THE COLLEGE OF ARTS AND SCIENCES

RESEARCH DAY

APRIL 5, 2011

Welcome

On behalf of the College of Arts and Sciences, I welcome all student participants to the Eleventh Annual Student Research Day 2011. 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

Eleventh Annual College of Arts & Sciences Student Research Day

April 5th, 2011

COMMITTEE MEMBERS

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JUDGES

BIOLOGY

Shivanthi Anandan, Joe Bentz, Walt Bien, Dan Duran, Laura Duwel, Felice Elefant, Gail Hearn, Rebecca Hoffmann, Karen Kabnick, Dan Marenda, Mike O'Connor, Jacob Russell, Nianli Sang, Aleister Saunders, Elias Spiliotis

CHEMISTRY

Paul Deroo, Joe Foley, (Haifeng) Frank Ji, Dan King, Kevin Owens, Lynn Penn, Reinhard Schweitzer-Stenner, Kevin Shuford, Karl Sohlberg, Sally Solomon

CULTURE and COMMUNICATIONS

Maria Hnaraki, Barbara Hoekje, Maria de la luz Matus-Mendoza, Rakhmiel Peltz, Devon Powers, Susan Stein, Judith Storniolo, Carmen Vicente

ENGLISH and PHILOSOPHY

F. Elaine Delancey, Anne Hickson, Tobie Hoffman (English Language Center), Abioseh Michael Porter, Eva Thury

HISTORY and POLITICAL SCIENCE

Lloyd Ackert, Jonson Miller, Julie Mostov, Joel Oestreich, Donald Stevens

MATHEMATICS

Robert Boyer, Patrick Clarke, Bo Dong, Jim Donnelly, Anatolii Grinshpan, R. Andrew Hicks, Georgi Medvedev, Jennifer Morse, Eric Schmutz, Thomas Yu

PHYSICS

Alexey Aprelev, Shyamalendu (Sam) Bose, Luis R. Cruz Cruz, Len Finegold, Robert Gilmore, Srinivas Jampani, Jelena Maricic, Joseph Trout, Michel Vallieres, Brigita Urbanc, Guoliang Yang, Jian-Min Yuan

PSYCHOLOGY

Brian Daly, David DeMatteo, Maureen Gibney, Naomi Goldstein, Kirk Heilbrun, Marlin Killen, Michael Lowe, Chris Nezu, Mary Spier

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Undergraduate Student Presentations

Presenter: Zoha Ahmed Email: za57@drexel.edu
Major: IAS and Business Ad. Academic Field: History, Political Science, Sociology
Faculty Advisor: Rakhmiel Peltz Email: rp27@drexel.edu

Reconstructing History: Educational Restitution after Genocide

Author(s): Zoha Ahmed

In the past century, mankind has basked in the glory of some of its greatest accomplishments and yet, it has witnessed great wars and has carried out gruesome acts of genocide, mass murder and ethnic cleansing. Sadly, the 20th century has been stained with many terrible events, while we try to learn from the past and perform acts of reparation, we see that not much has been done to restore a 'destroyed heritage'. The idea of restitution had gained immense popularity by the end of the World War II. The perpetrators took admission of their acts; stolen art works, lands were returned to rightful owners, monetary compensations were made and the victim's were given the hope of restoration.
However the acts of genocide committed in the last twenty years were circumstances where neighbors, people from the same community plundered the victim's lives. And now, the perpetrator's and the victims have had to live together again but no apologies were made. In such communities that largely live in poverty, reconstruction is a difficult task. In my research, I examined the region of former Yugoslavia which is essentially a melting pot of differences, I studied about the efforts that were made to restore the victim's culture, whether the minorities were able to learn about their history, practice their religion, were educated in their native tongue and were able to express their cultural identity. It is through such measures of educational restitution that such communities will strengthen and live peacefully once again.

Row: A Poster Number: 2 Judging Time: 11-12:30

Presenter: Zeba Ahmed Email: zeba.ahmed@drexel.edu
Major: Biological Sciences Academic Field: Biological Sciences
Faculty Advisor: Dr. Joseph Bentz Email: bentzj@drexel.edu

Kinetic identification of membrane transporters that assist transcellular transport of many P-gp substrates across confluent cell monolayers

Author(s): Zeba Ahmed, Annie Albin Lumen, Harma Ellens, Joe Bentz

P-gp is a 170kDa transmembrane glycoprotein that effluxes a wide variety of xenobiotics in an energy dependent manner. It is expressed in normal tissues including liver, kidney, colon, placenta and the blood brain barrier and over-expressed in cancer cells showing multi drug resistance, which leads to chemotherapeutic failure. Understanding the functional aspects of P-gp is important to assess the risk of potential drug-drug interactions. Experimentally, confluent cell monolayers that over-express P-gp are used to study such interactions by conducting bidirectional transport and inhibition assays. Computationally, this transport kinetics is analyzed using a mass action kinetic model we constructed to fit for each elementary rate constant. Since P-gp's binding site lies in the inner leaflet of the membrane, to solve for the binding constant of a drug with respect to the aqueous phase we need to know its lipid - water partition coefficient. This is particularly useful in having a mechanistic understanding of the P-gp mediated transport. In this study we have measured the partition coefficients of various drugs to 3 different liposomes composed of apical outer leaflet (AO), basolateral outer leaflet (BO) and plasma cytosolic leaflet (PC) lipids. We also probed into the presence of any other transporters that aid in the transport of various drugs. Earlier we showed that digoxin requires an apical as well as a basolateral transporter, and loperamide uses a basolaeral transporter. Now, we found that the anti-cancer drug; vinblastine also requires both a basolateral and an apical transporter. Their identities remain unknown.

Row: I Poster Number: 78 Judging Time: 11-12:30

Presenter: Neha Manjari Akella Email: nma46@drexel.edu
Major: Biological Sciences Academic Field: Biological Sciences
Faculty Advisor: Matt Szapacs Email: matthew.e.szapacs@gsk.com

Detection, Extraction and Quantification of a siRNA Therapeutic from Rat Lung Tissue

Author(s): Neha Manjari Akella

siRNA therapeutics a novel field in science involves the degradation of mRNA and can be used for the treatment of many diseases. This method detects a 21bp siRNA molecule, an inhibitor for Chronic Obstructive Pulmonary Disease, in plasma and lung tissue. 9bp overhangs were hybridized and ligated to the siRNA molecule and read for chemiluminescence after conjugating with HRP labeled antibody. Liposome interference was also checked in plasma. Additional steps for background reduction and RNA stability were included for the lung tissue. Lung tissue was digested with Proteinase K after homogenization, followed by inhibition to stop the digestion. An extra step of nuclease digestion was included to help cleave unligated strands. Overall this helped reduce the background and make the assay more consistent.

Row: L Poster Number: 89 Judging Time: 12:30-2

Presenter: Seyma Akyol Email: sna28@drexel.edu
Major: International Area Studies Academic Field: International Area Studies
Faculty Advisor: Julie Mostov Email: mostovj@drexel.edu

Cosmopolitan Thinking as a Solution to Turkey's Entry to the European Union

Author(s): Seyma Akyol

As cosmopolitanism attempts to assert universal values which may be at odds with particular values that are constructed through culture and history, I argue that as an approach, cosmopolitanism does not provide a helpful framework for supporting Turkey's entry to the European Union.

Row: A Poster Number: 8 Judging Time: 11-12:30

Presenter: Lekhaj Daggubati Email: nra27@drexel.edu
Major: Biological Sciences Academic Field: Biological Sciences
Faculty Advisor: Aleister Saunders Email: ajs56@drexel.edu

The Role of Calcineurin in a Drosophila Model of Alzheimer's Disease

Author(s): Neha Arjunji, Brie E Paddock, PhD, Lekhaj Daggubati, Marianna Vinokur, Sean Miller, Aleister Saunders, PhD, Daniel Marenda, PhD

Our lab has developed a transgenic model of Alzheimer's Disease (AD) by expressing the wild type human forms of both APP and BACE within the CNS of Drosophila melanogaster. These transgenes, combined with Drosophila's endogenous functional homolog of the gamma-secretase complex, recapitulates the amyloidogenic proteolytic processing that occurs in AD brains. Calcineurin has been implicated in the pathology and progression of neurodegeneration in AD brains. We have used our transgenic APP:BACE Drosophila to test the role of calcineurin in AD using both RNAi knockdown and pharmacological techniques. Drosophila exhibit negative geotaxis by climbing upwards when tapped to the bottom of a vial, and disruption of this stereotyped response is indicative of nervous system dysfunction. Calcineurin inhibitors administered via feeding improve the impaired motor reflex behavior observed in the APP:BACE flies. RNAi-mediated knockdown of calcineurin in the APP:BACE Drosophila model also partially suppresses the defective climbing behavior. These studies emphasize the utility of this model for dissecting the molecular mechanism of neurodegeneration, as well as testing possible pharmacological interventions in an in vivo system.

Row: D Poster Number: 35 Judging Time: 12:30-2

Presenter: Sean Ballentine Email: sb623@drexel.edu
Major: Mathematics Academic Field: Mathematics
Faculty Advisor: Anatolii Grinshpan Email: tolya@math.drexel.edu

Napoleon's Theorem and Scaled Planar Rotations

Author(s): Sean Ballentine

Napoleon's Theorem says that if equilateral triangles are constructed on the sides of any triangle, either all outward, or all inward, the centroids of those equilateral triangles themselves form an equilateral triangle. In coming up with an alternate solution to this problem I decided to use a transformation on the set of position vectors of the original three vertices given by a scaled rotation on the side connecting two vertices that would correspond to the center of the equilateral triangle built on that side. This transformation produces another set of vertices for the resultant triangle. Originally, I incorrectly assumed I could repeat the transformation and show the vertices converged on the next step. But I soon realized I did not consider any changes in the orientation of points, I tried switching the orientation and the points converged. This brought about a question about whether a 30 degree rotation was the only transformation with this property.

Row: K Poster Number: 83 Judging Time: 11-12:30

Presenter: Warren Basla Email: wrb29@drexel.edu
Major: Anthropology Academic Field: Sociology
Faculty Advisor: Eva Thury Email: thury@drexel.edu

21st Century Skills: Who's Teaching Them, How and Assessment

Author(s): Warren Basla

This research is influenced by my past research with the College of Arts and Sciences' Humanities Fellowship on "Two-Year Colleges and the Invention of Nano-Labor: Between Promise and Possibility" with Dr. Mary Ebeling and Dr. Amy Slaton. I examined Nanotechnology programs at local Community Colleges, analyzed the history and current literature on Nanotechnology. The current body of research examined the understanding, or lack of, and implementation of 21st Century Skills in the National Science Foundation-funded award program, Research Experience for Undergraduates (REU), across the nation. As the Partnership for 21st Century Skills has stressed the importance of 'soft skills' on the K-12 levels, the National Science Foundation has listed 21st Century Skills—critical thinking, communication, creativity and collaboration—as necessary for all technical degree program students on the tertiary level. These soft skills paralleled prominent educationalist Tony Wagner's Seven Survival Skills in The Global Achievement Gap

(2008)—critical thinking/problem solving, collaboration/influence, adaptability, initiative/entrepreneurship, oral/written communication, assessing/analyzing information and curiosity/imagination. This research also examined the Bureau of Labor Statistics' Occupational Outlook Handbook (OOH) analyzing the trends in Nanotechnology-related labor in the United States. Through a series of phone and in-person interviews, I collected data from the REU award abstracts and primary investigators to analyze. Of the total 152 awards issued in the past five years, I focused on the 18 universities conducting research in the field of Nanotechnology. The following are a few questions I asked: Are 21st Century Skills taught in the program? How are these 'soft skills' assessed? This research illustrates how 21st Century Skills are taught in these programs and the overall skills students gain from this Research Experience for Undergraduates program.

Row: CD Poster Number: 33 Judging Time: 12:30pm-2pm

Presenter: Hannah Bennett Email: hmb38@drexel.edu
Major: History and Political Science Academic Field: History
Faculty Advisor: Kathryn Steen Email: steen@drexel.edu

Music and Medicine of the American Civil War

Author(s): Hannah Bennett

In this presentation, I focus on the role that music played during the American Civil War, particularly the connection between music and medicine. Whether out on the battlefield or in urban hospitals, music and medicine became closely linked, such as through the use of musicians as stretcher bearers and through the daily performance of bands at hospitals. This research was part of a larger project on the Civil War in Philadelphia and the production of a music CD.

Row: Q Poster Number: 140 Judging Time: 11-12:30

Presenter: Yuri Bong Email: yb46@drexel.edu
Major: English Academic Field: English
Faculty Advisor: Eva Thury Email: thury@drexel.edu

A Study of the Dream Sequences in Pier Pasolini's film "Medea" and novel Petrolio

Author(s): Yuri Bong

This research project will be a combination of Analysis of Trauma, Sex and Father Figures in Pier Pasolini's Petrolio, a project that I presented last year, and a study of the dream sequence in Pasolini's film "Medea." I will be analyzing the dream sequence that Medea has of killing Glauce, while referencing the 26 visions of The Shit that Carlo experiences while listening to a group of men share stories. Medea's dream is an example of Pasolini's deviation from Euripides' "Medea" and demonstrates her disconnect from reality. The dream shows Medea giving her priestess robes to Glauce, and this is a vision of Glauce's imminent death. In relation, Carlo's visions represent male sexuality and his desire to revert back to his mother's womb as The Shit and his girlfriend wander through a city. Both Medea and Carlo are subconsciously projecting their sexuality and maternity issues by being in an alternate state of mind. Using the idea of maternity as explained by Colleen Ryan-Scheutz in Sex, the Self, and the Sacred and the presence of bodily secretion in Petrolio, I have analyzed the similarities found in the dreams. My objective is to (1) connect the research I have done on Pasolini's father, Carl, as an influence on Pasolini's sexuality and use of women figures, (2) understand the similarities and differences of how maternity is shown in the dream and vision, (3) acknowledge Luce Irigaray's use of Lacanian theory but assert that Jason and Medea do not have a master/slave relationship, and (4) demonstrate the importance of the mirror images seen in Medea's dream in relation to feminist theory and anxiety disorder.

Row: C Poster Number: 28 Judging Time: 11-12:30

Presenter: William Brenner Email: web33@drexel.edu
Major: History Academic Field: History
Faculty Advisor: Chuck McNally Email: charles.david.mcnally@drexel.edu

The Teutonic Knights: Prussia and Beyond

Author(s): William Brenner

My project covers the structure, history, and practices of the Order of the Teutonic Knights, and their role in the Northern Crusades. The Northern Crusades, while less well-known than those to the Holy Land, were infinitely more successful, in that their goals were accomplished, and their successes maintained. My poster will have maps, covering the expansion of the campaign and the holdings of the Order, as well as listings of key dates and people. When questioned, I will also be able to answer questions pertaining to the Order itself, its practices and foundations, and the purposes for the Crusades into the Baltic region.

Row: AB Poster Number: 12 Judging Time: 11-12:30

Presenter: Stefan Brooks Email: shb39@drexel.edu
Major: Environmental Science Academic Field: Environmental Science
Faculty Advisor: Harold W. Avery Email: Haltort@aol.com

A comparison of seasonal abundance and distribution of vegetation in wetlands of southeastern Pennsylvania.

Author(s): Stefan Brooks, Steven H. Pearson, Dr. Harold W. Avery

Vegetation in freshwater wetlands and shallow lakes plays an integral role in maintaining biodiversity and function of shallow aquatic ecosystems and is sensitive to changes in precipitation, light, and temperature. Aquatic plants are generally defined as vascular plants completing their life cycles wholly or in part in a submerged state or in saturated soil. Wetlands located in southeastern Pennsylvania, have vegetative communities that differ between wetlands and seasons throughout the year. We studied the abundance and distribution of wetland vegetation in five southeastern Pennsylvania wetlands between May 2010 and October 2010. These included Silver Lake, Magnolia Lake, Mill Creek, Fort Mifflin Moat, and EMC-10. Silver Lake, Magnolia Lake, and Mill Creek are located in Bucks County, while Fort Mifflin Moat and EMC-10 are located in Philadelphia County. We mapped wetland vegetation by delineating the perimeter of emergent and floating vegetative beds using GPS units. We used these GPS data to map vegetation resources using ARC Map. We analyzed spatial differences between wetland vegetation at monthly and seasonal scales. A quadrat method was used to survey species specific abundance and distribution within all the wetlands. The abundance of vegetation increased significantly throughout the summer and a decreased in the fall. Vegetative cover varied with wetland the characteristics, depth and flow regime. Because aquatic wetland vegetation provides nutrition and habitat structure for aquatic wildlife, seasonal changes and wetland differences in vegetation are important in wildlife conservation and to wetland function.

Row: E Poster Number: 49 Judging Time: 12:30-2

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

Judges' Decision-Making about Juveniles' Adjudicative Competence: Against Whom to Compare Juveniles' Adjudicative Competency Abilities – Juveniles or Adults?

Author(s): Casey Burkard, Jennifer Mayer-Cox, Sharon Messenheimer, Christy Lane, Naomi E. S. Goldstein

This study investigated whether judges compare juvenile defendants' adjudicative competence abilities to those of other juveniles or those of adults, and whether this distinction impacts judges' views of the defendants' capacities. 342 judges reviewed a hypothetical competence evaluation of a juvenile defendant and answered questions about the youths' adjudicative competence and the reference group against which the youth was compared. Judges rated the juvenile defendant as significantly more competent when compared against another juvenile defendant than against an adult defendant. Similar findings were observed across legal setting (juvenile vs. adult court), defendant's age, and defendant's level of psychosocial maturity.

Row: Q Poster Number: 141 Judging Time: 12:30-2:00

Presenter: Ian Charlton Email: ian.e.charlton@drexel.edu
Major: History and Political Science Academic Field: History
Advisors: J. Miller, C. Ewasiuk, K. Steen, L. Ackert Email: jonson.w.miller@drexel.edu

Producing Men to Produce Glass, Producing Glass to Produce Men at the Dyottville Glass Establishment

Author(s): Ian Charlton

In the 1830s in Kensington, an early industrial community just two miles north of the City of Philadelphia along the Delaware River, Thomas W. Dyott conducted what he called an experiment in "Moral and Mental Labor." The experiment, the creation of a community called Dyottville, gained as much notoriety as the glass vials and bottles produced there. Dyottville represented a significant departure from conventional glassmaking enterprises. Glassmaking historian Helen McKearin describes this shift a movement from typical paternal communities "in which the paternalism emanating from the proprietor was similar to that of the Lord of the Manor," to Dyott's administration which was more akin to that of "a strict headmaster of a private boarding school. This analogy reveals something about the network of institutional arrangements in Philadelphia at the time: the connection between Dyott's disciplinary methods and those of emerging public institutions like Eastern State Penitentiary as well as combined public/private ventures like charity schools, which were the prototypes of common (or public) schools. I will argue that private capitalists like Dyott did not limit their horizon to shortsighted profiting through the production of commodities; rather, they had a long-term vision of producing a certain kind of individual. Businesspeople like Dyott were engineers of the soul. Dyott used new disciplinary techniques to engineer ideal on-site operatives who acted as agents of his governance in order to subvert the power of master glassblowers in the glassmaking process. These tactics reveal a close, mutually reinforcing relationship between

engineering new modes of production (specifically in the glass industry) and producing new kinds of citizens in the United States' early national period.

Row: D Poster Number: 43 Judging Time: 12:30-2

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

Microbial Communities within the Invasive Argentine Ant

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

Native to South America, the invasive Argentine Ant (Linepithema humile) has successfully established supercolonies throughout the world, causing extensive problems for native plants and animals in the invaded regions. L. humile is known to feed extensively on liquid diets—consuming "honeydew" (excrement) produced by sap feeding insects. It has previously been hypothesized that a reliance on such food sources may create a need for nutritional supplementation by coevolved gut bacteria. To initiate a study on this possibility, Argentine Ants from different supercolonies were collected at three sites in California. Genotyping of the 16S rRNA gene through T-RFLP and 454 pyrosequencing was used to characterize the microbial communities within guts and whole ants. Preliminary results show that different supercolonies from the same environment share similar gut microbial communities. T-RFLP analyses show a sharing of particular fragment sizes, suggesting that there are similar species present in whole ants of different L.humile supercolonies. In all of the supercolonies, bacteria from the families Alcaligenaceceae, Xanthomonadaceae, Phyllobacteriaceae, and Brucellaceae were found to be abundant. All have been found in other ant species while the former two are common in "herbivorous" ants feeding on similar diets as L. humile. Members of these families are also found in soil environments, and as beneficial or pathogenic associates of plants and mammals. 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.

