergence, neonate movement patterns will be recorded using a camera monitoring system to elucidate dispersal pathways and potential use of scent trailing. Neonates will be radio-tracked until fall ingress to determine the distanced traveled from nests, habitat use, and hibernacula site selection. These data will be important for understanding the biophysical requirements of hatchlings and assessing physical constraints on survivorship. We monitored two successful nests sites producing a total of 28 hatchlings, emerging in September 2011. Preliminary video data shows emerging neonates (n=3) dispersing in the same initial direction, potentially displaying scent trailing behaviors, though pathways later diverged. A better understanding of nesting and neonate ecology will be important for the conservation of the species and developing mitigation protocols that require translocating pine snake eggs to artificial nest sites.

Location: Row - N; Number - 130 Judging Time: 11:00a.m. - 12:30p.m.

Presenter(s): Marilyn Sobel Email: mcs57@drexel.edu
Major: Environmental Science Academic Field: Environmental Science
Faculty Advisor: Dr. Walter Bien Email: wfb22@drexel.edu

Seasonal Resource Allocation in the Federally-Threatened Endemic Plant Species Rhynchospora knieskernii (Cyperaceae)

Author(s): Marilyn Sobel, Dennis M. Gray, James R. Spotila, Walter F. Bien

Plants in nutrient-poor habitats may use differential allocation patterns throughout the growing season which may result in trade-offs between growth, defense, reproduction, and storage. The New Jersey Pine Barrens is characterized by sandy, acidic soils and sclerophyllous vegetation with limited availability of nitrogen and phosphorus. Rhynchospora knieskernii is a short-lived perennial sedge that is endemic to moist soils in the New Jersey Pine Barrens. We sought to determine the nature of R. knieskernii allocation strategies under field conditions of low nutrient availability. We collected soil samples from seven sites in August and November 2011. We collected plant samples from five sites during flowering (August), fruiting (October), and senescence (November). Plants were divided into reproductive structures, stems/leaves, and roots/winter bud. Soil samples showed little difference in nitrogen (N) concentrations between August and November, but much higher phosphorus (P) concentrations in November. Concentrations of total N and P in plants declined from flowering to senescence, but allocation of N to roots increased over time. The percentage of P allocated to reproductive structures was high throughout the season and appeared to increase as plants senesced. The conservation of nitrogen rather than phosphorus is consistent with a N-limited system. Further study of resource allocation patterns after fire may offer additional information.

Location: Row - J; Number - 91 Judging Time: 12:30p.m. - 2:00 p.m.

Presenter(s): Preeti Sunderaraman Email: preetis.ps@gmail.com
Major: Clinical Psychology Academic Field: Psychology
Faculty Advisor: Maria Schultheis, Ph.D Email: schultheis@drexel.edu

Preliminary exploration of changes in neuropsychological performance and driving performance in young adults after concussion

Author(s): Preeti Sunderaraman, Hong S. Eugene, Ang Jocelyn, Taylor Blake, Sandella J. Bradley, Zahedi Nazaneen, Martin Danielle , Schultheis T. Maria

OBJECTIVE: To examine and describe the changes in performance on cognitive tests (paper-and-pencil and computerized) and changes in driving performance, at two time points – immediately after concussion, and after medical clearance was given for return-to-play.
DESIGN: Prospective design, with consecutive referrals from the athletic trainer were assessed immediately after the concussion ($\bar{x}$=3 days), and again after medical clearance was given for return to play.
SETTING: All data were collected in an outpatient research setting.
PARTICIPANTS: Participants were college students (N=17; 11males, 6 females) with clinically diagnosed concussion. Mean age was 20 years, and 94% of them were Caucasians. All were active drivers with greater than 2 years driving experience. The mean number of

previously reported concussions was two.
MAIN OUTCOME MEASURES: Participants were administered a neuropsychological measures of attention, working memory and processing speed [parallel forms of the Symbol Digit Modalities Test (SDMT), Trails A and B and Digit Span], the Immediate Post-Concussion Assessment and Cognitive Testing (the ImPACT test), and a behind-the-wheel (BTW) driving simulator evaluation. For the driving performance, center lane deviation and velocity (speed) were examined for simple straight lane segments without distractions.
RESULTS: Preliminary examination of changes in performance from session one to session two indicated that the participants had improved performance on composite Processing Speed measure and the Total Symptom score from the ImPACT, and on Digit Span subtest. Driving performance improvement was observed in speed deviation for complex driving.
CONCLUSIONS: This preliminary evaluation of cognitive and driving performance suggests that changes in performance can be measured as recovery from concussion occurs.

Location: Row - C; Number - 29 Judging Time: 11:00a.m. - 12:30p.m.