Row: F Poster Number: 57 Judging Time: 12:30-2

Presenter: Hillary Clarke Email: hillary.clarke@gmail.com
Major: Architecture Academic Field: Psychology, Sociology
Faculty Advisor: Eva Thury Email: thury@drexel.edu

Beyond CPTED; Safety Through the Designed Environment with an Emphasis on the Human Condition

Author(s): Hillary Clarke

Underground public transportation systems have always presented a challenge to designers because, although they serve a public function, they are quite private in their enclosed nature and therefore have the tendency to foster environments that encourage loitering, vandalism, theft and acts of terrorism. As an architecture student, I am interested in the impact of design in both the physical and psychological security of public space. This research project seeks a better understanding of the role design plays in successful subterranean public transit systems through a critical evaluation of Crime Prevention Through Environmental Design (CPTED) strategies as defined by urban theorists, Paul Cozens, Greg Saville and David Hillier.
Employing the principles of environmental psychology and natural surveillance as espoused by the urban theorist and social activist, Jane Jacobs, as well as the ideas of Defensible Space and the creation of a sense of ownership in public spaces as described by the architect and urban planner, Oscar Newman, I compare the Market-Frankford and Broad Street lines in Philadelphia with the new universal design of the Copenhagen metro. This research shows that the challenges of subterranean urban design go beyond merely the physical aspects of the built environment. The solutions require an understanding of human psychology and sensitivity to the human condition to naturally create safe and beautiful public spaces.

Row: K Poster Number: 86 Judging Time: 11-12:30

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

A Prospective Study of Weight Gain Associated with Chronotype in College Freshman

Author(s): Elizabeth Culnan, Sarah E. Horsey, Michael A. Grandner, Jacqueline D. Kloss

During the first year of college, adolescents are susceptible to both weight gain and poor sleep habits. Sleep duration has been previously associated with weight regulation, though other aspects of the sleep-weight relationship, such as the role of circadian preference, still need to be explored. We hypothesized that eveningness would be associated with greater

weight gain during the Freshman-year, perhaps due to changes in sleep duration and erratic scheduling.
A series of self-report measures involving a demographic questionnaire and the abbreviated Morningness-Eveningness Questionnaire (rMEQ) were completed during the second week of participants' (n=137) freshman term, and follow-up measures were completed 8 weeks later. Of the initial 137 participants n=54 completed follow-up data, and thereby served as the sample of interest. Weight and height were collected to calculate BMI and assess weight gain. The rMEQ was used to assess participants' circadian preference.
The rMEQ identified 1 morning, 27 intermediate (no preference) and 26 evening types; therefore, all comparisons were between intermediate and evening groups. Over the course of the study, respondents in the intermediate group gained an average of .04 pounds, while respondents in the evening group gained an average of 2.65 pounds. T-tests found these changes to be statistically significant ($t(51)= 2.15$, $p<.05$), with evening types gaining significantly more weight compared to intermediate types.
These findings indicate that circadian preferences are associated with weight gain during the freshman year. Future studies should explore potential mechanisms for this relationship.

Row: Q Poster Number: 139 Judging Time: 12:30-2:00

Presenter: Evan Curtin Email: ec468@drexel.edu
Major: Chemistry Academic Field: Chemistry
Faculty Advisor: Jean-Claude Bradley Email: jeanclaude.bradley@gmail.com

The measurement and prediction of non-aqueous solubility to control reaction outcomes

Author(s): Evan Curtin

With knowledge of the solubility of the reactants and products, we can choose a solvent to optimize the reaction and isolate the product through simple filtration. Solubility data was determined via experimentation and was extrapolated along with a melting point to predict solubility in a variety of solvents at different temperatures. Specifically, this information will be used to optimize the Ugi reaction. Information pertaining to the Ugi reaction is obtained by investigation of imines, which are intermediates in the Ugi reaction. Imines can be synthesized by reactions of aldehydes and amines, reactants that can be easily obtained.

Row: R Poster Number: 153 Judging Time: 12:30-2

Presenter: Bethany Darby Email: bethany.darby@gmail.com
Major: Biological Sciences Academic Field: Biological Sciences
Faculty Advisor: Gail Hearn Email: gail.hearn@gmail.com

Comparison of Primate and Duiker Abundance at Moka, Bioko Island, Equatorial Guinea

Author(s): Bethany Darby, Dr. Gail Hearn, Dr. Tom Butynski

Bioko Island, Equatorial Guinea has been separated from mainland Africa for around 12,000 years, and during that time a surprisingly high number of native primate species (11, including 7 monkey species) and a surprisingly low number of duiker species (2) have persisted. As the largest mammals remaining on Bioko Island, the monkeys and the duikers are now hunted extensively throughout the island for a bushmeat market located in Malabo. In this study the conservation status of populations of both monkeys and duikers are assessed in the south-central highlands of Bioko Island, near the village of Moka, by comparing the encounter rates on census trails with results obtained by similar methods as in previous years. The average primate group encounter rate was 0.59 groups/km, which is consistent with rates from previous years. Therefore, with no statistical decline in primate group encounter rates, it is speculated that the primate populations have stabilized. Comparison to previous years, show an apparent decrease in primate diversity. 96% of total primate encounters were the Red-eared Guenon (Cercopithecus erythrotis erythrotis). Other species encountered include the Crowned Guenon (Cercopithecus pogonias pogonias) and Preuss's Guenon (Cercopithecus preussi insularis). Also, there was a surprising increase in encounter rate for both duiker species, but this preliminary analysis shows it is not statistically significant.

Row: D Poster Number: 36 Judging Time: 11-12:30

Presenter: John Dele Email: johndele_2324@yahoo.com
Major: International Area Studies Academic Field: International Area Studies
Faculty Advisor: Onaolapo Matthew Email: matoalways@yahoo.com

Ogunleke John Dele

Author(s): John Dele

Provide an opportunity to gain new prospective both on the subject matter of my own degree course(International Area Studies) and on the Life and culture of the country.

Row: A Poster Number: 10 Judging Time: 11-12:30

Presenter: Marc Doyle Email: mmd72@drexel.edu
Major: Physics Academic Field: Physics
Faculty Advisor: Roberto Ramos Email: robertoramos99@gmail.com

Preparation and Magnetic Properties of Co2Z Hexaferrite From Annealed Mixtures of BaM and Co2Y Hexaferrite Precursor Powders

Author(s): Marc Doyle, S.E. Hamermesh, M.W. Lattanzi, B.G. Kelly, K.M.Unruh

The transformation of fine mixtures of BaM and Co2Y hexaferrite powders to Co2Z hexaferrite has been studied by scanning electron microscopy (SEM), x-ray diffraction (XRD), and vibrating sample magnetometry (VSM) measurements. The precursor hexaferrites were prepared by a solution-phase auto-combustion method and subsequently mixed in a low energy rolling mill. The BaM/Co2Y mixtures were annealed at temperatures between 800 and 1300 degrees C in air for 2 hours. Over this temperature range a rapid decrease in the measured coercivity from a value of about 4 kOe, characteristic of the hard BaM component of the mixture, to a value of about 50 Oe, characteristic of the magnetically soft Co2Z phase, was observed. The coercivity reduction was accompanied by a modest increase in the saturation magnetization to a value of about 60 emu per g.

Row: K Poster Number: 84 Judging Time: 11-12:30

Presenter: Zachary Fleming, Brittany Manning Email: zf29@drexel.edu
Major: Psychology Academic Field: Psychology
Faculty Advisor: Anna Graefe Email: acg44@drexel.edu

Social Technology and its Effects on Face-to-Face Interaction

Author(s): Zachary Fleming, Brittany Manning, Katrina Serrano, Manychan Kongbounmy

In today's society, the presence of, and reliance upon, social technology is becoming increasingly noticeable in our everyday lives. Unfortunately this mode of communication is also becoming a problem for many, adversely affecting not only their social lives, but also their social tendencies. All 27 participants that took part in our study were given a survey to gauge their frequency of social technology use and their level of social interaction. All participants were Drexel University freshmen. Participants were also conducting surveys as part of a course requirement. As one may expect, we have found that social technology may have negative side effects on social interaction, if used excessively. This includes limiting the amount of face-to-face conversations with friends and time spent alone.

Row: N Poster Number: 110 Judging Time: 11:00-12:30

Presenter: Erika Foster Email: erika.r.foster@gmail.com
Major: Psychology Academic Field: Psychology
Faculty Advisor: Naomi Goldstein Email: neg23@drexel.edu

Developmental Maturity and Cell Phone Use While Driving

Author(s): Erika Foster, Sharon Kelley, Naomi Goldstein

It is no secret that young drivers are thought to be reckless individuals. Although this group accounts for 14% of the driving population, they are involved in 26% of all fatal car accidents (Seo et al 2004). This is due in part to the propensity of young drivers to use different types of technology, particularly cellular phones, while driving. In a survey of college students, 86% of them admitted to talking on a cell phone while driving (Schlehofer et al 2009). Although young drivers (age 16-24) are more likely to use a cell phone than older drivers, 8% versus 5% respectively (Cramer et al 2007), developmental maturity, rather than age may be responsible for this correlation.
The four components of developmental maturity: independent functioning, decision-making, emotional regulation, and general cognitive processing, vary within and between age groups. Targeting these factors as part of a secondary prevention strategy may be one of the more effective ways to reduce young drivers' use of technology. However, before an intervention strategy can be developed, the most malleable components of developmental maturity must be identified. This poster will provide an overview of the extant literature on each component of developmental maturity as it relates to driving behavior, and conclude with recommendations on which pieces of developmental maturity to target in a secondary prevention program.
The results of this research will provide relevant background information for a grant proposal to the National Institutes of Health (Principle Investigators: Dr. Maria Schulteis and Dr. Naomi Goldstein). The proposed study involves evaluating how young adults' behavior in a driving simulator relates to the components of developmental maturity and which of those components should be addressed in a secondary prevention program.

Row: C Poster Number: 26 Judging Time: 11-12:30

Presenter: Sarah Galante Email: seg53@drexel.edu
Major: Psychology Academic Field: Psychology
Faculty Advisor: Brian Daly Email: bpd36@drexel.edu

Examining the Relationship between Overweight and Mental Health: Possible Gender Differences?

Author(s): Sarah Galante, Lindsay Haston, Dr. Brian Daly

Obesity is a significant health problem confronting children and adolescents. Research has demonstrated that overweight adolescents are more likely to report depressive symptoms and lower self-esteem than their normal weight peers. In general, being recognized as obese or overweight has a negative impact on self-image and self-esteem. The negative image comes from their peers, family and often themselves. Our study examined gender differences in overweight adolescents in a diverse population with regard to their mental health.
The Youth Risk Behavior Survey (YRBS) was administered in Spring 2009 to 1,328 high school students from 47 randomly selected public schools in Philadelphia. Survey questions asked about student perception of their weight, and during the past 30 days, on how many days their mental health was not good?
Female adolescents that perceive themselves as overweight are 1.420 times more likely (CI: 1.363-1.479) to report experiencing a high amount of mentally unhealthy days in the past month as compared to female adolescents that perceives themselves to be normal weight. Male adolescents that perceive themselves as overweight are 1.175 times more likely (CI: 1.097-1.257) to report experiencing a high amount of mentally unhealthy days in the past month as compared to normal weight male adolescents.
Being female and overweight confers a higher risk of experiencing frequent mentally unhealthy days as compared to overweight males. However, for both genders, there is an elevated risk of experiencing mentally unhealthy days for those individuals that perceive themselves as overweight.

Row: A Poster Number: 11 Judging Time: 12:30-2

Presenter: Michael Gebert Email: mqg733@gmail.com
Major: Music Industry Academic Field: Communication, Philosophy, Sociology
Faculty Advisor: Eva Thury Email: thury@drexel.edu

New World Water: A Memetic Approach to Understanding Hip Hop Music & Culture

Author(s): Michael Gebert

Row: R Poster Number: 155 Judging Time: 12:30-2

Presenter: Joseph Gombarick Email: jcg53@drexel.edu
Major: Physics Academic Field: Physics
Faculty Advisor: Charles Lane Email: lane@duphy4.physics.drexel.edu

Alpha/Beta Discrimination in the Double Chooz Scinitllating Medium

Author(s): Joseph Gombarick

The ability to distinguish between alpha and beta decay events registering in a scintillating medium can be key to eliminating background 'noise' or spurious events unrelated to the matter at hand. Alpha events tend to cause excited triplet states in the medium, resulting in a noticeably lengthened 'tail' on the event. Using methods such as pulse shape discrimination we can match the signatures of each type of event to make the determination. Oxygen in the atmosphere can inhibit or quench the formation of excited triplet states and lead to no distinction between an alpha and beta event. In the end, we hope to be able to quantify this quenching effect and have the result be of use to the Double Chooz project itself.

Row: J Poster Number: 82 Judging Time: 11-12:30

Presenter: Ania Gosek Email: ag623@drexel.edu
Major: Psychology Academic Field: Psychology
Faculty Advisor: Naomi Goldstein Email: neg23@drexel.edu

Mental Health Symptoms in Female Juvenile Offenders: Relationships with Anger, Physical Aggression, & Relational Aggression

Author(s): Ania Gosek, Jennifer M. Serico, Christy Lane, Jaime Feehan, Amy Brammel, Naomi E. S. Goldstein

Juvenile offenders have significant mental health needs that are often overlooked. This poster will present the mental health needs of female juvenile offenders and examine the relationships between mental health symptoms and diagnoses and anger and aggression. Results from data from delinquent girls in residential placement revealed that participants experienced high levels of comorbid mental health symptoms, particularly anxiety.

Row: L Poster Number: 90 Judging Time: 11-12:30

Presenter: Patrick Griffith Email: gengriffpatrick@aol.com
Major: Biological Sciences Academic Field: Biological Sciences
Faculty Advisor: James Spotilla Email: spotiljr@drexel.edu

GFP homolog amfp486, as a Novel Biomarker for Early Indication of Thermal Bleaching Events in Anemone Mojano

Author(s): Patrick Griffith, Alexa Sabre

Green fluorescent protein (GFP), first isolated from the Cnidarian Aequorea aequorea, has been proven to be absolutely fundamental to the studies of biochemistry and molecular biology over the past few years, aiding primarily in the practice of fluorescent microscopy. GFP absorbs blue light strongly within the wavelength range of 450-495 nm and emits green light at a wavelength of 508 nm.

Regarding its relevance to the environment, with the progression of time, environmental changes, such as global warming, have become increasingly more pertinent to the modern day and age, thereby calling into question the response of various biological organisms to such variations. These environmental changes have long been hypothesized to affect marine organisms, such as sea anemones and corals, which emit fluorescence due to the presence of GFP. Therefore, the purpose of this experiment is to examine the effect of different environmental conditions, mainly temperature on the amFP486 gene, a GFP homolog. The results of this examination will then aid in estimating the response of marine organisms to environmental changes.

Concerning the methods that will be performed; Anemones in tanks #1-#3 will be subjected to incremental temperature increases of 2°C per 24 hour period, starting at 26°C and ending with 32°C. Tank #4 will stay at 26°C to serve as a control. Upon the end of each 24 hour period samples will be taken from each tank. Subsequent Multiplex PCR will be performed on amfp486 in relation to oxidative stress genes, toxic stress genes, and housekeeping genes.

Row: N Poster Number: 107 Judging Time: 12:30-2

Presenter: Drew McQuade, Mariya Osipchuk Email: lh334@drexel.edu
Major: Environmental Science Academic Field: Environmental Science
Faculty Advisor: Jacob Russell Email: jar337@drexel.edu

The Effects of Predation on the Diet and Gut Morphology of Trinidadian Guppies, Poecilia reticulata

Author(s): LeeAnn Haaf, Drew McQuade, Mariya Osipchuk, Karen Sullam, Jacob Russell, Susan Kilham

The size and shape of an organism's gut is often catered to the digestibility of its major food items. In Trinidadian streams, it is thought that the predators in streams play a key role in nutrient availability for smaller fishes, which may be apparent in their gut morphology. Trinidadian guppies, Poecilia reticulata, exist in mountainous streams in areas of high predation, in which there are several predators, as well as areas of low predation, where only one predator is present. Previous research has shown predation pressure in these environments shapes features such as differences in coloration, life history traits, and

growth rates. In this study, we examine how predation pressure influences diet composition of Poecilia reticulata, and, in turn, how this affects the gut length. The guppies for this study were collected from four high predation (HP) and four low predation (LP) sites within four distinct streams in the northern mountain range of Trinidad. The gut lengths of the LP guppies were found to be significantly longer than those of HP guppies in three of the four streams. This is most likely caused by significant differences in the total area of detritus between HP and LP in these three streams. These results suggest that predation pressure has an effect on dietary composition and the respective gut morphology of these guppies, revealing yet another way that these fish respond to differences between habitats.

Row: Q Poster Number: 138 Judging Time: 11-12:30

Presenter: Erica Halpern Email: emh83@drexel.edu
Major: Psychology Academic Field: Chemistry
Faculty Advisor: Sally Solomon Email: solomosd@drexel.edu

Synthesis of Silver Nanopartcles: Effect of Reaction Conditions

Author(s): Erica Halpern

Silver nanoparticles were prepared by borohydride reduction of silver nitrate. Various reaction conditions and their effect on product stability were investigated. These included relative amounts of reactants, stirring, rate of addition and temperature.

Row: M Poster Number: 101 Judging Time: 12:30-2

Presenter: Lindsay Haston Email: lh388@drexel.edu
Major: Psychology Academic Field: Psychology
Faculty Advisor: Brian Daly Email: bpd36@drexel.edu

Condom use among ethnically diverse adolescents: What is the influence of alcohol and marijuana use?

Author(s): Lindsay Haston, Sarah Galante

Survey data indicate that the current use of alcohol and marijuana has declined among high school students across the country. In addition, the number of individuals who reported having ever having sexual intercourse has declined. While the current body of research

addresses these issues separately, there is little investigation of these questions within an ethnically diverse population. Our study examined the risks associated with current alcohol and marijuana use as relates to condom use in a sample of ethnically diverse adolescents.
The Youth Risk Behavior Survey (YRBS) was administered in Spring 2009 to approximately 1,328 high school students from 47 randomly selected public schools in Philadelphia. Questions asked about current alcohol and marijuana use, as well as protection before last sexual encounter.
Analyses included chi square and relative risk calculations. Adolescents that report being current users of alcohol are 1.167 times more likely (CI: 1.099-1.238) to report not wearing a condom for protection during sexual intercourse as compared to adolescents that report not being current users of alcohol. Adolescents that report being current users of marijuana are 1.251 times more likely (CI: 1.176-1.331) to report not wearing a condom for protection during sexual intercourse as compared to adolescents that report not being current users of marijuana.
Findings reveal that the use of alcohol or marijuana confers risk in regards to whether or not the adolescent will use condoms as protection before sexual intercourse.

Row: R Poster Number: 147 Judging Time: 11:00-12:30

Presenter: Aimee Hildenbrand Email: akh38@drexel.edu
Major: Psychology Academic Field: Psychology
Faculty Advisor: Jacqueline D. Kloss Email: jdk29@drexel.edu

Coping with pediatric cancer: Strategies employed by children and their parents to manage cancer-related stressors

Author(s): Aimee Hildenbrand, Leela Banerjee, Psy.D., Kristen Kohser, LSW, Kathleen J. Clawson, MSEd, Melissa A. Alderfer, Ph.D., Lamia Barakat, Ph.D., Meghan L. Marsac, Ph.D.

Childhood cancer has been associated with both negative (e.g. posttraumatic stress) and positive psychosocial outcomes (e.g. high self-worth). However, few studies have investigated the strategies employed by families to manage cancer-specific stressors during cancer treatment, hindering efforts to promote optimal adjustment to pediatric cancer. The purpose of this study was to examine child coping and parent coping assistance with cancer-related stressors during treatment.
Participants included 15 child-parent dyads. Children ages 6-12 years (M = 8.80, SD = 1.7) currently undergoing cancer treatment and their parents participated in semi-structured interviews. Interviews were audio recorded, transcribed, and coded. Coding criteria were developed through an iterative process that combined a priori hypothesized themes with themes that emerged from the data.

Children and parents frequently identified multiple stressors associated with the physical and emotional aspects of pediatric cancer. To manage these challenges, children exhibited various strategies, including seeking social support and engaging in distraction and relaxation. Parents reported helping their child cope by providing information and promoting cognitive restructuring and social support. While the overall sample identified a broad range of coping methods, few strategies were identified within each family. Findings from this study indicate that families utilize few coping strategies to manage the physical and emotional challenges of pediatric cancer, suggesting that families could benefit from early interventions geared specifically towards coping with cancer-related stressors. Future research should examine coping strategies that predict positive psychosocial outcomes during and after pediatric cancer treatment in order to best target preventive interventions.

Row: P Poster Number: 125 Judging Time: 12:30-2:00

Presenter: Steven H. Pearson Email: kti25@drexel.edu
Major: Biological Science Academic Field: Environmental Science
Faculty Advisor: Harold Avery Email: haltort@aol.com

Diet and Feeding Habits of the Freshwater Turtles (Pseudemys rubriventris and Trachemys scripta elegans) Inhabiting Southeastern Pennsylvania Wetlands.

Author(s): Kristian Ingraham, Steven H. Pearson

In the eastern United States freshwater turtle communities consist of omnivores, herbivores and carnivores. We studied the diets of the native red-bellied turtle (Pseudemys rubriventris) and the introduced red-eared slider turtle (Trachemys scripta elegans) at the Silver Lake Nature Center in Bristol, PA and at Fort Mifflin in Philadelphia, PA. Dietary components were determined using stomach flushing and fecal samples and were identified and categorized to their lowest possible taxon. Items were measured by volume and mass to determine the relative abundance in the diet. Both red-bellied turtles and red-eared slider turtles are primarily herbivores with vegetation composing greater than 83% of their diet. Animal matter composed no more than 17% of the diet of either species. At Silver Lake Nature Center the diet of red-bellied turtles differed from that of red-eared slider turtles. Both turtle species fed on different plants and animal material was found in 17% of red-eared slider turtle's diet versus 7% in red-bellied turtles. At Fort Mifflin both species had similar diets consisting of approximately 86% plant material. By analyzing the taxonomic composition and relative abundance of dietary items a comparison between the two wetland complexes is possible. Wetland size and the degree of habitat fragmentation may contribute to the dietary resources available. Our findings suggest that potential for competition between invasive and native turtle species may be greater in smaller wetlands, compared to larger wetlands. These findings are consequential

to current and ongoing issues of land use and wetland destruction in southeastern Pennsylvania.

Row: F Poster Number: 59 Judging Time: 12:30-2

Presenter: Laura Knoll Email: lak53@drexel.edu
Major: English Academic Field: English
Faculty Advisor: Eva Thury Email: thury@drexel.edu

Spring Break: the Phenomenon

Author(s): Laura Knoll

This is a project that investigates the phenomenon that Spring Break has become. During the summer and fall terms of 2010 I interned with the Drexel Publishing Group. This internship allowed me to try my hand at writing articles and blogs, as well as catch a glimpse into publishing. Ever since this project, I have been consciously trying to strengthen my writing inside and outside of the classroom.
The project involved developing my writing portfolio through writing a work of creative nonfiction that includes the history of Spring Break, the cultural impact of the yearly event, and three anecdotal accounts of separate people on different trips which will include a personal account. This information has been gathered from articles, websites, and interviews. To include a bit of the economic side of Spring Break, the websites studied include MTV.com and Studentcity.com . From this article, readers will better understand Spring Break which started in the early 1930s and how it has grown into a major cultural experience in our society.

Row: R Poster Number: 154 Judging Time: 11-12:30

Presenter: Andrew Leahey Email: andrew@leahey.org
Major: Political Science Academic Field: History, Political Science
Faculty Advisor: Eva Thury Email: thury@drexel.edu

The Ecological Underpinnings of the New Jersey Pine Barrens Bog Iron Industry

Author(s): Andrew Leahey

This project examines bog-iron bed depletion in the New Jersey Pine Barrens, in the mid 19th century. It involves the industrial history of the region I am native to, the New Jersey Pine Barrens as well as scientific research. The field of the study is Science, Technology and Society. My interest in this project arose as a result of my work with Dr. Erik Rau, through the Drexel Humanities Fellowship, in the Summer of 2010. While working with Dr. Rau to explore the needs and concerns of representatives from Delaware industrial history repositories wishing to make their collections digital and searchable, I became interested in industrial history more generally. The New Jersey Pine Barrens lacks any central repository for research, and as such I saw first hand the difficulty inherent in researching a topic with no central point to find primary sources. The seminal works for the history of the New Jersey Pine Barrens are by Arthur D. Pierce and Richard T. Forman, but they do not address bog-iron bed depletion, in the mid 19th century. In the current study, I researched scientific studies of the ecological effects of the iron industry and the environmental underpinnings required for bog-iron beds to accrete; discovering that it was in fact the industrial practice of clear cutting for the purpose of charcoal manufacturing that directly lead to the protraction of the iron accretion, and collapse of the iron industry in that region.

Row: N Poster Number: 109 Judging Time: 12:30-2

Presenter: Remus Lee Email: ryl23@drexel.edu
Major: History Academic Field: History
Faculty Advisor: Professor Lloyd Ackert Email: lta24@drexel.edu

The Death of Imperial China: How Human Actions Take Down a 2000-Year Old Institution

Author(s): Remus Lee

The Chinese people have been ruled by empires for two thousand years. By the twentieth century, however, the cycle of imperial rise and fall had given way to a new government based on republicanism. This report charts the events of the fall of China's last imperial dynasty by emphasizing the actions of certain individuals as crucial to ending imperialism in China.

Row: F Poster Number: 55 Judging Time: 12:30-2

Presenter: Brian P. Leung Email: bpl28@drexel.edu
Major: Chemistry Academic Field: Biological Sciences, Chemistry
Faculty Advisor: Aleister Saunders Email: ajs56@drexel.edu

APP 3'UTR Sequences that Regulate its Expression

Author(s): Brian Leung, Neeraj P. Sebastian

Alzheimer's Disease is a neurodegenerative disease that is characterized by the deposition of amyloid beta (Abeta) and neurofibrillary tangles. Proteolytic cleavage of a transmembrane protein, Amyloid Precursor Protein (APP), creates Abeta peptides where the aggregated form leads to synaptic disruption and eventually neurodegeneration. Increased APP levels can lead to AD, presumably due to increased Abeta levels. We have demonstrated that APP levels can be negatively regulated by microRNA expression. MicroRNAs bind to the APP 3' untranslated region (UTR) to downregulate APP. We have identified a sequence outside of the predicted miRNA target sites that can regulate APP expression levels. Structural studies indicate that this sequence undertakes a unique secondary structure. Using transcriptional reporter assays and bioinformatics we have identified a sequence in the APP 3'UTR, but not in predicted miRNA binding sites, that can regulate gene expression. Utilizing the luciferase reporter assay, the presence of this sequence 3' of luciferase led to increased expression when compared to a disrupted control.

Row: F Poster Number: 56 Judging Time: 11-12:30

Presenter: Tze Yee Lim Email: tl344@drexel.edu
Major: Physics Academic Field: Physics
Faculty Advisor: Luis Cruz Email: lrc42@drexel.edu

3D Reconstruction of the Neurons in the Fruit Fly Cerebral Cortex

Author(s): Tze Yee Lim, Dan Marenda

The brain structure of the fruit fly (Drosophila melanogaster) has recently been of much interest to the biology community due to the fruit fly's short life span and ease of genetic manipulation. For this study, we focused on fruit fly's cerebral cortex neurons structural degradation due to normal aging and Alzheimer's disease. We located the neurons' coordinates, given images of fruit fly brain confocal microscopy slices from Dr. Dan Marenda. Using the neurons fluorescence and setting appropriate contrast and other image correction factors, we found the neurons' locations on each slice (xy-plane). Our main challenge was to determine unique neurons after combining all the brain slices in the z-direction to obtain a three-dimensional computer model of the neurons' structural

organization. Various parameters were explored to optimize the detection of neurons and the rejection of non-neuronal structure in the brain slices. The sensitivity and specificity against various parameters were plotted. Future work include looking for any recurring architectural patterns, as well as microcolumnarity by adopting a statistical density map method derived from condensed matter physics. Thus, our overall aim is to quantitatively compare the complex cortical architecture in healthy fruit flies versus aged ones and also those that were genetically modified to develop Alzheimer's disease, such that any significant correlation can be observed between microcolumnar structure of healthy, aged and diseased fruit flies. By studying fruit flies, we hope to gain an insight into the mechanics of brain degradation in human patients suffering from Alzheimer's disease.

Row: F Poster Number: 60 Judging Time: 11-12:30

Presenter: Kathryn Lomonaco Email: kfl26@drexel.edu
Major: Political Science Academic Field: Political Science
Faculty Advisor: William Rosenberg Email: rosenl@drexel.edu

The Efforts of Government and Businesses to Help Protect the Environment

Author(s): Kathryn Lomonaco

This paper will examine where the public feels environmental responsibility actually falls in current society. It takes into account public opinion of whether the government or businesses and industry are doing more to help the environment. This article covers the ideas of the public's opinions by looking at the gender and religious affiliation of these people to discover whether or not they feel government or businesses are doing more to help the environment. By examining a survey and other literary pieces this paper will uncover what the public thinks and if their gender and religious denomination have any affect on their concern and opinion of who exactly is taking care of the environmental issues in front of the world today.

Row: P Poster Number: 129 Judging Time: 12:30-2

Presenter: Charles Marine Email: cm467@drexel.edu
Major: Physics Academic Field: Mathematics, Physics
Faculty Advisor: Anatolii Grinshpan Email: tolya@drexel.edu

Equilibrium points due to Point Charges

Author(s): Charles Marine

Using Algebraic methods and potential theory, we discuss the problem of finding an upper bound on the number of equilibrium points of a potential due to several spatially non-degenerate fixed charges. This problem dates back to J.C Maxwell's claim on this upper bound, which he provided without proof, and is found to be correct. This study will look into the nature of these equilibrium points, and attempts to provide a proof for an upper bound.

Row: R Poster Number: 156 Judging Time: 11-12:30

Presenter: Peter Massey Email: phm24@drexel.edu
Major: Undecided Science Academic Field: Physics
Faculty Advisor: Brigita Urbanc Email: brigita@physics.drexel.edu

Structural elements involved in mediating amyloid beta-protein toxicity in Alzheimer's disease

Author(s): Peter Massey, Bogdan Barz, Brigita Urbanc

Alzheimers' disease (AD) is the prevalent form of a demetia, affecting over 5 million people in the U.S. alone. Substantial evidence implicates low molecular weight amyloid beta-protein (Abeta) oligomers, in the AD pathology. Two predominant forms of Abeta are 40 and 42 amino acids long with Abeta1-42 being more strongly associated with AD and forming more toxic oligomers. 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 Abeta1-42 relative to Abeta1-40 oligomers is associated with its increased toxicity. Here, we identified a hydrophobic amino acid F4 in this region that could potentially mediate an interaction of Abeta1-42 oligomers with a membrane. We used the DMD approach to study oligomer formation of the F4G mutants, [F4G]Abeta1-40 and [F4G]Abeta1-42, 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 to 13 that are characteristic for Abeta1-42 were observed in the mutant peptides. Instead, [F4G]Abeta1-42 formed an elongated protofibril (with oligomer order of 17). Intriguingly, our structural analysis demonstrates that the N-terminal region D1-R5 of the resulting mutant oligomers structurally resembles more Abeta1-40 than Abeta1-42. Based on these data, we hypothesize that [F4G]Abeta1-42 will exhibit reduced toxicity, as compared to Abeta1-40. If this hypothesis is correct, then designing small molecules that would bind and block the residue F4 of Abeta1-42 oligomers might represent an efficient therapeutic strategy.

Row: D Poster Number: 39 Judging Time: 12:30-2

Presenter: Tim McJilton Email: TimMcJilton@drexel.edu
Major: Physics Academic Field: Physics
Faculty Advisor: Steve McMcMillan Email: steve@physics.drexel.edu

Numerical Studies of Early Mass Segregation in Star Clusters

Author(s): Tim McJilton

Many young star clusters show signs of mass segregation -- that is, the most massive stars are preferentially concentrated toward the cluster center. However, in many cases, we do not expect that a cluster which started out in virial equilibrium without mass segregation would be able to achieve the observed degree of segregation in the time available. The goal of this project will be to perform numerical N-body experiments using the existing modules in the AMUSE code base to explore mechanisms by which dynamical mechanisms can account for prompt mass segregation in stellar systems.

Row: B Poster Number: 21 Judging Time: 12:30-2

Presenter: Alisa Melekhina Email: am887@drexel.edu
Major: Philosophy Academic Field: Philosophy
Faculty Advisor: Peter Amato Email: pa34@drexel.edu

Art in Literature as a Manifestation of Societal Values: Flatland and the Rococo

Author(s): Alisa Melekhina

Literature on Flatland usually follows one of two approaches, with a predominant emphasis on the former, – either it analyzes the mathematical viability of a two-dimensional world, or it illuminates the implicit satire on Victorian society. (See below for examples of such texts.) With the philosophy of math focusing on the metaphysics and epistemology of an alternate world, and the social satire adopting an ethical tint, missing is an examination of the aesthetics of Flatland. The fictitious Colour Revolt, crucial to the subsequent development of societal hierarchy in Flatland, provides a dynamic and previously overlooked glimpse into the concurrent development of art. The aesthetically barren and geometrically dominated scenery the main character A. Square is encountered in can be likened to the intellectually demanding Baroque and Neo-Classical art periods, while the brief fascination with colors can be seen as analogous to the preceding, whimsical Rococo period. The attitudes toward aesthetics in Flatland can illuminate our own attitudes evident through the historical development taken by various artistic periods, as well as illuminate prejudices evident in favoring certain types of “intellectual” art over others.

Row: C Poster Number: 32 Judging Time: 11-12:30

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

The Development and Validation of a Novel Aged Alzheimer's Disease Model in Drosophila melanogaster

Author(s): Sarah Michelson, Siddhita Mhatre, Radha Delvadia, Ioannis Anastopulos

Alzheimer's disease (AD) is a progressive neurodegenerative disease and the most common cause of dementia in the elderly. Neuropathology of AD is characterized by the accumulation of both β-amyloid (Aβ) peptides and neurofibrillary tangles in the brain. Aβ is generated by the sequential cleavage of amyloid precursor protein (APP) by β-site APP cleaving enzyme (BACE) and γ-secretase, producing Aβ40 and Aβ42 peptides, the latter of which is toxic and forms aggregates. Most animal models attempt to analyze this disease by expressing the human genes involved in AD throughout the animal's lifespan (early onset). Thus, the major limitation in studying AD is the difficulty in modeling late-onset Alzheimer's disease (LOAD) in an in vivo model organism. Here, we are developing a novel Aged AD model using Drosophila melanogaster which express human APP and BACE specifically in the nervous system. Benefits of our model include the development of behavioral and neuropathological symptoms later in the fly's lifespan due to suppressed, yet prolonged 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.

Row: M Poster Number: 99 Judging Time: 12:30-2

Presenter: James Monahan Email: jwm46@glink.drexel.edu
Major: Physics Academic Field: Physics
Faculty Advisor: Charles Lane Email: lane@duphy4.physics.drexel.edu

Cherenkov Signal Simulator for Water Veto Detectors

Author(s): James Monahan

Neutrinos are our best probe to physics beyond the Standard Model. Since neutrinos only interact via the weak force, they are exceptionally challenging to detect and require very large detectors with high sensitivity. One common component of these large detectors are Cherenkov detectors that use photomultiplier tubes (PMT) to observe Cherenkov cones that provide information about the incoming particle. The large scale of these detectors combined with their stringent sensitivity requirements make calibration of these PMTs

very challenging. Currently the methods used to characterize PMTs are simple and rely on light sources that do not closely reproduce Cherenkov light. Common light sources have longer wavelengths than Cherenkov light and do not have the cone shape. This project seeks to replicate these distinctive characteristics to allow more precise PMT characterization and modeling of the detector while still in a small lab setting where problems are easier to diagnose and address. The source of light will be a small Cherenkov flasher, using a small 207Bi source for electrons (~ 1 MeV) The Cherenkov medium will be a piece of fused silica, with a weak fused silica lens to adjust the resulting cone angle. Narrow band pass filters will be used to characterize the resulting spectrum of the light cone for use in developing calibration standards for the PMTs to be done in the lab before they are shipped off to the larger detectors and installed.

Row: O Poster Number: 122 Judging Time: 11-12:30

Presenter: Matthew Novin Email: msn38@drexel.edu
Major: Biology Academic Field: Biological Sciences
Faculty Advisor: Jacob Russell Email: jar337@drexel.edu

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

Author(s): Matthew Novin, Shivanthi Anandan, Michael Waring, Jacob Russell

Volatile organic compounds (VOC) are mixtures of up to 300 kinds of pollutants that plague indoor air. Studies have shown that headaches, fatigue, and skin/eye irritations can be caused by improper VOC concentrations. Excess exposure to chemicals such as benzene has been linked to immunological disorders, leukemia, and neurological damage. Current means of ventilating indoor air involve mixing with outdoor air in an inefficient attempt to dilute the VOCs. Biowalls, vertical arrays of plants synced with ventilation systems, represent sustainable alternatives that are becoming more common in the fight against indoor air pollution. Previous studies have shown the effectiveness of certain species of plants at purifying air; however the mechanisms are not fully understood. In this study, we used molecular and microbiological techniques to better characterize and identify root-associated microbes from Biowall-grown plants that may degrade harmful VOCs. Focusing on benzene as the VOC of interest, we cultivated and identified fungi and bacteria from plant roots that can utilize benzoate as a sole carbon source, implicating them as candidate agents for benzene degradation and air purification. Our results suggest that a variety of microbes from the roots of Biowall plants, especially fungi, may be capable of degrading benzene. Based on our culture-independent, molecular studies of bacterial communities from plant roots, it is clear that there are many others present that could contribute to the degradation of other harmful compounds.

Row: A Poster Number: 7 Judging Time: 12:30-2

Presenter: Shyam Patel Email: sap.0521@gmail.com
Major: Biology Academic Field: Biological Sciences
Faculty Advisor: Daniel Marenda Email: dm562@exchange1.drexel.edu

Novel Role of Daughterless in Drosophila melanogaster Central Nervous System

Author(s): Shyam Patel

Daughterless (Da) is an ubiquitous proneural transcription factor in Drosophila melanogaster as well as the homologue for the TCF4 gene in vertebrates. Mutations in the TCF4 gene cause a genetic disorder called Pitt-Hopkins syndrome and have been associated with Schizophrenia and nerve injury. Initially, Da was thought to be limited within the nucleus as a proneural protein; however, our neuroanatomical evidence in neuronal cell lineages suggest a potential role of Da within post-mitotic neurons, a function outside of its described role as a proneural gene. Surprisingly, Da also localizes in the axons of certain populations of neurons. Using the Gal4/UAS system, we knocked down Da in post-mitotic neurons in the developing fly brain. When compared to the wild type controls, flies with knock down had significant defects in brain morphology, suggesting a role for Da in post-mitotic neurons. Further experimentation is still necessary to determine the function of Da in these neurons, as well as on fly behavior. By studying the Daughterless gene, we hope to further understand its homolog TCF4, and better understand its roles in Pitt-Hopkins syndrome, Schizophrenia, and nerve injury.

Row: B Poster Number: 20 Judging Time: 12:30-2

Presenter: Maria Petrongolo Email: mep760@gmail.com
Major: Psychology Academic Field: Psychology
Faculty Advisor: Maria Petrongolo Email: 856 217 8159

Obstacles that Impact Research with Residential Juvenile Justice Facilities

Author(s): Maria Petrongolo, Maria Petrongolo, Christy Lane, Dan Pennacchia, Ania Gosek, Naomi Goldstein

Much research has been presented suggesting the importance of addressing the mental and psychological needs of youth placed in juvenile justice facilities. Mental health disorders affect many of the youth involved with the juvenile justice system (Teplin, Abram, McClelland, Dulcan, and Mericle, 2002). Because one of the aims of the juvenile justice system is rehabilitation, it is important to focus on these psychological needs in order to offer effective treatment. Effective treatment has the potential to produce positive results for the youth and reduce recidivism and justice-system involvement. However, there is a dearth of treatment outcome research in juvenile justice facilities. It is possible that the

obstacles involved in conducting research in these settings impact the ability to design and implement study protocols. There exist many obstacles when conducting research with youth within residential juvenile justice facilities. These obstacles include issues, such as ethical concerns, obtaining informed consent, selecting and assessing appropriate facilities, handling logistical issues, managing relationships with faculty staff, and system related attrition. Despite the major challenges these obstacles impose on a researcher's ability to design and conduct research, these obstacles are, in most cases, only briefly mentioned in the published reports of these studies. To further explore and understand each obstacle and its potential impact on research in these settings, this poster will thoroughly review the literature and offer examples from an experience executing a treatment outcome study in a juvenile justice facility.

Row: O Poster Number: 116 Judging Time: 11:00-12:30

Presenter: Jennifer Pillion Email: jep56@drexel.edu
Major: physics Academic Field: Physics
Faculty Advisor: Jian-Min Yuan Email: yuanjm@drexel.edu

Using a Kinetic Ising Model to Simulate Secondary Structure in Proteins

Author(s): Jennifer Pillion, Jian-Min Yuan

A Kinetic Ising Model is a two-state system that evolves over time. Using a folded state and an unfolded state, the secondary structure of a protein can be modeled and denaturation times can be studied.