Presenter(s): Kristyn Voegele Email: kkv27@drexel.edu
Major: Biology Academic Field: Biological Sciences
Faculty Advisor: Dr. Lacovara Email: kjl24@drexel.edu

Insights from a new specimen of the gavialoid Thoracosaurus neocesariensis from the Maastrichtian-Danian Hornerstown Formation, Sewell, NJ

Author(s): Kristyn Voegele, Athena K. Patel, Paul V. Ullmann, Kenneth J. Lacovara

A recently discovered specimen of the gavialoid crocodylian Thoracosaurus neocesariensis from the Inversand Company glauconite pit in Sewell, NJ, yields new phylogenetic and ontogenetic information about this rare taxon. Collected from the end-Cretaceous Main Fossiliferous Layer thanatocoenosis (death assemblage) of the Hornerstown Formation, these fossils represent a disarticulated but associated subadult individual. This new specimen includes a nearly complete lower jaw and the first well preserved articular, tibia, and ischium. Novel taxonomic insights from the lower jaw include 1) the angular-surangular suture passes broadly along the ventral margin of the external mandibular fenestra; 2) uniform size of teeth alveoli in the dentary posterior to the 4th alveolus; 3) anterior processes of the surangular are unequal in length; 4) surangular does not extend posteriorly to the tip of the retroarticular process of the articular; and 5) presence of a dorsoventrally oriented sulcus between the articular and surangular anteriorly. This smaller individual demonstrates two possible ontogenetic features: a linear frontoparietal suture between the supratemporal fenestra instead of a concavoconvex suture, and the 3rd and 4th dentary alveoli are not confluent and are equal in size, instead of separated with the 4th alveolis larger than the 3rd. In addition, the lingual foramen for the articular artery and alveolar nerve is solely on the articular on this individual, while for close phylogenetic relatives the lingual foramen is on the surangular entirely. This feature may possibly

represent independent evolution among gavialoids.

Location: Row - N; Number - 125 Judging Time: 12:30p.m. - 2:00 p.m.

Presenter(s): Dane Ward Email: dcw33@drexel.edu
Major: Biology Academic Field: Biological Sciences,
Faculty Advisor: Walter F. Bien Environmental Science
Email: wbien205@comcast.net

Population Estimate of the Northern Pine Snake, Pituophis melanoleucus, in New Jersey

Author(s): Dane Ward

Understanding population dynamics is paramount for successful management and long-term conservation of rare species. The northern pine snake, Pituophis melanoleucus, is a state-threatened species that is declining in New Jersey. Unfortunately, quantitative population data is lacking and the northern pine snake remains vulnerable as a result of potential delisting, habitat loss, habitat fragmentation, and isolation. We developed a population "density model" for estimating the number of pine snakes at the Warren Grove Gunnery Range (WGR). The model estimates the number of snakes per-unit-area (density) within preferred northern pine snake habitat (pine-oak forest). Utilizing local and habitat specific population densities we estimated an average of 229 adult snakes occur in the local population on WGR. These data were extrapolated to estimate the historic, current, and rate of decline of the northern pine snake population in New Jersey. We estimated that the northern pine snake has experienced declines from as much as 26,087 snakes in 1985 to 24,048 snakes in 2007, a decline of 98 adult northern pine snakes per year. Understanding population size and trends is imperative for improved conservation management of this threatened species.

Location: Row - E; Number - 44 Judging Time: 12:30p.m. - 2:00 p.m.

Presenter(s): Julianne Winters Email: jmwinte@gmail.com
Major: Environmental Science Academic Field: Biological Sciences
Faculty Advisor: Harold Avery Email: haltort@aol.com

Between the Bay and a Hard Place:
The Stress Response of Nesting Diamondback Terrapins due to Bulkheading in Barnegat Bay, NJ.

Author(s): Julianne Winters, Nicole M. Wood, Walter F. Bien, James R. Spotila, Edward A. Standora, David C. Rostal, Harold W. Avery

Barnegat Bay Estuary exhibits the highest development rate of any Mid-Atlantic estuary. In fact, bulkheading has increased 30% over the past thirty years along these shorelines, severely limiting the aquatic-terrestrial interface for wildlife. The diamondback terrapin (Malaclemys terrapin) requires the upland habitat that is blocked by bulkheading for annual nesting. To determine the effect of bulkheading on this threatened species' nesting behavior we measured terrapin movements, stress levels, and site fidelity in relation to artificial bulkheading over two seasons. In particular, adrenocortical responsiveness (i.e., stress) was quantified through measures of corticosterone and testosterone levels in relation to bulkheading exposure. Blood samples were drawn immediately upon capture from 91 nesting terrapins at both experimentally bulkheaded and adjacent reference beaches. In addition, 19 individuals were subjected to handling stress and bled again at 30 and 60 min following capture to create plasma profiles of acute corticosterone secretion. These data represent the first documentation of acute stress in nesting diamondback terrapins, exhibiting levels comparable to those of other Chelonians. Preliminary corticosterone and testosterone analyses show no significant difference between treatment, suggesting that bulkheading does not elicit a stress response in nesting terrapins. Thus, more robust analysis considering barrier exposure at an individual level are needed. We propose that our endocrinological records can be applied towards better understanding how human development can physiologically affect wildlife. With the increasing rate of bulkheading construction in Barnegat Bay, this study acts as a novel approach to guiding shoreline development within America's estuaries.