Row: N Poster Number: 111 Judging Time: 12:30-2

Presenter: Ana Prelic Email: anprelic@gmail.com
Major: Psychology Academic Field: Psychology
Faculty Advisor: Naomi Goldstein Email: neg23@drexel.edu

Judges' Demographic Characteristics and Their Ratings of Juvenile Defendants' Adjudicative Competency Abilities

Author(s): Ana Prelic, Jen Mayer-Cox, Christy Lane, Sharon Messenheimer, Naomi Goldstein

This study examined whether judges' characteristics predicted their ratings of a juvenile defendant's adjudicative competence in juvenile and criminal court. 342 judges reviewed a forensic psychological report about a hypothetical defendant; only the defendant's age (12-17) and maturity level (less mature, more mature) varied across reports. Results revealed a significant difference between male and female judges' competency ratings in criminal court. There were no significant differences in judges' competency ratings based upon type of court in which they serve, years of experience, political orientation, or region of the country. Implications are reviewed.

Row: E Poster Number: 52 Judging Time: 11:00-12:30

Presenter: Laura Ramirez Email: lcr29@drexel.edu
Major: Biology Academic Field: Biological Sciences
Faculty Advisor: Daniel Marenda Email: dm562@drexel.edu

Expansion on novel Drosophila CHARGE model: Effects of Kismet/CHD7 in fly eyes and glutamate receptors in muscle

Author(s): Laura Ramirez

CHARGE Syndrome is a form of mental retardation caused by defects in the chromatin remodeling gene CHD7. Certain characteristics are associated with CHARGE Syndrome including visual impairments and motor coordination defects, but the molecular basis of these phenotypes are unknown. Different CHARGE model organisms have been created to better study the genetic and molecular basis of this syndrome, with the latest model being a CHARGE Drosophila melanogaster. This Drosophila model appropriately details CHARGE Syndrome using the homologue gene kismet, but more research is needed to fully understand the molecular basis for the phenotypes observed in this syndrome. Visual acuity in CHARGE flies has yet to be tested in this model, and the molecular basis for observed motor coordination defects have yet to be determined. Using this Drosophila CHARGE model, I propose to investigate the effects of kismet knockdown in fly eyes, as well as to determine the molecular targets of kismet in the muscle of CHARGE flies. I will be carrying out neuromuscular junction dissections in larval CHARGE Drosophila, staining for glutamate receptors, and imaging the larval walls to determine abnormalities in the quantity or in the structure of glutamate receptors. I will also be performing climbing assay rescue studies on CHARGE flies with upregulated ionotropic glutamate receptors to determine if motor coordination defects can be reversed. Lastly, I will be conducting a series of Fast Phototaxis Assays to test for visual acuity in CHARGE flies. Using these results, the role of kismet in CHARGE Syndrome will be better understood.

Row: B Poster Number: 22 Judging Time: 11-12:30

Presenter: Ruhee Rathod Email: Ruhee.Rathod@gmail.com
Major: History and Political Science Dual Major Academic Field: History
Faculty Advisor: Lloyd Ackert Email: lta24@drexel.edu

The Emergence of White Collar Crime Brought About By The Industrial Revolution: Great Britain's Response

Author(s): Ruhee Rathod

The economic, social, and technological innovations brought about by the Industrial Revolution in the late nineteenth century had a huge impact in Great Britain. Studying the evolution of crime in Great Britain presents a unique opportunity to explore a historical topic that has generated a great deal of contention; how to define the Industrial Revolution. The same technological innovations some argued, that triggered the Industrial Revolution, also caused an increase in embezzlement and theft in Great Britain. Police forces and legal institutions (courts) started transitioning from private to public in order to accommodate this evolving area of criminal law. As a result, civil matters needed to be dealt with publicly on the state level as opposed to privately on the individual level. The state responded to this rise in crime by increasing its ability to "search and arrest culprits." Offenses, which were generally considered torts, began to be classified as crimes. The Industrial Revolution facilitated this evolution of torts through the standardization of goods.

The following will focus on how the area of criminal law; white-collar crime emerged from the standardization of goods as related to the Industrial Revolution in Great Britain. A close focus will be made on how the Industrial Revolution presented more possibilities of theft and embezzlement. Britain's response in dealing with the emergence of white-collar crime will also be explored with a primary focus on the transformation of legal institutions such as the court and police forces to indicate the shift from civil to criminal legislation.

Row: A Poster Number: 9 Judging Time: 12:30-2

Presenter: Kristopher Ruth Email: kr88@drexel.edu
Major: History Academic Field: History
Faculty Advisor: Lloyd Ackert Email: lta24@drexel.edu

State Raised Militias during World War II: A Case Study of Pennsylvania's Reserve Defense Corps

Author(s): Kristopher Ruth

February 17th, 1941 marked a precarious time for Pennsylvania. As their National Guard marched out from stateside duty to join the ranks of the federal army, a nagging anxiety overcame state officials. A feeling of nervousness and apprehension grew from the loss of this reliable home security force at a time when another war seemed to be on the horizon. Although the country was still at peace, the PA National Guard was called up to active duty so that its men could train full time to prepare themselves in case the U.S. did get drawn into the war. In so doing, Pennsylvania was left without an organized military unit for self defense should the war in Europe spill onto American soil.
To counteract the widespread sense of vulnerability due to the loss of their National Guard, Pennsylvania found conciliation in forming a new state militia to serve in its place for the duration of the war. Designated as the Pennsylvania Reserve Defense Corps, this voluntary military organization functioned as the state's primary local defense force until the National Guard returned to state control in 1948.
The PA R.D.C. is but one example that can illustrate some of the more general aspects, functions, size, and scope of other State Guard units. The PA R.D.C. and other State Guard units serving in World War II have generally eluded our modern national conscience. However, it is important to remember such militias for the duties they performed during the war and to better understand some of the broader political issues concerning the nation at that time.

Row: D Poster Number: 37 Judging Time: 12:30-2

Presenter: Heather Schwartz Email: h.schwartz60@gmail.com
Major: Psychology Academic Field: Psychology
Faculty Advisor: Naomi Goldstein Email: neg23@drexel.edu

Pinpointing bullying: An analysis of peer group self-identification as it relates to context-specific bullying engagement and victimization

Author(s): Heather Schwartz, Naomi Goldstein, Ph.D

Bullying is a prevalent issue among school-aged youth and tends to be classified as at least one of three types of aggressive behaviors: verbal, physical, and/or psychological (Nansel et al., 2001). Although physical bullying usually dissipates after high school, verbal and psychological bullying frequently occurs at the university level in the form of relational aggression, a mesh of these two forms of aggression. Relational aggression is any form of covert behavior (e.g., gossiping, spreading rumors) used to manipulate and destroy relationships (Ellis & Zarbatany, 2007), and it typically occurs among members of social peer groups; more focus should be placed on the interactions of peer groups in schools when examining the effects of relational aggression because of the large number of social groups that exist. Students tend to socialize by joining mainstream peer groups in school (Laursen et al., 2010) and by subsequently forming smaller networks. Within these small

peer networks, group members tend to develop social status. Rankings, group status, how members identify themselves compared to others, and the environmental context (e.g., academic setting, unstructured social setting, structured social setting) are all factors that contribute to behaviors among group members (Ellis & Zarbatany, 2007) and can even be a predictor of relational aggression among students (Pokhrel et al., 2010). This poster will provide a brief theoretical background of bullying, and will address the results and implications of self-identity as it relates to where students may engage in relational aggression, to see whether or not bullying is context-specific.

Row: P Poster Number: 133 Judging Time: 12:30-2:00

Presenter: Neeraj Sebastian Email: nps26@drexel.edu
Major: Biology Academic Field: Biological Sciences
Faculty Advisor: Aleister Saunders Email: ajs56@drexel.edu

miRNA mediated regulation of PSEN1 expression

Author(s): Neeraj Sebastian, Nicole A Mantione, Aleister J Saunders

Abstract: Alzheimer's disease (AD) is the most common neurodegenerative disease in the industrialized world. Patients display cognitive decline, followed by dementia and finally death. Given an aging population and an estimated healthcare cost of $174,000 during the lifetime of a single patient in the US, it is of great importance to study the underlying mechanisms. PSEN1, a gene encoding presenilin-1 (PS1), is one of the major genes implicated in Alzheimer's disease as there are over 180 disease causing mutations found in it. PS1 is part of the γ-secretase complex which is involved in the production of the amyloid-β peptide, which can aggregate to form plaques which are the pathological hallmark of AD patients. miR-124 is the most highly brain-expressed microRNA (miRNA). It has been implicated in several important functions in neurons and is hypothesized to have a role in maintaining neuronal identity. A putative miR-124 binding site has been identified in the PSEN1 gene. Here we use an in vitro system to determine whether miR-124 can regulate PSEN1 expression

Row: O Poster Number: 121 Judging Time: 12:30-2

Presenter: Deborah Silverman Email: das325@drexel.edu
Major: Biological Sciences Academic Field: Biological Sciences
Faculty Advisor: Joe Bentz Email: bentzj@drexel.edu

Interpreting IC50 measurements of the P-gp Transport Network in a Confluent Cell Monolayer

Author(s): Deborah Silverman, Esteban Martinez, Annie Albin Lumen, Michael P. O'Connor, Joe Bentz

With its wide variety of substrates and ubiquitous expression in the body, P-glycoprotein (P-gp) is the frequent site of drug-drug interactions (DDI's). Pharmaceutical companies often measure the potential of a given inhibitor for P-gp-mediated DDI's through IC50 experiments in which drug transport is attributed solely to P-gp; however, we have previously shown through simulation that, for many P-gp substrates such as digoxin, there is kinetic evidence for other apical and basolateral transporters as necessary components of a P-gp transporter network. This being said, it is impossible to determine at which transporter a DDI between digoxin and an unknown inhibitor is occurring from the currently-used analysis. Here we utilize mathematical modeling to investigate whether transport in the apical-> basolateral direction as opposed to basolateral->apical direction suggests anything about the transporters involved in a given digoxin DDI. Our results show that transport when only one transporter is considered is simpler than when all transporters bind substrate and inhibitor. Furthermore, our data shows that transport directionality matters for IC50 analysis, especially at low values of inhibitor binding constant. Altering P-gp surface density alters IC50's for a given inhibitor binding constant, which is particularly apparent for low inhibitor binding constants. These results suggest that through mathematical modeling, we can observe "signature plots" which are directionality-dependent; thus observing trends in the IC50 shape may assist in determining at which transporter a DDI with digoxin may occur.

Row: O Poster Number: 113 Judging Time: 12:30-2

Presenter: Darlene Smith Email: des67@drexel.edu
Major: Communications Academic Field: Communication
Faculty Advisor: Eva Thury Email: thury@drexel.edu

Using Bullying Portrayed in Literature to Communicate Coping Skills to Students

Author(s): Darlene Smith

My volunteering experience with various youth based organizations in Philadelphia lead me to an interest in decreasing bullying in schools. I have heard repeatedly from students

that violence and bullying in schools often detract from their focus on studies. Through analyzing several popular novels suggested for 4th-5th graders, I have identified several descriptions of bullying, as defined by Smith and Brian, in literature. Victimized students in these novels were often from a lower socioeconomic background, physically deviated from average height and weight, and typically have lower self-confidence from a compilation of these contributing factors. According to the research on bullying compiled by researchers, Smith and Brian, bullying is a normative behavior in relationships, but these factors can increase the likelihood of bullying for a student. By having students read age appropriate books that show various ways to cope with bullying, students may recognize bullying as an aspect of life. Research by the Philadelphia School District focused on the effects of implementing bullying prevention programs. When fully implemented, these programs correlated with a decrease in reported violence. However, when only a portion of the program was implemented, schools actually saw an increase in reports of bullying. By assigning literary pieces with accurately portrayed bullying, bullied students could potentially feel as though they are not alone. Hopefully, positive coping skills will be instilled in the students through an existing aspect of the curriculum.

Row: QR Poster Number: 146 Judging Time: 12:30pm-2pm

Presenter: Justin Sochor Email: jas429@drexel.edu
Major: History Academic Field: History
Faculty Advisor: Lloyd Ackert Email: lta24@drexel.edu

Lines in the Sand: How Four Miles and Two Men Changed the Course of World War II

Author(s): Justin Sochor

General Erwin Rommel had earned his fame as the Desert Fox chasing the British Army from one side of Africa to the other. He charged headlong into battles alongside his troops suffering as they did, earning their respect and undying loyalty. He would march an underfunded, under-equipped, under staffed army through the desert in single minded pursuit of victory.
General George Patton had earned his fame as the brash, audacious commander of America's first tank attack in World War I, and the no excuses commander of the entire II Corps. He demanded his troops exert every effort, exhaust every option, and never to quit because someone is depending on you.
The training and indoctrination of the officer corps under these men would be put to the test in the sands of North Africa at the Battle of Kasserine Pass. Here we see that General Patton's rough handling of the Officers, the encouragement to think freely, and his emphasis on logistics triumphed over Rommel's hands on attempts to achieve glory.

Row: I Poster Number: 76 Judging Time: 11-12:30

Presenter: Kevin Trainer Email: kevinptrainer@gmail.com
Major: Physics Academic Field: Physics
Faculty Advisor: Yang Email: Guoliang Yang

Investigating the effects of macromolecular crowding on DNA conformations with Atomic Force Microscopy

Author(s): Kevin Trainer, Guoliang Yang

The effects of macromolecular crowding on the conformations of double-stranded DNA molecules by imaging DNA molecules deposited on a mica surface under various crowding conditions is studied. In living cells, DNA molecules interact with a wide variety of proteins and undergo many structural, conformation and topological changes in order to efficiently express the encoded genes. The crowded conditions restrict the conformational space of the DNA molecules and alter their mechanical properties, therefore, modulating the gene expression process. We will investigate the conformational changes of DNA molecules induced by several different crowding agents, and quantify their elastic properties in different solution conditions. Using dextran molecules of different molecular weights as the crowding agents, DNA molecules will be dissolved in solutions with a specified concentration of dextran, and deposited on a mica surface. AFM images of the DNA molecules will be analyzed using established polymer theories to determine their bending rigidity. In these experiments, individual molecules of DNA can be identified in the AFM images, therefore, the heterogeneity of the macromolecular crowding effects can be evaluated, in addition to the average effect.

Row: E Poster Number: 54 Judging Time: 11-12:30

Presenter: Justin Ulmer Email: jcu26@drexel.edu
Major: History and Political Science Academic Field: History
Faculty Advisor: Lloyd Ackert Email: lta24@drexel.edu

An Analysis Of A Federal Reserve Chairman: Arthur Burns' Reaction To The 1973 Oil Embargo

Author(s): Justin Ulmer

Arthur Burns was one of the United States' leading empirical economists. He is known worldwide for his work defining, measuring, and investigating business cycles. Throughout his career as Chairman of Eisenhower's Council of Economic Advisors, President of the American Economic Association, and President of the National Bureau of Economic Research, he was a strong and sustained advocate for the importance of analyzing and using economic indicator data to formulate monetary policy --- implementing expansive

monetary policies to counteract recession indicators, and monetary tightening to counteract inflation indicators.
In 1968, when Burns became a counselor to newly elected President Nixon, the United States was facing a rapidly increasing federal deficit, and an inflation rate that had tripled from previous decades. In 1970, when Nixon appointed Burns Chairman of the Federal Reserve, Burns was confronted with stagflation -- high unemployment and inflation. The existing economic theory that Federal Reserve policies should focus on maintaining unemployment at 4 percent was ill suited to deal with the co-occurrence of inflation and unemployment. Moreover, the White House economic policy agenda was to promote monetary expansion going into the 1972 election by implementing wage and price controls. From 1970 to 1972, Burns voted to lower the federal funds rate in hopes of lowering unemployment, seemingly ignoring the position he espoused throughout his career to react to inflation with monetary tightening. Political pressure from the White House, including negative press and moves to reduce the power of the Federal Reserve, may have contributed to Burns' taking this stance, so at odds with his prior beliefs, statements, and actions.
When the Oil Embargo hit in October 1973, Burns cut or maintained interest rates, and the already inflated money supply spiraled out of control. The objective of this paper is to answer the question "What are the factors that prompted Burns to react to the Oil Embargo in a way that violated his training and life's work?" By understanding Burns' reaction, we may be in a better position to solve other highly politicized economic problems.
The first and second sections of this paper provide background to the analysis by describing Burns' economic research and philosophy, and how he applied his economic principles to problems of an underperforming economy, specifically, unemployment and inflation. The third section of the paper presents a historiographical analysis of Burns' tenure as Federal Reserve Chairman, focusing on his reaction to the Oil Embargo. The concluding section of the paper summarizes the results of the analysis, and suggests implications of the findings for economic policy decisions we face today and in the future.

Row: H Poster Number: 72 Judging Time: 11-12:30

Presenter: Anika Vittands Email: amv36@drexel.edu
Major: Biology Academic Field: Biological Sciences
Faculty Advisor: Gail Hearn Email: gail.w.hearn@drexel.edu

Habitat Preference of Frogs and Toads at Moka, Bioko Island, Equatorial Guinea

Author(s): Anika Vittands

Although research has been done on the distribution of frogs and toads on Mount Cameroon, very little is known about these animals on the volcanic peaks of nearby Bioko Island. A study on Habitat preference of the island's common frogs and toads was conducted in the protected Southern Highlands of Bioko Island, focusing near the Bioko Biodiversity Protection Program's Moka Wildlife Center. Using a 9.13 kilometer trail

system, a total of 39.37 kilometers of census was completed, examining the trail, 1 meter on each side, for anurans (frogs and toads). A total of 77 anurans were observed which could be grouped into 3 species of frogs(genus Arthroleptis) and 2 species of toads(genus Bufo). Trails were characterized by habitat type. No anurans were found in the Banana Plantations. Toads, in relatively small numbers, were found in all other habitat types but preferred more open habitats (agriculture and elephant grass). Frogs preferred habitats with denser vegetation, occurring in larger numbers in bracken fern, secondary and primary forest, and in high numbers in tree fern forests.

Row: R Poster Number: 152 Judging Time: 11-12:30

Presenter: Theresa Weiss Email: tnw32@drexel.com
Major: Biology Academic Field: Biological Sciences
Faculty Advisor: Shivanthi Anandan Email: anandans@drexel.edu

The Over Expression of the lrrA gene in Synechococcus Elongatus

Author(s): Theresa Weiss, Simara Price, Shivanthi Anandan

Cyanobacteria are prokaryotic photosynthetic bacteria found in aquatic environments. Synechococcus elongatus is a unicellular, rod shaped cyanobacterium with a genome size of 2.7 mb. The Synechococcus genome contains a gene called lrrA whose predicted protein sequence has similarity to LysR type transcriptional regulators (LTTRs). A characteristic of LTTRs is that they transcribe the adjacent gene that is transcribed divergently. The lrrA gene is located adjacent to the orfG gene on the genome. The orfG gene has been previously found in this lab to regulate growth in this organism. We hypothesize that the lrrA gene regulates the expression of the orfG gene. Previously, inactivation of the lrrA gene lead to the death of Synechococcus cells, indicating that this lrrA gene is essential for survival. Because lrrA is essential for survival, the function of the gene needs to be found through alternate strategies like overexpressing the gene or using the antisense lrrA gene. We will describe the construction of a Synechococcus elongatus strain carrying the overexpression and antisense expression construct in this poster.

Row: G Poster Number: 67 Judging Time: 12:30-2

Presenter: Amanda White Email: ajw73@drexel.edu
Major: Physics Academic Field: Physics
Faculty Advisor: Michael Vogeley Email: vogeley@drexel.edu

UV Star Formation Rates of Dwarf Void Galaxies

Author(s): Amanda White

Because of their size, dwarf galaxies are very sensitive to the effects of interactions and feedback on star formation. By studying dwarf galaxies in voids, the most underdense regions of the universe, we can test features of theories for structure galaxy formation and evolution. Using ultraviolet and optical photometric data from the Galaxy Evolution Explorer (GALEX) and the Sloan Digital Sky Survey (SDSS), we have computed the UV star formation rates of a sample of dwarf galaxies residing in voids. These star formation rates are a first look at how star formation affects the growth of dwarf galaxies.

Row: P Poster Number: 128 Judging Time: 11-12:30pm

Presenter: Aviral Yadav, Mario Gioia Email: apy23@drexel.edu
Major: Biology Academic Field: Biological Sciences
Faculty Advisor: Nianli Sang Email: ns448@drexel.edu

Glutamine-Depletion Up-Regulates Phosphoenolpyruvate Carboxykinase 2 Expression

Author(s): Aviral Yadav, Mario Gioia, Shou Qie

Phosphoenolpyruvate carboxykinase 2 (PEPCK2) is the rate limiting enzyme in gluconeogenesis. This enzyme converts oxaloacetate into phosphoenolpyruvate and carbon dioxide. Its activity has been proposed to have important implications in the pathogenesis of cancer, diabetes and obesity. Mammals have two forms of PEPCK; the cytosolic form (PEPCK1) and the mitochondrial form (PEPCK2). The regulation of PEPCK1 and its potential involvement in type II diabetes have been intensively studied, while the regulation and biological importance of PEPCK2 remain unclear. We found that in hepatocyte derived tumor cell lines, the expression level of PEPCK2 was stimulated upon glutamine depletion. This has been confirmed by repeated real-time quantitative PCR and microarray-based mRNA profiling. To further elucidate the underlying biomedical mechanism, we have designed a PCR based strategy to clone the promoter region of the PEPCK2 gene. Specifically, we have designed primers to amplify two 5'-non-translated DNA fragments (up to -2058 and -1025 relative to start, respectively). So far we have successfully amplified the -1025 bp fragment, which will be used to drive the expression of a luciferase reporter gene. Mutagenesis analysis of this sequence will allow us to determine if this fragment contains any cis-element responsive to the glutamine depletion. Since glutamine plays essential roles in both carbon and nitrogen metabolism, our findings may provide new insight into the coordinated control of utilization of nitrogen and carbon sources in human cells.

Row: A Poster Number: 5 Judging Time: 12:30-2

Presenter: Gavin Youngs Email: gay24@drexel.edu
Major: Software Engineering Academic Field: Sociology
Faculty Advisor: Eva Thury Email: thury@drexel.edu

Ecology of the Gods

Author(s): Gavin Youngs

In recent years, there has been an upsurge of interest in classical mythology among purveyors of popular culture. Within the last year, two major motion pictures have been produced telling stories of the Greek gods and their interactions with mortals, following several popular series of books in the same vein. Give the researcher's aspiration to publish literature in this vein, a study of how modern society views the relationship between classical gods and mortals is in order. Analysis of Rick Riordan's Percy Jackson and the Olympians series, Neil Gaiman's novels American Gods and Anansi Boys, and the roleplaying game Scion from White Wolf Publishing provide samplings of young adult, adult, and interactive fiction prominently featuring classical gods as main characters and supporting cast. Through Joseph Campbell's hero journey, Victor Turner's writings on liminality and Claude Levi-Strauss' writings on nature and culture, and the additional insight on their work provided by researchers like Robert Segal, we can apply the same perspectives ancient peoples applied to gods to learn what modern needs are being filled by this new focus on the mythological. Additional insight into the nature of a modern gnostic age, and what this means for mythology, comes from authors like Elaine Pagels. Ultimately, what is revealed is a perception of detachment from the divine, an active disinterest in nonscientific aetiological tales, and a resulting interest in mortals and the gods they deal with.

Row: M Poster Number: 95 Judging Time: 12:30-2

Presenter: Nazaneen Zahedi Email: nazaneen.zahedi@gmail.com
Major: Psychology Academic Field: Biological Sciences, Psychology
Faculty Advisor: Maria Schultheis Email: schultheis@drexel.edu

Examining Visuospatial and Verbal Learning in Multiple Sclerosis

Author(s): Nazaneen Zahedi, Maria Schultheis

The objective was to identify whether those with multiple sclerosis experiences more difficulties with visuospatial learning or verbal learning. MS samples will be compared to healthy controls in order to determine what area the MS population is stronger. The funding source for this study was the National MS Society.

A total of 96 community dwelling participants--30 healthy controls, 66 MS. Out of the 66 participants with MS, 2.1 percent had progressive relapsing MS, 59.4 percent had relapsing remitting MS, 5.2 percent had secondary progressive MS, and 2.1 percent had unknown MS diagnosed at a mean of 8.88 years ago (symptom manifestation average of 13.7 years ago). The MS sample consisted of 52 females and 14 males at an average age of 43.24, while the HC sample consisted of 19 females and 11 males at an average age of 37.3 years.
Participants were tested using the California Verbal Learning Test- Second Edition Short Form (CVLT-II) to assess verbal memory and the 7/24 Spatial Recall Test (7/24 SPART) to assess visuospatial memory.
After analyzing the data with an independent-samples t-test, it was concluded that the 7/24 SPART displayed significant results in the administration of set B ($t(93) = 4.165$, $p = .00$), in which the healthy controls performed better on the task. Also, the CVLT displayed significant results in short delay recall. In both the short delay free recall ($t(93) = 2.35$, $p = .02$) and the short delay cued recall ($t(93) = 2.01$, $p = .04$) the healthy controls performed significantly better than the MS sample.
Although there was no clear distinction as to which learning style is stronger in an MS population, one could conclude that there is strong evidence that those with MS experienced more difficulties with short term memory in verbal learning as indicated by their scores in the CVLT, and with interference in visuospatial learning as indicated by the results from the 7/24 SPART.
Some recommendations for further research are a larger battery of tests. Examples include the WAIS-II Block Design and the Rey's Complex Figure test for visual spatial learning. Also, a more balanced sample as the current sample is skewed towards females. Furthermore, it might be interesting to examine interference in verbal learning and short term memory in visuospatial learning in order to determine from this data which learning style is more affective.

Row: E Poster Number: 47 Judging Time: 12:30-2

Presenter: Adam Zahn Email: alz26@drexel.edu
Major: IAS/Writing and Publishing Field: Anthropology, English, IAS
Faculty Advisor: Eva Thury Email: thury@drexel.edu

On Creative Nonfiction Writing as a Tool for the Ethnographer

Author(s): Adam Zahn

My experience in Yaoundé, Cameroon has completely defined who I am today. Everything I knew about my culture, my family, and my life was stripped, turned upside down, inside out. Teaching at Bitamie Lucia Nursery & Primary School taught me about cultural understanding, challenged me to understand my own misperceptions about culture, and tested the limits of what I thought I could tolerate. Upon my return, I knew that I wanted to

take these experiences and write about them in a memoir, combining elements of creative nonfiction and ethnography. Upon my return, I learned to read like a writer, thanks in part to the revolutionary research by Francise Prose on the art of reading with the goal of crafting. I also used my blog, Un Voyage Au Cameroun, as raw material for my larger piece. Creative nonfiction is a recent, controversial genre, emerging only in the last few decades as its own form and includes memoir, essays, technical and science writing, and travel writing among other types. Kirin Narayan writes on how creative nonfiction lends a tool to help ethnographers better present the cultures that they study. Ethnography without creative nonfiction does not allow us to intertwine and relate to the elements of culture. I decided to use this technique to help write my memoir with a goal of future publication.

Row: R Poster Number: 150 Judging Time: 12:30-2

Presenter: Lisa Zhao Email: lmz28@drexel.edu
Major: Psychology Academic Field: Psychology
Faculty Advisor: Maria T. Schultheis Email: maria.teresa.schultheis@drexel.edu

Analysis of Executive Functioning Degeneration in the Progression of Multiple Sclerosis by Comparing Low and High Severity Groups

Author(s): Lisa Zhao

Executive functioning is often vulnerable to neurological diseases, such as multiple sclerosis (MS). Capabilities become increasingly worse as time and the disease progresses. This paper examines overall development of executive functioning declination by analyzing executive performance of MS patients in different stages of the disease.
Sixty six adults (average age 43.24, standard deviation plus or minus 8.07, range of 23 to 56 years old) with different forms of MS (86 percent relapsing remitting, 7.6 percent secondary progressive, 3 percent progressive relapsing) participated in the study. Participants were separated according to MS severity, either "low" or "high", using scores from the Expanded Disability Status Scale (EDSS), a commonly used evaluation for MS severity. They then underwent a neuropsychological battery, tailored by assessments that measure executive functioning: PASAT, Trail Making Test B, Stroop Test, Oral Symbol Digit Modalities Test, DKEFS Tower Test, and WASI Matrix Reasoning. Performances were compared between the different severities.
Comparative mean analyses between EDSS score and executive functioning performance were conducted. No analyses were statistically significant, but apparent differences were observed. In comparing low and high groups, low severity groups had outperformed high group in most tests, with the exception of PASAT total correct score.
There is an apparent trend of overall better performance of executive functioning for those with lower severity of MS than those with a higher severity. Neuropsychological assessments tailored to examine executive capabilities, such as task switching, reasoning,

attention, and problem solving, determined that with development of MS comes with deterioration of executive functioning.

Row: P Poster Number: 124 Judging Time: 11-12:30

Graduate Student Presentations

Presenter: Xiaobo Bai Email: xb24@drexel.edu
Major: Biology Academic Field: Biological Sciences
Faculty Advisor: Elias Spiliotis Email: ets33@drexel.edu

Understanding How Microtubules Interact with Septin GTPases

Author(s): Xiaobo Bai, Napoleao Valadares, Renae Judy, Elias T. Spiliotis

The microtubule (MT) cytoskeleton is important for many cellular processes including vesicle transport and mitosis. MTs are highly organized structures and are tightly regulated. Besides well known regulators like microtubule associated proteins and plus end binding proteins, it was recently found that septins (SEPTs), a group of filament-forming GTPases, colocalize with MTs and affect MT organization and functions. However, how septins interact with microtubules is unknown. Mammalian septins are classified into 4 groups: SEPT2, SEPT6, SEPT7 and SEPT9. The building block of septin filaments is a SEPT9/7/6/2-2/6/7/9 octamer, in which each septin is replaceable by other members of the same group. By modeling the interaction of SEPT2/6 with microtubules, we identified a positively charged α-helix and loop domain within the SEPT2 structure. We hypothesized that these domains interact with the negatively charged C-terminal tails of tubulin. Alanine scanning mutagenesis of the positively charged residues in the α-helix of SEPT2 decreased the number of MT-associated septin filaments, while mutations in the loop region had no effect. Overexpression of the α-helix tagged with GFP led to less number of endogenous MT-associated SEPT2 filaments. This phenotype was rescued when the positively charged residues of the α-helix were mutated to alanine. These results indicated that the α-helix domain may mediate the interaction of SEPT2 with MTs. However, full length SEPT2 and the alpha-helical domain failed to interact with soluble alpha-/beta-tubulin using in vitro binding assay. On going experiments aim at investigating the potential role of SEPT9 in mediating the interaction of SEPT2 with microtubules.

Row: C Poster Number: 23 Judging Time: 12:30-2

Presenter: Donna Blackney Beckett Email: dmb98@drexel.edu
Major: Chemistry Academic Field: Chemistry
Faculty Advisor: Joe P. Foley Email: jpf26@drexel.edu

Evaluation of Dual-Opposite Injection Capillary Zone Electrophoresis Using a Conventional Capillary Length and Unmodified Cartridge

Author(s): Donna Blackney Beckett

Dual-opposite injection capillary zone electrophoresis (DOI-CZE) is a method of dual sample introduction and separation in capillary electrophoresis that has no bias in resolution and analysis time that is used for the simultaneous separation of anions and cations [1]. In previous research, the cartridge of a capillary was modified to allow a longer capillary length at the outlet to improve the separation of anions traveling toward the detector from the cathodic end of the capillary. In this study, a DOI-CZE separation is achieved using a standard cartridge and capillary length. The precision of DOI-CZE separations is evaluated and compared with the precision of CZE separations using the same capillary/cartridge and DOI-CZE separations with the longer capillary in terms of migration times, resolution, and peak areas.
[1] Brian S. Weekley and Joe P. Foley. Electrophoresis, 2007, 28, 697-711.

Row: E Poster Number: 48 Judging Time: 11-12:30

Presenter: Zachary Boles Email: zmb24@ncsu.edu
Major: Biology (Paleontology) Academic Field: Biological Sciences
Faculty Advisor: Daniel Ksepka Email: dtksepka@ncsu.edu

Quantifying Shifts in Osteosclerosis in the Humerus of Fossil Penguins (Aves: Sphenisciformes)

Author(s): Zachary Boles, Daniel Ksepka

Penguin wing bones exhibit substantial modifications in gross morphology and microstructure associated with the transition to flightless wing-propelled diving. One derived feature is the extreme reduction of the marrow cavity in the humerus, presumably related to demands for neutral buoyancy. In this study, we attempt to reconstruct the transition from the hollow humerus ancestral for living birds to the osteosclerotic humerus of penguins by quantifying properties of this bone for a range of stem and crown fossil penguins as well as extant ingroup and outgroup species. Thin-sections through the midshaft were created using standard histological techniques. The Cortico-Diaphyseal Index (CDI), a measure of cortical thickness independent of body size, was calculated as a proxy of density. CDI values ranged from 0.5349 for a basal Eocene penguin species from Seymour Island to 1.4359 for the extant Aptenodytes. When ancestral CDI values are reconstructed using Mesquite, a clear trend in increasing density along the lineage leading from the basal node in Sphenisciformes to crown Spheniscidae is observed. This trend is supported whether all branch lengths are considered equal or are extrapolated from a time-calibrated cladogram with ghost lineages leading to each terminal taxon set to 1 Ma. Thus, we can infer that while basal penguins retained a less dense humeral cross-section, essentially modern levels of osteosclerosis arose within the penguin stem lineage by the early Miocene. The developmental processes underlying this transition remain uncertain in

the absence of growth series for stem penguins. Examination of additional skeletal elements may provide additional insight.

Row: P Poster Number: 126 Judging Time: 11-12:30

Presenter: Evan Boucher Email: eb65@drexel.edu
Major: Digital Media Academic Field: Biological Sciences
Faculty Advisor: Kenneth Lacovara Email: kjl24@drexel.edu

Digital Paleoart: Reconstruction and Restoration from Laser Scanned Fossils

Author(s): Evan Boucher

For over two centuries, paleontology has used imagery in order to help convey its ideas. This "paleoart" initially struggled to be accepted as a legitimate tool in science due to fears over scientific accuracy of reconstructions and restorations. At first, many restorations were made on the basis of poor fossil evidence, which resulted in too many artistic and scientific speculations becoming integrated into the artwork. With the 20th Century came the general acceptance of paleoart. Throughout the century it co-evolved with paleontology as new discoveries and ideas were founded. In the digital age, new technologies are being used not only for reconstructions and restorations, but for research purposes. Digital technologies, including three-dimensional digitizers and computer animation, can now be used to create more accurate restorations than ever before, based directly on three-dimensional digitized fossils. In order to push the limits of what is possible in 21st Century paleoart, a restoration of the extinct crocodylian, Thoracosaurus neocesariensis, was created, by starting with a relatively complete digitized fossil source. The rest of the animal's skeleton, its muscles, and outer skin were then restored, using techniques of computer animation, guided by the scientific literature and principles of comparative anatomy. Motion was used to depict the behavior of the animal, influenced by the biology of the restoration and observations of the animal's closest living relatives. The goal was to restore an animal with an unprecedented amount of scientific accuracy by blending the techniques of rigorous scientific research with state-of-the-art computer generated imagery.

Row: R Poster Number: 151 Judging Time: 12:30-2

Presenter: Jonathan Bowen Email: bowen@drexel.edu
Major: Biology Academic Field: Biological Sciences
Faculty Advisor: Elias Spiliotis Email: ets33@drexel.edu

Septin 2 Guides the Spatial Organization of the Epithelial Microtubule Network

Author(s): Jonathan Bowen, Daniel Hwang, Xiaobo Bai, Dheeraj Roy, Elias Spiliotis

Spatial organization of the microtubule (MT) network is essential for the establishment and maintenance of epithelial cell polarity. Little is known about the mechanisms that organize the spatial distribution of epithelial MTs. Previous studies have shown that septin 2 (SEPT2) associates with subsets of microtubules, but the precise role of SEPT2 in MT organization and dynamics is unknown. Here, we show that in polarizing Madin-Darby canine kidney (MDCK) epithelia, there are two populations of SEPT2 filaments: perinuclear SEPT2 filaments that colocalize exclusively with linear MT bundles, which run parallel to the long axis of the cell, and short SEPT2 fibers that overlap with MTs near sites of focal adhesion. Time lapse microscopy of MT plus ends revealed that MT plus ends track along perinuclear and peripheral SEPT2 filaments. SEPT2 depletion or over-expression of a dominant negative SEPT2 construct resulted in loss of perinuclear MT bundles and significant bending of peripheral MTs. In these cells, the trajectories of MT plus ends were highly entangled exhibiting an increased number of lateral movements. Quantification of MT plus end dynamics revealed that in the absence of SEPT2, MTs were more prone to catastrophe. Taken together these results suggest that SEPT2 guides the spatial organization and movement of MTs during epithelial polarization. Indeed, the apicobasal distribution of MTs was significantly altered in confluent monolayers of SEPT2-depleted epithelia. We propose that SEPT2 is involved in the capture and movement of MTs at intracellular sites of MT nucleation and targeting.

Row: Q Poster Number: 136 Judging Time: do not judge? (technician)

Presenter: Shanthi Bradley Email: sbradley26@gmail.com
Major: MCBG Academic Field: Biological Sciences
Faculty Advisor: Daniel Marenda Email: dm562@exchange1.drexel.edu

Reduced Mitochondrial Transcription Factor A (TFAM) Activity May Be The Causal Molecular Event Setting Off the Primary Mitochondrial Pathology Resulting in Sporadic Alzheimer's Disease

Author(s): Shanthi Bradley

Alzheimer's Disease (AD) is a progressive neurodegenerative disease of aging. AD is characterized by senile or presenile dementia, extracellular amyloid protein aggregations containing an insoluble amyloid precursor protein derivative, and intracytoplasmic tau protein tangles. Mitochondrial dysfunction leads to increased production of reactive oxygen species (ROS) which are detrimental to neurons. The Mitochondrial Cascade hypothesis1 suggests that the inherited, gene-determined make-up of an individual's electron transport chain sets basal rates of ROS production, which determines the pace at which acquired mitochondrial damage accumulates. Mitochondrial Transcription Factor A (TFAM) is essential for transcription and replication of mitochondrial DNA, and mutations in TFAM has been associated with late onset AD. Based on this premise, I propose a close

relationship between TFAM's reduced activity and mitochondrial dysfunction which then triggers the neurodegeneration in AD. Preliminary experiments such as behavioral, longevity assays, and brain morphology were performed by introducing TFAM RNAi gene into flies with AD background expressing both hAPP and hBACE. The data did indicate a significant enhancement of the disease. Based on these data, it is worthwhile to further explore the role TFAM may have on mitochondrial impairment and on AD pathology
1 Swerdlow, R. H and Khan, S. M. A "mitochondrial cascade hypothesis" for sporadic Alzheimer's disease. Medical Hypotheses (2004) 63, 8–20

Row: I Poster Number: 75 Judging Time: 11-12:30

Presenter: Stephanie Brooks-Holliday Email: stephanie.b.holliday@gmail.com
Major: Psychology Academic Field: Psychology
Faculty Advisor: Kirk Heilbrun Email: kirk.heilbrun@drexel.edu

Teen Courts: Are They Truly Effective?

Author(s): Stephanie Brooks-Holliday

Over the past two decades, the popularity of Teen Courts (or Youth Courts) has grown significantly as an alternative to the juvenile justice system. Whereas in 1994 there were only 78 known teen courts, as of 2010 there were more than 1,050 teen courts in operation (National Association of Youth Courts, 2010). The majority of these courts target first-time youth offenders, and institute sanctions such as community service, letters of apology to victims, restitution payments, and serving on future teen court juries (Butts and Buck-Willison, 2002). These programs aim to prevent recidivism, but also to apply "positive peer pressure," decrease the juvenile court workload, and increase legal-related knowledge among those youth in the program (Harrison, Maupin, and Mays, 2001). However, there has been limited systematic research examining Teen Courts. Outcome measures differ across studies, and several studies lack a control of comparison groups. This poster attempts to summarize the current state of the literature related to the effectiveness of teen courts.

Row: C Poster Number: 25 Judging Time: 12:30-2

Presenter: Lei Cao Email: cl428@drexel.edu
Major: Mathematics Academic Field: Mathematics
Faculty Advisor: Hugo J. Woerdeman Email: hugo@drexel.math.edu

The Uniqueness of Solutions to a Horn's Problem

Author(s): Lei Cao, Hugo J.Woerdeman

A. Horn's problem asks for Hermitian matrices A and B so that A,B and A+B have given spectrums respectively. We are exploring when the solution matrices A and B are unique up to unitary similarity. If all given spectrums are rational, we prove that uniqueness occurs exactly when there exist a unique Littlewood-Richardson function with given spectrums. When all spectrums are partitions, , we prove that the uniqueness of Littlewood-Richardson function can be replaced by requiring that the Littlewood-Richardson coefficient corresponding to given spectrums equals 1.