Location: Row - C; Number - 27 Judging Time: 11:00a.m. - 12:30p.m.

Presenter(s): Le Yu Email: ly32@drexel.edu
Major: Mathematics Academic Field: Mathematics
Faculty Advisor: Eric Schmutz Email: schmutze@drexel.edu

Automorphisms of Trees

Author(s): Le Yu, Eric Schmutz

Location: Row - A; Number - 9 Judging Time: 12:30p.m. - 2:00 p.m.

Presenter(s): Ashley Zervos Email: ashley.zervos@gmail.com
Major: Biology Academic Field: Biological Sciences
Faculty Advisor: Felice Elefant Email: fe22@drexel.edu

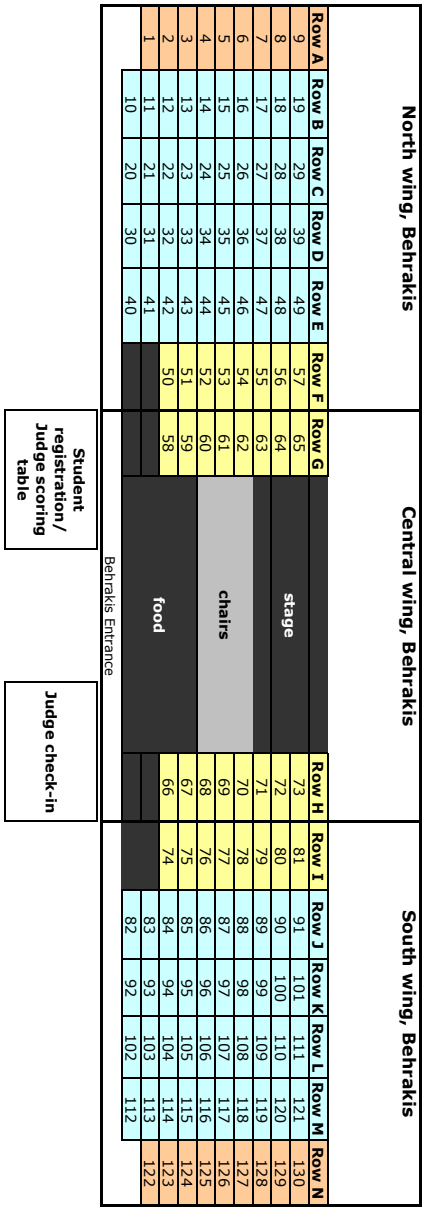
An epigenetic role for dTip60 in locomotion and axonal vesicle transport

Author(s): Ashley Zervos, William Reube

Histone acetyltransferases (HATs) are a key class of enzymes that control chromatin accessibility to regulate gene expression profiles critical for diverse cellular processes. Tip60 is one such HAT that has been shown by our laboratory to play a critical role in regulating neuronal genes linked to neurodevelopment and cognition (Genetics, 2007; PLoS ONE, 2010; PLoS ONE, 2011). Consistent with our findings, Tip60 has been implicated in the age-related neurodegenerative disorder Alzheimer's disease (AD) via its interaction with the AD linked amyloid precursor protein intracellular domain (AICD). This complex is essential for the epigenetic regulation of certain genes critical for neuronal function. Inappropriate complex formation may contribute to pre-clinical AD-related pathology by misregulation of target genes involved in neurogenesis; however a direct epigenetic based role for Tip60 in this process remains unclear. Here, we investigate a causative role for Tip60 in axonal vesicle transport, a process affected in the pre-clinical stages of AD, by modulating dTip60 HAT activity levels in the Drosophila nervous system. We show that reduction of Tip60 HAT activity specifically in the nervous system of the fly leads to locomotor defects and a distinctive tail flipping phenotype. These phenotypes are reminiscent of nervous system defects linked to mutations in genes required for axonal vesicle transport machinery. Confocal imaging of third-instar larval motor axons reveals abnormal vesicle aggregation and clogging in response to Tip60 HAT reduction. These defects are exacerbated by APP overexpression and dependent upon AICD, the region of APP that interacts with Tip60. Importantly, treatment of larvae with ms-275, a nervous system specific class 1 HDAC inhibitor, rescues both vesicle clogging in motor axons as well as locomotion defects. In addition to providing new biological insight into epigenetic gene control mechanisms underlying neurodegeneration in AD, these studies will be fundamental in exploring the utility of novel epigenetic-based therapeutics to improve healthcare and quality of life in the elderly. NIH grant HD045292-01 to F.E.

Location: Row - B; Number - 13 Judging Time: 12:30p.m. - 2:00 p.m.

Behrakis Hall Poster Layout

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