Row: G Poster Number: 66 Judging Time: 11-12:30

Presenter: Joseph Lambert Email: sac69@drexel.edu
Major: Physics Academic Field: Physics
Faculty Advisor: Roberto Ramos Email: rcr32@drexel.edu

Measurements of Multiple Gap Structure in MgB2 Below 1 Kelvin

Author(s): Steve Carabello, Joseph Lambert, Mariyan Stoyanov, Roberto Ramos

Superconductivity in magnesium diboride (MgB2) is of great practical interest because of its high superconducting transition temperature Tc of 39K (the highest among conventional superconductors), and its relatively low cost and relative ease of manufacturing. A full understanding of MgB2 requires study of its two superconducting energy gaps, which have been widely reported in both theoretical and experimental studies. However, some theoretical analyses and experimental results suggest substructure within both gaps - a result which remains controversial. Results of our tunneling spectroscopy experiments on MgB2/insulator/Pb Josephson junctions, at temperatures as low as 20 mK, are in clear agreement with theoretical predictions for this substructure.

Row: J Poster Number: 79 Judging Time: 11-12:30

Presenter: Shuyang Chen Email: csy@drexel.edu
Major: Biology Academic Field: Biological Sciences
Faculty Advisor: Nianli Sang Email: Nianli.Sang@drexel.edu

Histone Deacetylase 5: An important regulator of Hypoxia Inducible Factor -1α

Author(s): Shuyang Chen

Histone deacetylase inhibitors (HDACIs) have been explored as a new generation of chemotherapeutics for cancers, generally known as epigenetic therapeutics, interestingly,

accumulating evidence support that several types of HDACIs can repress angiogenesis by disrupting the function of hypoxia-inducible factors (HIF-1, HIF-2, and collectively, HIF), which are the master regulators of angiogenesis and cellular adaptation to hypoxia. My major aims are to find out which individual HDAC is involved in HDACI mediated regulation of HIF-1α and dissect the molecular mechanism of this process. My preliminary data has already shown that knocking down of Histone Deacetylase 5 (HDAC5) will significantly disrupt HIF-1α protein stability, which suggesting a way to understanding the HDACI-induced repression of HIF function.HDAC5, a member of the Class IIa Histone Deacetylases (HDACs), is a Zinc-dependant enzyme that localized both in nucleus and cytosol. HDAC5 is previous found highly related to myogenesis and vasculogenesis. My next step is to explore the full mechanism of this HDAC5 mediated regulation of HIF-1α, including the function of HDAC5 catalytic activity, protein-protein interaction, subcellular localization and signaling pathways in the whole process. Our finding may facilitate the development of future therapies to either repress or promote angiogenesis for cancer or chronic ischemic disorders, respectively.

Row: M Poster Number: 98 Judging Time: 11-12:30

Presenter: Ben Coy Email: btc24@drexel.edu
Major: Physics Academic Field: Physics
Faculty Advisor: Prof. Gilmore Email: robert.gilmore@drexel.edu

Reduction of UPOs in the EMR attractor Using Locally Linear Embedding

Author(s): Ben Coy

An autonomous four-dimensional dynamical system is investigated through a topological analysis. This system generates a chaotic attractor for the range of control parameters studied and we determine the organization of the unstable periodic orbits (UPOs) associated with the chaotic attractor. Surrogate UPOs were found in the four-dimensional phase space and pairs of these orbits were embedded in three-dimensions using Locally Linear Embedding. This is a dimensionality reduction technique recently developed in the machine learning community. Embedding pairs of orbits allows the computation of their linking numbers, a topological invariant. A table of linking numbers was computed for a range of control parameter values which shows that the organization of the UPOs is consistent with that of a Lorenz-type branched manifold with rotation symmetry.

Row: D Poster Number: 38 Judging Time: 11-12:30

Presenter: Avi Dalal Email: adalal@math.drexel.edu
Major: Mathematics Academic Field: Mathematics
Faculty Advisor: Jennifer Morse Email: morsej@math.drexel.edu

From Pascal's Triangle to Cores of k-Schur Functions in String Theory

Author(s): Avi Dalal

The study of important numbers is often connected to multiplying polynomials. A classical example is given by the binomial numbers which count the number of ways to choose k objects from a set of n objects. These numbers arise as coefficients when (x + y) is multiplied by itself n times. The unpleasant task of multiplying polynomials can sometimes be simplified and lead to beautiful descriptions for the associated numbers. It is Pascal's triangle that provides such a description for the binomial numbers.
Recently, important numbers called Gromov-Witten invariants arose in String Theory and Symplectic Geometry. Computing the numbers is a highly nontrivial task. It has been shown that certain Gromov-Witten invariants can be realized as a product of certain polynomials called k-Schur functions. It is now an open problem to find a simple method (as is given by Pascal's triangle for binomial numbers) to multiply k-Schur functions, and thus to obtain these numbers easily.
Here we give a new method for computing certain Gromov-Witten invariants and multiplying certain k-Schur functions. We are working to extend these results to solve the problem of computing Gromov-Witten invariants in general.

Row: A Poster Number: 4 Judging Time: 11-12:30

Presenter: Edward Damon Email: ead54@drexel.edu
Major: Physics Academic Field: Physics
Faculty Advisor: Jelena Email: jelena@physics.drexel.edu

Double Chooz Articulated Arm Calibration: Theory and Testing

Author(s): Edward Damon

Building and testing of the the Articulated Arm (AA) calibration device for the Double Chooz neutrino detection experiment is in its final phases. When completed, it will allow for full-volume calibration of the detector, a feat that cannot be performed by any other calibration device. This presentation discusses the current status and utility of the AA for neutrino detector calibration.

Row: L Poster Number: 92 Judging Time: 11-12:30

Presenter: Joseph DePasquale Email: jd538@drexel.edu
Major: Chemistry Academic Field: Chemistry
Faculty Advisor: Elizabeth Papish Email: ep322@drexel.edu

Catalytic Hydrogenation with Ru(II) N-Heterocyclic Carbene (NHC) Complexes

Author(s): Joseph DePasquale, Mukesh Kumar, Matthias Zeller, Elizabeth Papish

The Ru (II) complexes, [CH2(ImEt)2Ru(h6-cymene)Cl]PF6 (1) and (ImEt,CH2CH2OCH2CH3)(h6-p-cymene)RuCl2 (2) have been synthesized and characterized by X-ray crystallography and spectroscopic methods. Complex (1) contains a bis-N-heterocyclic carbene (NHC) ligand while complex (2) contains a monodentate NHC with a dangling ether group. Complexes (1) and (2) have been shown to be active hydrogenation and transfer hydrogenation catalysts for the reduction of carbonyl bonds. Preliminary mechanistic studies have been attempted and the formation of a Ru-H ligand in complex (1) has been observed by 1H NMR. Chiral imidazolium compounds have been synthesized and spectroscopic methods indicate that the chiral molecules have been successfully coordinated to Ru(II) as NHC ligands. Ru(II) compounds with chiral ligand systems may serve as enantioselective hydrogenation catalysts.

Row: O Poster Number: 120 Judging Time: 11-12:30

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

Development of Structural and Functional Water-soluble Metalloenzyme Mimics

Author(s): Natalie Dixon, Mukesh Kumar, Elizabeth Papish

The reactivity at the metal active-site in enzymes is best understood through the use of model systems. These studies suggest reaction pathways that can be synthetically reproduced for research purposes and for applications in industry, environmental sciences, and pharmaceutical technology. Our endeavor in the development of novel metalloenzyme model systems utilizes the newly developed tris(3,5-diisopropyl -1,2,4-triazolyl)hydroborate ligand (TtziPr2) and tris(3,5-diisopropyl -1,2,4-triazolyl)methane (TtzmiPr2)ligand. TtziPr2 and TtzmiPr2 reacted with zinc chloride, copper chloride and copper nitrate to form metal complexes TtziPr2ZnCl, TtziPr2CuCl, TtziPr2CuNO3 and TtzmiPr2CuNO3. These metal complexes have been characterized by appropriate techniques including 1H-NMR, IR, CI-MS, EA and/or X-ray crystallography.

Row: C Poster Number: 24 Judging Time: 11-12:30

Presenter: Lee Dolat Email: lcd48@drexel.edu
Major: Biology Academic Field: Biological Sciences
Faculty Advisor: Elias T. Spiliotis Email: ets33@drexel.edu

SEPT2 IS REQUIRED FOR FOCAL ADHESION MATURATION IN EPITHELIAL CELLS

Author(s): Lee Dolat, Elias. T Spiliotis

Septins comprise an evolutionarily conserved family of guanine nucleotide-binding proteins that assemble into oligomeric filaments. Abnormal septin expression has been implicated in several disease states including cancer. Overexpression of septins has been shown to promote cell migration and invasion. In previous studies, pharmacological targeting and knock down of septins have resulted in attenuation of cell motility. Septins associate with the actomyosin network and effectors of Rho signaling, but the precise role of septins in cell motility is unknown. Here, we show that in epithelial cells, septin 2 colocalizes with actin stress fibers and forms shorter, more punctate fibers near paxillin-enriched focal adhesions at the lamella-lamellipodia interface. Knockdown of SEPT2 in HeLa cells reduced both septin filament types and resulted in twice as many and more peripherally localized focal adhesions compared to control cells. To test whether SEPT2 affects focal adhesion turnover, wild-type and SEPT2-depleted HeLa cells were treated with nocodazole, which was subsequently washed out to assay for the disassembly of focal adhesions. SEPT2 depletion did not affect focal adhesion disassembly after nocodazole washout. However, enlargement of nascent adhesions was impeded. Our results indicate that SEPT2 functions at the level of focal adhesion maturation. We hypothesize that SEPT2 is critical in maintaining the tensile forces required for the maturation of focal complexes to focal adhesions. On-going studies aim at determining whether SEPT2 acts at the level of actin contraction and/or facilitates its tethering to nascent focal complexes.

Row: B Poster Number: 18 Judging Time: 11-12:30

Presenter: Abby Dominy Email: abbydominy@yahoo.com
Major: Environmental scienceAcademic Field: Biological Sciences, Environmental Science
Faculty Advisor: Harold Avery Email: haltort@aol.com

The Visual Ecology of the Diamondback Terrapin

Author(s): Abby Dominy, Walter Bien, James Spotila, Harold Avery

Throughout North America anthropogenic impacts threaten estuarine ecosystems via fragmentation by bulkheading, boat channels, and roads. The diamondback terrapin is a model vertebrate for determining impacts to North American estuaries because of its position as a top predator. A previous study in Barnegat Bay, New Jersey found that

fragmentation alters the mating system of diamondback terrapins by isolating groups and increasing risk of travel. In order to implement effective management strategies for estuaries and wildlife, we must learn more about the ecology of model organisms. The purpose of this research is to determine the importance of vision in estuarine vertebrates and how anthropogenic impacts may affect their visual ecology. Vision, like other senses, dictates how an organism perceives and interacts with its environment. Terrapins exhibit high intra-specific variation in their coloration and patterning, in both the near-UV and visible spectrums. Mate selection may be dependent on this variation, resulting in a small effective population size. We are quantifying coloration and patterning of individual terrapins using reflectance spectrophotometry and photographic pattern analysis. We are also determining successful mating pairs, relationships between their coloration and patterning, and paternity of offspring. Hatchling terrapins with known mothers will be genotyped and matched with the genotype of their father. We will also determine the visual ability of the terrapin by quantitatively modeling vision in both trichromatic and tetrachromatic color spaces. We are also using retinal and molecular analyses of photopigments to determine the ability of the terrapin to perceive light and color. Our preliminary results indicate that terrapins can see four components of color (R,G,B and UV). Terrapins reflect colors in the ultra-violet spectrum, suggesting cryptic signaling not visible to humans. Our study will determine whether variation in color and patterns of terrapins is a result of sexual selection, and whether estuary fragmentation has an impact on sexual selection in Barnegat Bay, NJ.

Row: M Poster Number: 100 Judging Time: 11-12:30

Presenter: Victoria Egerton Email: vme23@drexel.edu
Major: Biology Academic Field: Biological Sciences
Faculty Advisor: Kenneth Lacovara Email: lacovara@drexel.edu

Climatic and floral latitudinal gradients between Late Cretaceous South America and Antarctica: Paleobiogeographical implications for southern-most Gondwana

Author(s): Victoria Egerton, Christopher Williams

Extensive exposures of Cretaceous (144-65 Ma) strata in Argentina have yielded most of the known dinosaur taxa from the Southern Hemisphere. However, little is known about their environment. The Pari Aike Formation, in southern-most Patagonia (Argentina), yields unique dinosaurian, elasmobranch, testudine, and dipnoan fauna. The Pari Aike Formation is notable because it is the southernmost Late Cretaceous site with both floral and faunal components preserved. Throughout the Cretaceous, South America and the Antarctic Peninsula shared a continental-continental plate boundary. It is not clear whether this connection was subaerial, covered by an epeiric sea, or whether it alternated between these states. Limited terrestrial vertebrate data is available to examine the

paleobiogeographic relationship between Late Cretaceous Antarctica and South America. However, fossil wood spans both of these locations and provides a potentially useful tool for understanding vertebrate paleoenvironments and paleobiogeography.
To assess the usefulness of fossil wood, we collected and sectioned samples from the Pari Aike Formation (Argentina). The relative abundance of gymnosperm wood is 73% versus 20% for angiosperms. The closest published Late Cretaceous locality is in the Antarctic Peninsula. Putatively coeval floras from the Antarctic Peninsula have distinctly different relative abundances: ~25% gymnosperm wood versus ~75% angiosperm wood. These differences suggest that these two regions did not share a homogeneous flora. Despite the equable Late Cretaceous climate, this research points to the possibility of climatic and floral latitudinal gradients along the relatively short continental connection between South America and Antarctica.

Row: H Poster Number: 71 Judging Time: 11-12:30

Presenter: Yuxiang Fei Email: yf65@drexel.edu
Major: Environmental Science Academic Field: Environmental Science
Faculty Advisor: James R. Spotila Email: spotiljr@drexel.edu

Metabolism and Radio Telemetry Studies to Support Reintroduction of the Giant Panda in China

Author(s): Yuxiang Fei, Katelyn E. Walsh, Hou Rong, Harold W. Avery, Edward A. Standora, Sheri Yi, Benjamin Kilham, James R. Spotila

The giant panda, Ailiropoda melanoleuca, is highly endangered and only 1500 exist in the wild. A major effort is underway at the Research Base for Giant Panda Breeding in Chengdu, China to produce 300 giant pandas through captive breeding to ensure a secure breeding population for this species. Studies are now underway to prepare to reintroduce giant pandas back into their native habitat. Researchers from Drexel University, State University College at Buffalo, and Global Cause Foundation are cooperating with researchers at the Panda Base to carry out basic research in support of this effort. Measurements of cyanide levels in bamboo indicate that amounts vary between species and that pandas prefer bamboo with low levels of cyanide. Pandas also metabolize the cyanide and excrete thiocyanide in their urine. Future studies will measure the metabolic rates of 1 year old pandas and older juveniles in the laboratory in chambers using O2 and CO2 meters and metabolism of juveniles and adults under semi-natural conditions using double labeled water. Ongoing studies of behavior will indicate new methods of training pandas to be rerintroduced into the wild. New radiotelemetry systems will track the pandas' progress in a multi-hectare natural enclosure as a first step towards reintroduction.

Row: D Poster Number: 34 Judging Time: 11-12:30

Presenter: Manuel Figueroa Email: maf69@drexel.edu
Major: Biomedical Engineering Academic Field: Physics
Faculty Advisor: Som Tyagi Email: tyagi@drexel.edu

Detection of Hyaluronic Acid on a Functionalized Surface Enhanced Raman Scattering Substrate

Author(s): Manuel Figueroa, Kambiz Pourrezaei, Som Tyagi

Hyaluronic acid (HA) is a high molecular weight glycosaminoglycan found in the extracellular matrix and joints of the body. Elevated levels in the serum are associated with liver cirrhosis making it an important biomarker for early diagnosis and the monitoring of its progression. Conventional methods can measure HA in the microgram per milliliter range but they take several days and require multiple preparation steps. Surface-enhanced Raman scattering (SERS) could serve as an alternative as it yields specific signatures stemming from molecular vibrations and has been shown to provide large enhancement factors. SERS is a surface detection technique so it requires HA to come in close proximity to the nanoparticles. However, due to its intrinsic negative charge HA does not readily adsorb to metallic surfaces. To overcome this, a functionalized SERS substrate was developed to immobilize HA. A cysteamine self-assembling monolayer in the trans conformation allows the HA carboxyl group to attach to the ligand's amine group. The SERS signal can be used to monitor the concentration of cysteamine trans conformers in order to optimize HA attachment. In addition, SERS analysis shows an increase in HA Raman band intensity when immobilized to the substrate as compared to free HA on the substrate. Correlations between HA concentration and Raman band intensity are also discussed. With this technique HA was detected at concentrations one order of magnitude lower than previous SERS studies and with a shorter collection time.

Row: O Poster Number: 118 Judging Time: 11-12:30

Presenter: Alina Freire-Fierro Email: freirefierro@ansp.org
Major: Environmental SciencesAcademic Field: Biological Sciences, Environmental Science
Faculty Advisor: Walter F. Bien Email: wbien205@comcast.net

Systematics of Monnina (Polygalaceae)

Author(s): Alina Freire-Fierro, James R. Spotila, Jacob A. Russell, Laurence J. Dorr, Alfred E. Schuyler, Susan S. Kilham, Walter F. Bien

Monnina (Polygalaceae), a monophyletic genus of ca. 234 species, is morphologically diverse. This research will develop robust hypotheses regarding the biogeography and phylogenetic relationships of this important element of the Neotropical montane flora using morphological and molecular approaches. Morphological variability will be assessed

through the analysis of 100 morphological characters from ca. 200 herbarium specimens corresponding to 95 species. Phylogenetic hypotheses also will be based on molecular data and DNA from collections recently made in Panama was successfully extracted and amplified. Material from previously hypothesized sister genera (e.g. Polygala, Comesperma, and Securidaca), together with specimens from 95 Monnina species from Costa Rica, Mexico and the rest of Central America and South America will be sampled. The cpDNA markers trnL-trnF, matK, and ndhF-rpl32 have been successfully used with Polygalaceae. Nuclear genes (low copy and/or ITS) will be tested if cpDNA markers are not informative at the infrageneric level. The molecular sequences will be analyzed with Clustal W, and phylogenies will be inferred through parsimony and Bayesian statistics. This research will help us understand the origin and diversification of an ecologically important component of Neotropical montane forests. Further ecological studies would be important for the conservation of Monnina.

Row: E Poster Number: 53 Judging Time: 12:30-2

Presenter: Lauren Greenberg Email: LMG42@drexel.edu
Major: Clinical Psychology Doctoral program Academic Field: Psychology
Faculty Advisor: Arthur M. Nezu Email: amn23@drexel.edu

Problem Orientation as a Mediator of Affectivity in College Athletes

Author(s): Lauren Greenberg, Arthur M. Nezu, Ph.D., ABPP, Christine Maguth Nezu, Ph.D., ABPP

College athletes strive to be in peak physical condition, which may overshadow mental health problems. Little is known about the psychological experience of stress in this population. Social problem solving (SPS) is the cognitive-behavioral process by which a person attempts to identify adaptive solutions for specific problems encountered in everyday life. Deficits in SPS have been associated with various reports of negative affect in diverse populations. The current study investigated the relationship between SPS and negative affect in a novel population, college student-athletes. It was hypothesized that problem solving would mediate the relationship between stress and negative affect among college student-athletes. One hundred and twenty-two student-athletes (55% female; 87.7% white, 5.7% black, 3.3% multiracial, 1.6% Hispanic, 0.8% Asian, 0.8% other; mean [SD] age= 19.80 [1.45] years, range= 18-23) were recruited from a NCAA Division I university. Researchers collected data from three self-report measures: SPSI-R:S, LESCA, and the PANAS. Mediational effects were examined using a regression analysis followed by Sobel (1982) tests. An initial regression analysis found stress significantly predicted negative PANAS scores (B = .18, SEB = .03; 95% CI = .11 to .24; t = 5.24, p < .001). Then Sobel (1982) tests were performed to directly test the significance of the predicted mediational effect of problem-solving dimensions. Overall, results of the Sobel tests indicated that only the NPO variable was found to be a significant mediator of the stress-

affect relationship (p = .004), which is consistent with previous literature highlighting the role of NPO.

Row: M Poster Number: 97 Judging Time: 12:30-2

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

Magnification Effects Of A Finite Source Applied To A Fold Lens Configuration

Author(s): Austen Groener

Gravitational lensing is one of the most stunning confirmations of Einstein's theory of general relativity. In the most extreme cases, distant objects like quasars can be lensed by the mass of nearby galaxies to produce configurations of multiple images. In particular, we focus on the "fold" lens configuration, where two of the images, mirror images of each other, lie very close to one another across a critical curve. Since the entire galaxy's mass affects the magnification of the images, the flux ratio of the pair can be used as a tool for investigating substructure.

In the absence of substructure, we would naively expect the two images to be of equal brightness. However, 'anomalous' (non-zero) flux ratios seem to be observationally common. Possible reasons for this are microlensing, differential absorption by dust, and galaxy substructure. However, we look at yet another possibility, and one that will allow us to use the lensing galaxy as a microscope: the finite size of the background quasar.

In the present work, we develop a semi-analytic expression for the magnification of images in a multiple-image lens system in which higher order lensing effects are taken into account. How the flux ratios will be affected by source size and positions using this expression will need to be further assessed. In particular, we plan to study where and when the flux ratio deviates from zero for fold lenses. This will ultimately allow us to model the radial color distribution in quasars, allowing new insights into their structure.

Row: G Poster Number: 63 Judging Time: 12:30-2

Presenter: Kyle Haggerty Email: krh42@drexel.edu
Major: Psychology Academic Field: Psychology
Faculty Advisor: Christine M. Nezu Email: cmnezu@verizon.net

Traumatic Brain Injury and its Relationship with Executive Functioning and Social Problem Solving

Author(s): Kyle Haggerty

Traumatic brain injury affects the lives of millions of Americans and costs billions of dollars. This makes it an important task for researchers to gain an understanding of variables that are related to traumatic brain injury and social outcomes in patients who have suffered one. This study reviews the research literature in an attempt to gain an understanding of variables that have been identified as strong predictors of social outcomes in this population. This proposed study then seeks to replicate the findings of some of the research, specifically that social problem solving mediates the relationship between executive functioning and community integration within a TBI population. It will also be examined if social problem solving is significantly related to the quality of life of TBI patients.

Row: Q Poster Number: 144 Judging Time: 11-12:30

Presenter: Jeffrey Holt Email: jph38@drexel.edu
Major: Biology Academic Field: Biological Sciences
Faculty Advisor: Jennifer Quinlan Email: jjq26@drexel.edu

Identification of Three Campylobacter jejuni Mutants with Reduced Virulence

Author(s): Jeffrey Holt, Andrew J. Grant, Christopher Coward, Duncan J. Maskell, Jennifer J. Quinlan

Campylobacter jejuni is an important human intestinal pathogen and the second leading cause of foodborne illness in the US, yet little is known about its virulence mechanisms when compared to other enteric pathogens. Identification and characterization of C. jejuni virulence mechanisms is needed to aid in the development of interventions and treatments to mitigate disease caused by this pathogen. Random transposon mutants were created in C. jejuni NCTC11168 using a signature-tagged mutagenesis system previously developed. Virulence was determined using the gentamicin protection cell invasion assay with the Caco-2 cell line. Motility was measured by diameters of soft agar stabs. Growth curves were performed in T75 flasks in Mueller Hinton (MH) broth measured by dilution plate counts. A total of 1170 transposon mutants were tested. Three of these mutants displayed a red phenotype when grown on MH Agar. The genes disrupted in the three mutants were determined to be Cj0390, Cj0469, and Cj1365c. All three mutants displayed a significant decrease in Caco-2 invasion relative to the wild type: dCj0390 222-fold, dCj0469 37-fold, and dCj1365c 27-fold. Both dCj0469 and dCj1365c were fully motile but dCj0390 was non-motile. All three mutants had similar growth characteristics to the wild type strain. This research identified three genes not previously reported to be involved in C. jejuni virulence which also share the red growth phenotype. Further investigation into the role these genes play in C. jejuni virulence will contribute to a greater understanding of C. jejuni and its mechanisms of infection.

Row: O Poster Number: 115 Judging Time: 12:30-2

Presenter: Travis Hoppe Email: hoppe@drexel.edu
Major: Physics Academic Field: Physics
Faculty Advisor: Jian-Min Yuan Email: hoppe@drexel.edu

Protein Folding with Implicit Crowders: A Study of Conformational States Using the Wang–Landau Method

Author(s): Travis Hoppe

We introduce the idea of the implicit crowding method to study the statistical mechanical behaviors of folding of beta-sheet peptides. Using a simple bead-lattice model, we are able to consider, separately, the conformational entropy involving the bond angles along the backbone and the orientational entropy associated with the dihedral angles. We use a Ising-like model to partially account for the dihedral angle entropy and, implicitly, the hydrogen-bond formations. We also compare our results to recent experiments and find good quantitative agreement on the predicted folded fraction. On the basis of the predictions from the scaled particle theory, we investigate changes in the melting temperature of the protein, suggesting crowding enhanced stability for a variant of trpzip hairpin and a slight instability for the larger beta-sheet designed proteins.

Row: Q Poster Number: 143 Judging Time: 12:30-2:00pm

Presenter: Yi Hu Email: yh332@drexel.edu
Major: Biology Academic Field: Environmental Science
Faculty Advisor: Jacob Russell Email: jar337@drexel.edu

Assessing the diversity and stability of gut bacteria in Cephalotes varians

Author(s): Yi Hu, Corrie Moreau, Jacob Russell

Ants are ecologically dominant insects that are known to occupy most of the Earth's terrestrial biomes. They have a variety of diets ranging from relatively balanced to extremely unbalanced in nutrient content. It has been hypothesized that several groups of ants have evolved herbivorous diets with the aid of nutritional gut symbionts and they have evolved means to favor the transmission and maintenance of these potentially beneficial microbial gut flora. In this study, we aimed to explore the diversity and stability of gut associates in Cephalotes varians, an herbivorous ant from the Florida Keys. To

accomplish this, we used a culture-independent approach to study bacterial gut communities through the use of the 16S rRNA gene. We used 454 pyrosequencing to explore variation in gut bacteria within and between colonies and across developmental stages. We explored the effects of varying diets on gut microbes of ants from a single colony, using a more affordable method known as T-RFLP. T-RFLP analyses of the 16S rRNA gene revealed high similarity between gut microbes in different ants, even those fed on different diets. However, there was a weak tendency for microbes to differ between diets with and without amino acids. Our 454 pyrosequencing data showed a trend of greater similarity of microbial gut communities within (versus between) ant colonies. However, the predominant bacterial taxa from adult workers were found across all colonies. In addition, the microbial gut bacteria differed drastically between adults and larvae, suggesting different modes of acquisition at these developmental stages or different roles in metabolic processes that may relate to differences in adult and larval diets.

Row: R Poster Number: 149 Judging Time: 11-12:30

Presenter: Frank Jones Email: fj38@drexel.edu
Major: Physics Academic Field: Physics
Faculty Advisor: 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 (non-disease) aging in the brain can be characterized by impairments in memory and executive function. These impairments usually start developing in healthy people in their early twenties and progressing linearly until old age. This is usually labeled as the “normal” effects of age. The precise nature of these effects in the brain, however, are not known. Extensive studies have shown that neurons are not lost with age, in contrast with other neurodegenerative diseases such as Alzheimer's disease. In a previous joint computational and anatomical study, it was found that neurons in aged brains suffered from a loss of organization when compared with young subjects. This meant that neurons that are typically organized in anatomical structures known as microcolumns, would lose their columnar organization due to random small displacements of their positions. The current hypothesis is that the dendrites that surround and in a way support the neurons suffer atrophy with age. In this work we present a method to assess this atrophy from digital immunostained photomicrographs of brain tissue samples. By applying a wavelet transforms 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 neurons and cognitive impairment. A correlation between results from our wavelet transform method and the more time-consuming acquisition of data by measuring by hand will be presented as a validation of

our method. By exploiting the parallel nature of image analysis, an NVIDIA CUDA implementation of our wavelet transform will be presented in which hardware acceleration increases execution by up to ten orders of magnitude.

Row: C Poster Number: 31 Judging Time: 11-12:30

Presenter: Timothy Jones Email: tdj28@drexel.edu
Major: Physics Academic Field: Physics
Faculty Advisor: Robert Gilmore Email: bob@bach.physics.drexel.edu

Reconstructing Dynamical Curves with Evolutionary Computing

Author(s): Timothy Jones

In the field of nonlinear dynamics, the usual course of investigation is to start with a known dynamical system and investigate its properties. If a nonlinear system in nature is found, a first course for investigatorsis to try to fit the behavior of this system to a known template. On rare occasion, when no such template matches, a clever researcher may develop a model that closely fits the data. The development of new models of complex chaotic systems is not common, and the infinite variations of nonlinear systems implies that the reliance on the occasional researcher to apply his or her talents towards developing new models to fit each system is an impractical course for a program of nonlinear dynamics research.
Ideally, we would want to make the construction of new dynamical models that fit discovered chaotic systems to be systematic and easy to replicate. Computational programs would be the natural candidate for such progress. Such a course has met with very limited success in the past few decades of research. In this poster, we take a close look at the field of "evolutionary computing" and apply its methods to the reconstruction of dynamical equations for noisy sample systems.

Row: H Poster Number: 74 Judging Time: 12:30-2

Presenter: Michael Keesler Email: mek68@drexel.edu
Major: Psychology Academic Field: Psychology
Faculty Advisor: David S. DeMatteo Email: dsd25@drexel.edu

Psychopathy, Sociopathy, and Antisocial Personality Disorder: Definitions and Conceptualizations across Time and Context

Author(s): Michael Keesler

Since first identified by Philippe Pinel in 1801 and defined by Hervey M. Cleckley in 1941, the construct of Psychopathy has undergone much change in its contemporary history. Confusion and disagreement also persists in the professional and lay communities regarding the overlap or differentiation of Psychopathy, Sociopathy, and Antisocial Personality Disorder. Whereas one camp insists that each is a separate construct, another identifies them as a singularity by different names, while still a third perceives Psychopathy and Sociopathy as a subset falling under the umbrella of Antisocial Personality Disorder. Intermingled amongst this is speculation that public perception of Psychopathy has evolved – shifting from envisioning the blood-lusting serial killers like Jack the Ripper to a more intelligent, fascinating, but misunderstood individual like television's House, M.D. These different definitions, conceptualizations, and perceptions are explored in greater detail.

Row: E Poster Number: 50 Judging Time: 11-12:30

Presenter: Sam Kennerly Email: samkennerly@yahoo.com
Major: Physics Academic Field: Physics
Faculty Advisor: Robert Gilmore Email: robert.gilmore@drexel.edu

Decoherence of Qubits Exposed to Random Magnetic Fields

Author(s): Sam Kennerly

A qubit is a quantum-mechanical system with exactly two energy levels. Design and control of stable qubits are central goals of quantum computing research. Laboratory qubits maintain the information stored in them for short periods of time before decaying. This phenomenon, called decoherence, is of practical and theoretical interest.
Decoherence models often begin by approximating the interactions between a qubit and its environment. We consider a simpler description in which these interactions are represented by random numbers. In this description, the time-evolution of a qubit is a stochastic process whose outcome can only predicted statistically. Density matrix theory can be used to represent these statistical results as "mixed states."
We present a preliminary model in which a qubit is subjected to a stray magnetic field of random strength and duration. Exact calculations predict decay to a mixed state which resembles the equilibrium state predicted by quantum thermodynamics. The results are qualitatively similar to experimental data, but important quantitative errors remain.

Row: QR Poster Number: 135 Judging Time: 12:30-2:00

Presenter: David Kimsey Email: dpk27@drexel.edu
Major: Mathematics Academic Field: Mathematics
Faculty Advisor: Hugo Woerdeman Email: hugo@math.drexel.edu

The truncated matrix-valued K-moment problem

Author(s): David Kimsey, Hugo J. Woerdeman

Given a nonempty set K and a finite multisequence, indexed by a certain family of finite subsets of tuples of nonnegative integers, of Hermitian matrices we obtain necessary and sufficient conditions for the existence of a minimal finitely atomic representing measure for the given finite multisequence. In addition, our result admits an algorithm to construct the measure. In particular, our result can handle the case when the indexing set that corresponds to the indices of an odd total degree.

Row: G Poster Number: 70 Judging Time: 11-12:30

Presenter: William King Email: wking@drexel.edu
Major: Physics Academic Field: Physics
Faculty Advisor: Guoliang Yang Email: gy24@drexel.edu

Flexible parallel execution and packaging of simulation software

Author(s): William King

Single molecule mechanical unfolding (also known as force spectroscopy) has become a fairly common approach to studying protein behavior over the last decade. Despite the relatively well-established nature of the methods and analysis procedures, many labs use unpublished, in-house software for these fundamental tasks. In previous work, we developed the open source simulation Sawsim for running Monte Carlo unfolding simulations. Many analysis tasks depend on large numbers of Sawsim simulations which may be executed in parallel. In order to support Sawsim across the common paralization technologies, we have developed a flexible Python framework with pluggable backends for each technology. We present this framework, and discuss the related task of packaging Sawsim using Gentoo ebuilds so that users may easily install it and keep abreast of subsequent improvements and bug fixes.

Row: N Poster Number: 103 Judging Time: 12:30-2

Presenter: Arben Kojtari Email: ak865@drexel.edu
Major: Chemistry Academic Field: Chemistry
Faculty Advisor: Haifeng Ji Email: hj56@drexel.edu

Computer-assisted drug design for the development of novel prostate-specific antigen inhibitors using molecular docking

Author(s): Arben Kojtari

Structure-based drug design is an avenue in medicinal chemistry that is currently being explored as a plausible method of developing novel drug compounds. This method is based on a three-dimensional structure of a target protein, such as prostate-specific antigen (PSA), which is a chymotrypsin-like protease with suggested links to prostate cancer. The goal of this work is high-throughput analysis of numerous compounds within a chemical library on a specific target using molecular docking to identify lead compounds as possible inhibitors for PSA Currently, analogs of peptidyl diphenyl phosphonate esters are being evaluated using the molecular docking algorithm LigantFit as a virtual screening method to identify candidate inhibitors for synthesis.

Row: B Poster Number: 16 Judging Time: 11-12:30

Presenter: Selcuk Koyuncu Email: sk476@drexel.edu
Major: Mathematics Academic Field: Mathematics
Faculty Advisor: Hugo J. Woerdeman Email: hugo@math.drexel.edu

The Inverse of a Two-level Positive Denite Toeplitz Operator Matrix

Author(s): Selcuk Koyuncu, Hugo J. Woerdeman

The Gohberg-Semencul formula allows one to express the entries of the inverse of a Toeplitz matrix using only a few entries (the first row and the first column) of the matrix, under some nonsingularity condition. In this talk we will provide a two variable generalization of the Gohberg-Semencul formula in the case of a positive definite two-level Toeplitz matrix with a symbol of the form 1/|p|^2 where p is a stable polynomial of two variables. We also consider the case of operator valued two-level Toeplitz matrices. In addition, we propose an approximation of the inverse of a multilevel Toeplitz matrix with a positive symbol, and use it as the initial value for a Hotelling iteration to compute the inverse. Numerical results are included.

Row: M Poster Number: 102 Judging Time: 11-12:30

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

Radio-Quieter: Using Stacking Techniques to Search for Radio Silence Amongst Known Quasars

Author(s): Rachael Kratzer, Gordon T. Richards

Despite the debate 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 SDSS quasars undetected by FIRST, we search for possible radio-silence amongst various sub-samples with different broad emission line properties. Specifically, we find that the combination of two parameters of the CIV emission line (the equivalent width and the "blueshift") can be used to determine the ionizing spectrum ofindividual quasars. Quasars with strong CIV are seen to have hard (ionizing) SEDs, while quasars with large blueshifts are seen to have softer SEDs. The shape of the SED depends on fundamental parameters such as mass, accretion rate, and spin; radio-loudness may be dependent on these parameters. As such, our CIV emission line parameter space affords a unique way to probe the radio properties of quasars. We predict that those radio-quiet quasars with the least ionizing spectra will have very different median stacked peak flux values than radio-quiet quasars with hard ionizing spectra. 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 fresh new insight to a frustratingly stagnant problem.

Row: P Poster Number: 132 Judging Time: 12:30-2pm

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

Bolometric Corrections as a Function of Ionizing Spectra for SDSS-Selected Quasars

Author(s): Coleman Krawczk, Gordon Richards

We explore the spectral energy distribution (SED) for up to 100,000 SDSS-selected quasars using mid-IR data from Spitzer, near-IR data from 2MASS and UKIDSS, optical data from SDSS, and UV data from GALEX. We consider the problem of determining bolometric corrections for individual quasars as opposed to the ensemble average. Significant differences can arise due to the fact that even the best observed SEDs have a gap of nearly 2 decades in frequency between the UV and X-ray. We particularly consider the dependence

of the bolometric correction on the UV luminosity and the properties of the CIV emission line. The latter can be used to distinguish between hard-spectrum radio-quiet quasars and soft-spectrum radio-quiet quasars, which can have very different bolometric corrections for the same UV luminosity and thus different Eddington ratios.

Row: N Poster Number: 105 Judging Time: 12:30-2

Presenter: Joseph Lambert Email: jgl29@drexel.edu
Major: Physics Academic Field: Physics
Faculty Advisor: Roberto Ramos Email: rcr32@drexel.edu

Characteristic Current-Voltage Measurements of Graphene-based Josephson Junctions

Author(s): Joseph Lambert, Steven Carabello, Mariyan Stoyanov, Roberto Ramos
In the last several years, graphene has become a ubiquitous material in many fields of science and engineering due to its unique physical and electrical properties and the recently discovered straightforward methods of isolation. It is a truly 2-dimensional material made of an atom-thick sheet of carbon atoms arranged in a repeating hexagonal pattern. We report on the isolation and characterization of single layer flakes of graphene and on the fabrication of superconducting devices called Josephson junctions. Specifically, these devices consist of a single-layer graphene flake contacted by two superconducting parallel leads separated by a few hundred nanometers. When the device is lowered to temperatures below the superconducting transition temperature (~1 Kelvin for aluminum), we observe a characteristic junction current-voltage curve with a sub-gap region. With sensitive, low-noise measurement techniques, we are able to extract the differential conductance and analyze the sub-gap structure. In addition to the fabrication of these devices, we report on the measurement techniques, and analysis of recently collected current-voltage measurements at temperatures as low as 25 mK.

Row: OP Poster Number: 134 Judging Time: 12:30-2pm

Presenter: Christy Lane Email: lanechristy@gmail.com
Major: Clinical Psychology Academic Field: Psychology
Faculty Advisor: Naomi Goldstein Email: lanechristy@gmail.com

Ethical decision-making in juvenile justice research: Consent and confidentiality

Author(s): Christy Lane, Dan Pennacchia, Meghann Kelly, Jessica Golden, Naomi E. S. Goldstein

Although ethical decision-making occurs during many research studies, researchers who work with juvenile offenders face special challenges. Researchers are guided by federal regulations and ethical principles; however, situations often arise that require judgment and the balancing of multiple concerns. Laws and ethics, participants' rights, clinical concerns, relationships with participants and juvenile justice staff, the research protocol, and the safety of participants and researchers affect decision-making in research protocols with juvenile offenders. This paper will discuss dilemmas that can occur during the informed consent process and when protecting a participant's confidentiality. Recommendations will be presented to resolve these situations.

Row: B Poster Number: 17 Judging Time: 12:30-2

Presenter: Alexa Murray Email: nrl33@drexel.edu
Major: Biology Academic Field: Biological Sciences
Faculty Advisor: Jennifer Quinlan Email: jjq26@drexel.edu

Identification, Isolation and Characterization of Random Campylobacter jejuni Mutants Displaying a Red Phenotype

Author(s): Natalie Launchi, Alexa Murray, Jeff Holt, Jennifer Quinlan

Campylobacter jejuni is one the leading bacterial agents causing human intestinal disease. This foodborne pathogen is most prevalent in young children and in underdeveloped countries. Surprisingly, how this widespread pathogen causes illness is not fully understood. Previous work in this laboratory found evidence that the virulence of this pathogen was decreased in three mutants that also displayed a red growth phenotype. In order to better understand the mechanism behind this phenotype the research presented here sought to identify and isolate additional random mutants displaying the red growth phenotype. Random mutants were produced with a signature-tagged mutagenesis system previously developed for C. jejuni. Mutant DNA was produced in vitro and naturally transformed into wild type C. jejuni NCTC11168. This culture was plated to chloramphenicol Mueller Hinton Agar plates allowing growth of only mutant bacteria. All colonies with a red appearance were sub-cultured. Approximately 8500 mutants were screened and 9 isolates showed red growth. Currently 7 have been further tested, all of which have decreased, but not eliminated, motility. The production time of the red phenotype varies amongst the isolates, as does the growth rate. Current work is ongoing to determine the mutation site of all confirmed red isolates by plasmid rescue. These findings should contribute to a better understanding of the genetic basis of the red phenotype, and potentially any involvement in virulence. A greater understanding of virulence mechanisms can lead to development of strategies to help reduce the suffering of those individuals affected by this pathogen.

Row: G Poster Number: 65 Judging Time: 12:30-2

Presenter: Alexis Layman, Christopher Ball Email: afl26@drexel.edu
Major: Environmental Science Academic Field: Environmental Science
Faculty Advisor: Gail W. Hearn Email: afl26@drexel.edu

Amphibian Community Distribution on Bioko Island, Equatorial Guinea

Author(s): Alexis Layman, Christopher Ball, Patrick J. McLaughlin, Gail W. Hearn

Amphibians represent an underutilized opportunity for ecosystem monitoring, specifically in tropical ecosystems. I participated in a study to determine the distribution and abundance of amphibian communities in a tropical montane ecosystem on Bioko Island, Equatorial Guinea (West Africa). With amphibians occurring at such high densities within our study region, we were able to develop a novel approach to quantifying presence and relative density using amphibian census. Data was collected daily via visual detection along trails that served as transects that ranged across three different habitats, spanning an elevation gradient of over 900 meters. Pitfall traps were also used to supplement data on species presence and relative abundance, providing a secondary estimate of relative density and identifying those cryptic species not encountered via census. Our data suggests distinct amphibian community regimes primarily dictated by elevation. Species composition varied greatly between habitat types and within disturbed regions, as was expected. The specific influence of elevation, habitat type, and human disturbance upon amphibian communities remains a target for future research is this system. Secondary benefits of this work include the expansion of the Bioko Island species inventory/range, identification of a new Bioko Island endemic, and development of a novel, comprehensive, non-invasive technique for amphibian surveys. This research establishes the framework for a long-term monitoring program on Bioko Island, which also aims to integrate US and Equatoguinean undergraduate student participation. Annual data from this study, with incorporation of weather data, will provide valuable real-time data on anticipated effects to this ecosystem from global climate change.

Row: G Poster Number: 69 Judging Time: 12:30-2

Presenter: Lori Lester Email: lal56@drexel.edu
Major: Environmental Science, Ecology Academic Field: Environmental Science
Faculty Advisor: Harold W. Avery Email: haltort@aol.com

Diamondback terrapins do not behaviorally respond to boat engine sounds

Author(s): Lori Lester, Andrew S. Harrison, Edward A. Standora, Walter F. Bien, Harold W. Avery

Hearing may be the most important sense of aquatic estuarine animals due to limitations of other senses in turbid water. We determined whether diamondback terrapins (Malaclemys terrapin) behaviorally respond to the underwater sound of approaching boat engines. As part of a population ecology study of diamondback terrapins in Barnegat Bay, New Jersey, we found that 17.4% of terrapins captured (2006-2010, n = 2,221) have been injured and at least 18.9% of those injuries were caused by boat propeller strikes. Previously, we measured Auditory Brainstem Responses (ABRs) and found that terrapins hear a limited range of low frequency tones (100 to 1,000 Hz) including those produced by recreational boat engines. Terrapins were exposed to playback recordings of approaching boats in situ using an underwater speaker. The speeds and waterdepths of swimming terrapins were recorded before, during, and after sound exposure. Changes in roll and pitch were also measured to determine changes in activity level in relation to boat sound. We determined that terrapins did not behaviorally respond to the playback recordings of boats of various sizes and horsepower (mixed-effects model, $p > 0.05$). The failure to behaviorally respond to anthropogenic sounds may be detrimental to terrapin survival in areas with intense boating. Partial or complete closure of some wildlife areas to boating, especially in months of high wildlife activity, may be necessary to protect terrapins and other estuarine species from population declines.

Row: P Poster Number: 131 Judging Time: 12:30-2

Presenter: Runcong Liu Email: rl83@drexel.edu
Major: Physics Academic Field: Physics
Faculty Advisor: Guoliang Yang Email: gy24@drexel.edu

Investigation of the interaction between CTCF and DNA using AFM imaging

Author(s): Runcong Liu

CTCF is a highly conserved protein found in all eukaryotes. It has 11 zinc fingers, which are the typical structure motifs for DNA binding. By applying different combinations of the 11 zinc fingers, CTCF is able to bind to many different binding sites in the genome of an organism.CTCF was studied as a normal regulation protein in the past, it is discovered that CTCF is involved in many transcription regulating process such as activation/repression, insulation, imprinting. Recent studies show that CTCF is able to form unusual DNA structures near binding site, the unusual structure may be a loop, and it is suggested that the forming of such structure may be important for its various functions. With our AFM imaging technology, we are able to capture the conformation of CTCF-DNA complexes after deposit them on a fresh cleaved mica. The AFM images provide a more direct evidence about the DNA unusual structures induced by CTCF, and will serve to study the general principles of CTCF functions in DNA transcription.

Row: G Poster Number: 64 Judging Time: 11-12:30

Presenter: Xiang Liu Email: xl64@drexel.edu
Major: chemistry Academic Field: Chemistry
Faculty Advisor: karl sohlberg Email: kws24@drexel.edu

Using Slater's Rules as a correction to Extend Huckel Theory

Author(s): Xiang Liu

The Extended Huckel Theory (EHT) is one of the simplest semiempirical methods in Quantum Chemistry. It can be successfully applied in calculating the energy levels of cyclic alternating polyenes such as benzene and cyclooctatetraene. But EFT is so unreliable and fails in predicting the molecular structure of cyclooctatetraene that is a stable molecule under EHT but, in fact, will be influenced by Jahn-Teller distortion. Slater's Rules are applied here as a correction to EHT. As found in this work, EHT with the correction of Slater's Rules can successfully predict the molecular structures of benzene and cyclooctatetraene. This new corrected EHT can show that the Jahn-Teller distortion will occur in the planar cyclooctatetraene molecule that is stable in uncorrected EHT. The calculation involved in this new method is still very easy.

Row: P Poster Number: 127 Judging Time: 12:30-2

Presenter: Ernest Mamikonyan Email: enm22@drexel.edu
Major: Physics Academic Field: Physics
Faculty Advisor: Steve McMillan Email: steve@physics.drexel.edu

Modeling Dense Stellar Systems with Atlas

Author(s): Ernest Mamikonyan, Steve McMillan

We present an implementation of a gravitational hydrodynamics code for modeling dense stellar systems. It combines the ability to follow collisional stellar dynamics with a fully conservative formulation of SPH. These capabilities allow us to investigate a wide range of astrophysical problems. Formation of star clusters and the subsequent expulsion of gas, for example, is one problem that we are currently studying.

Row: B Poster Number: 15 Judging Time: 12:30-2

Presenter: Efrat Eichenbaum & Kate McSpadden Email: kemcspadden@gmail.com
Major: Psychology Academic Field: Psychology
Faculty Advisor: Pamela A. Geller Email: pg27@drexel.edu

Coping following pregnancy loss: The relationship between spirituality and women's attributions

Author(s): Kate McSpadden, Efrat Eichenbaum

Women often attribute pregnancy loss to their own behaviors or personal characteristics. Research suggests that internal attributions have different implications for coping and depression than external post-loss attributions (Lasker & Toedter, 2000). James and Kristiansen (1995) found that internal attributions predict more severe grief reactions in women who have lost a pregnancy.
Religious coping is among the more common techniques endorsed by women following pregnancy loss (DeFrain, et al., 1996). However, few studies have addressed the role of spirituality as separate from religiosity or religious coping (George, Larsons, Koeing, & McCullough, 2000).
Participants were women 18 years or older, who have experienced a miscarriage or stillbirth at any point in their lives are eligible for participation. It is projected 30 women will have participated by April, 2011.
Several recruitment methods are used in this study. First, participants are directly recruited at the University of Utah's Hospital in Salt Lake City. Recruitment also takes place through flyers and online. Once eligibility is assessed, participants are provided a packet that includes the Attributional Questionnaire (AQ) and a demographics questionnaire that features a Likert-type scale that assess spirituality.
The AQ and the spirituality question will be used to investigate the relationship between external attributions for loss and spirituality.
Preliminary results revealed that internal attribution for loss and spirituality are significantly related, ($Y = 4.64 + -0.81X$, $SEb = 0.33$, $p < .05$, $R2 = 0.21$). This result may suggest a relationship between women's causal attributions for pregnancy loss and spirituality.

Row: F Poster Number: 58 Judging Time: 11:00-12:30

Presenter: David Melicharek Email: davidmelicharek@gmail.com
Major: Non-Matriculated Academic Field: Biological Sciences
Faculty Advisor: Daniel Marenda Email: dm562@drexel.edu

Kismet/CHD7 regulates cardiac development in a Drosophila model of CHARGE Syndrome

Author(s): David Melicharek, Sukhdeep Singh, Laura Ramirez

Over seventy five percent of patients with CHARGE Syndrome (CS) have a congenital heart defect due to haplo-insufficiency of the gene CHD7. This high prevalence of heart malformations underscores the need for a deeper understanding of cardiac development in CS. Heart tube formation from the lateral mesoderm during embryogenesis is highly conserved between humans and Drosophila melanogaster (fruit fly). In a Drosophila model of CS we decreased Kismet expression, the Drosophila homolog of CHD7, and then characterized any morphological and/or neuroanatomical defects in the heart. By way of Drosophila forward genetics and histological analysis we showed a decrease in heart size, number of cardiac synapses, and aberrant heart morphology. Attributable to the humble fruit fly, the cellular mechanisms and pathogenesis of cardiac defects in CS patients is being illuminated.

Row: AB Poster Number: 1 Judging Time: (technician)

Presenter: Derya Meral Email: deryarr@gmail.com
Major: Physics Academic Field: Physics
Faculty Advisor: Brigita Urbanc Email: bu25@drexel.edu

Early assembly events of N-terminally truncated forms of amyloid β-protein

Author(s): Derya Meral, Brigita Urbanc

Alzheimer's disease (AD) is a leading cause of dementia in elderly. Substantial evidence links the onset of AD pathology to amyloid β-protein (Aβ) association into low molecular weight assemblies, called oligomers. The two predominant alloforms are 40- and 42-residue long Aβ(1-40) and Aβ(1-42), of which the latter aggregates faster and forms more toxic assemblies. Recently, the N-terminally truncated forms of Aβ, which can also be found in the AD brain, were reported to be even more toxic than Aβ(1-42), Here, we use an efficient discrete molecular dynamics approach to study oligomer formation of Aβ(3-40) and Aβ(3-42) 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 Aβ toxicity and are of relevance to development of new therapeutic approaches.

Row: P Poster Number: 130 Judging Time: 11-12:30pm

Presenter: Siddhita Mhatre Email: sdm54@drexel.edu
Major: Biology Academic Field: Biological Sciences
Faculty Advisor: Daniel R. Marenda Email: dm562@drexel.edu

Characterization of a Drosophila Alzheimer's disease Model: Pharmacological Rescue of Cognitive Defects

Author(s): Siddhita Mhatre, Ranjita Chakraborty, Vidya Vepuri, Brie Paddock, Sarah Michelson, Radha Delvadia, Sean Miller, Mariana Vinokur

Alzheimer's disease (AD) is an age related neurodegenerative disease. The neuropathology of AD is characterized by accumulation and deposition of β-amyloid (Aβ) peptide and neuro-fibrillary tangles in the brain. Aβ peptide is generated by sequential endoproteolysis of amyloid precursor protein (APP) by β-site APP cleaving enzyme (BACE) followed by intramembraneous γ-secreatase cleavage. Differential cleavage of APP by γ-secretase produces Aβ40 and Aβ42 peptide, of which Aβ42 is found to be toxic and forms aggregates. Transgenic models of AD have made significant contributions to our understanding of AD pathogenesis, and are useful tools in the development of potential therapeutics. The fruit fly, Drosophila melanogaster is a powerful model for studying complex diseases like AD. Here, we are developing an AD model by over-expressing human APP and BACE genes in Drosophila central nervous system. Biochemical, neuroanatomical and behavioral analyses indicate that these flies exhibit aspects of clinical AD neuropathology and symptoms. These include the generation of Aβ40 and Aβ42 leading to the formation of amyloid aggregates. Treatment with a γ-secretase inhibitor suppresses these phenotypes. The data taken together demonstrate that this transgenic AD model can serve as a powerful tool for the identification of AD therapeutic interventions.

Row: B Poster Number: 19 Judging Time: 12:30-2

Presenter: Crystal Moorman Email: cmm436@dreel.edu
Major: Physics Academic Field: Physics
Faculty Advisor: Michael Vogeley Email: msv23@drexel.edu

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

Author(s): Crystal Moorman

We are interested in how the environment affects star formation and galaxy evolution in the Universe. To do this, we compare galaxies in densely populated regions and voids. Voids are significantly under-dense regions of the universe where little visible matter exists, which are pristine environments for determining the accuracy of galaxy evolution models. We are particularly interested in dwarf galaxies, because they are more sensitive to

the effects of interaction and feedback affecting star formation. In order 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. Using the Sloan Digital Sky Survey (SDSS), we define void regions and determine stellar masses of galaxies. We use the Arecibo Legacy Fast ALFA (ALFALFA) Survey to measure the HI mass in these galaxies. We will also use the HI flux spectrum from ALFALFA to calculate the HI mass function (HIMF). We use this, as well as the gas mass fraction, to compare the star formation and galaxy evolution of void vs. non-void galaxies.

Row: E Poster Number: 45 Judging Time: 12:30-2

Presenter: Katelyn Walsh, James Spotila Email: noga.noga@gmail.com
Major: Biology Academic Field: Biological Sciences, Environmental Science
Faculty Advisor: James Spotila Email: spotiljr@drexel.edu

From Earth to Sky: A year of Learning Experience on Global Climate Change in the Drexel University Community

Author(s): Noga Neeman, Amitabha Basu, PhD, Michael O'Connor, PhD, Harold Avery, PhD, Elizabeth Haslam, PhD, Laurie Cotroneo, PhD, Katelyn Walsh,

In this presentation we celebrate the success of our 'From Earth to Sky: Student Experiential Learning in Global Climate Change' grant funded by a NASA sponsored global climate change education (GCCE) project. In one year, we successfully attracted and engaged students and scientists/experts from disparate backgrounds, including life, environmental and natural sciences, engineering, business, law, art and weathermen in pragmatic but civil dialogue about climate change. Here we present a collage of artifacts and creations that resulted from this engagement in the Drexel University community.

Row: N Poster Number: 106 Judging Time: 11-12:30

Presenter: Michelle S. Livings Email: in35@drexel.edu
Major: Chemistry Academic Field: Chemistry
Faculty Advisor: Elizabeth T. Papish Email: ep322@drexel.edu

Ruthenium catalyzed hydrogenation supported by a novel bipyridyl ligand

Author(s): Ismael Nieto, Michelle S. Livings, Matthias Zeller, Elizabeth T. Papish

We have developed a novel Ruthenium chloride pre-catalyst supported by 6,6'-dihydroxy-2,2'-bipyridyl ligand ([(p-cym)RuCl(dhbp)]Cl). The novel feature of our bipyridyl ligand was the availability of electron donor groups near the metal center; these groups were proposed to improve catalytic activity. This catalyst was shown to be effective in transfer hydrogenation on a series of ketones in both isopropanol and in aqueous/methanol solutions. Results on the hydrogenation of ketones and imines by our pre-catalyst will be discussed. Determination of whether these donor groups within the bipyridyl ligand affect catalytic activity will also be addressed.

Row: O Poster Number: 119 Judging Time: 11:00-12:30

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

Finite-Element Analysis in Quantum Mechanics

Author(s): Allyson O'Brien

The Finite-Element Method (FEM) is a numerical technique for estimating solutions of partial differential equations. FEM is widely used in engineering and applied sciences, but it is not considered a standard tool in quantum mechanics. We investigate the use of FEM to solve quantum problems that are impractically difficult when using other methods. Specifically, we focus on finding eigenstates and energies of the Schrödinger equation in two dimensions. Separable solutions are well-known, but these solutions only apply to problems with symmetries that are easily expressed in common coordinate systems (primarilyrectangular, cylindrical, or spherical). In many applications, these symmetries are absent.
We first compare FEM results to known solutions to verify their accuracy. We then apply FEM to problems with boundary conditions which are asymmetric and/or difficult to describe in conventional coordinates. We find that many such problems can be solved quickly and accurately without need for extraordinary computing time or power.

Row: O Poster Number: 117 Judging Time: 12:30-2

Presenter: Daniel Parry Email: dan.t.parry@gmail.com
Major: Mathematics Academic Field: Mathematics
Faculty Advisor: Robert Boyer Email: boyerrp@drexel.edu

Plane Partition Polynomials and Partition Functions

Author(s): Daniel Parry

Since the time of Boltzmann a particular class of polynomials called Partition Functions have been used to study the behavior of physical systems. An example of such polynomials are the plane partition polynomials which relate an object known as a plane partition to an attribute known as its trace. These polynomials are loosely related to the energy distribution of quantum gases.
We will demonstrate many results about the plane partition polynomials. In particular, we will give the distribution of the zeros of the plane partition polynomials in the complex plane, provide approximations for these polynomials and use those approximations to understand the behavior of a random plane partition's trace.

Row: R Poster Number: 148 Judging Time: 12:30-2

Presenter: Samir Patel Email: shp42@drexel.edu
Major: Environmental Science Academic Field: Environmental Science
Faculty Advisor: James Spotila Email: spotiljr@drexel.edu

Post-Nesting Behavior of Loggerheads from Crete Revealed by Satellite Telemetry

Author(s): Samir Patel

Loggerhead turtles (Caretta caretta) are one of the most generalized species in terms of feeding, foraging and nesting locations. However, even though generalist behavior may contribute to resiliency, this species is endangered, and recent research indicates that a warming climate could dramatically affect them. While populations in the Atlantic and Pacific have a wider range of locations for foraging and nesting, the Mediterranean subpopulation is confined to a very small and relatively homogenous basin. Movement of oceanic species to higher latitudes has occurred as global temperatures increased, but that may not be possible in the Mediterranean. The purpose of this study is to determine what adaptations are occurring or are possible for loggerheads in the Mediterranean Sea. Greece contains the most important nesting beaches in the Mediterranean for loggerheads. Rethymno, Crete contains the third most populated nesting beaches averaging approximately 300 nests per season. In late July, during the 2010 nesting season in Rethymno, we attached satellite transmitters to five female loggerheads immediately after their final nesting event. Four transmitters functioned as expected and sent data for more than 60 days. Three loggerheads traveled to the north coast of Africa eventually settling within the Gulf of Gabes. These turtles travelled approximately 1300km to their foraging site. The fourth remained very close to the nesting beach, travelling approximately 300km to a small island south of Crete called Gavdos. Each turtle has taken resting dives to depths of over 100m and lasting over 90min. While foraging, these turtles have taken as many as 66 dives in 4h. Even with this small sample size, overall behavior has varied. For example, one individual foraged continuously once reaching her foraging site, while others spent

time foraging as well as resting. By consolidating these data, an ecological niche can be determined for the loggerheads of the Mediterranean.

Row: B Poster Number: 13 Judging Time: 11-12:30

Presenter: Steven Pearson Email: shp36@drexel.edu
Major: Environmental ScienceAcademic Field: Biological Sciences, Environmental Science
Faculty Advisor: Harold Avery Email: haltort@aol.com

Competition between Pennsylvania's state-threatened red-bellied turtle (Pseudemys rubriventris) and invasive red-eared slider turtles (Trachemys scripta elegans)

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

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 and spatial resources. In the United States Mid-Atlantic region the red-bellied turtle (Pseudemys rubriventris) is ecologically similar to red-eared slider turtles and has undergone population declines in wetlands where red-eared slider turtles have been introduced. In human impacted wetlands where red-eared slider turtles and red-bellied turtles overlap, the potential for competition exists between these two species due to extensive overlap for dietary and spatial resources. We will complete manipulative experiments with juvenile turtles of both species to determine the underlying mechanisms of how slider turtles may compete with red-bellied turtles for limited resources. Using outdoor tanks, we will house single or mixed species groups at low and high densities to determine how species compete for limited dietary and thermoregulatory resources. We will compare growth rates ingestion rates, and behavioral interactions of turtles housed in single and mixed species groups to determine whether red-eared slider turtles outcompete red-bellied turtles for environmental resources. 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 an ecologically similar native species that is in decline.

Row: F Poster Number: 61 Judging Time: 12:30-2

Presenter: Keerthy Pirooznia Email: keerthycv@gmail.com
Major: Biology Academic Field: Biological Sciences
Faculty Advisor: Felice Elefant Email: fe22@drexel.edu

An epigenetic role for Tip60 in APP mediated axonal outgrowth that controls circadian rhythm

Author(s): Keerthy Pirooznia, Kellie Chiu

Age-related memory deficits are associated with gene misregulation in the aging brain; however the mechanisms underlying the decline of such gene control is currently 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 drive cognitive decline. Intriguingly, sleep dependent mechanisms of neural plasticity have been recently linked to memory formation and thus disruption of these processes may also contributive to cognitive decline. Given the strong link between histone acetylation and cognition, it is essential to study the histone acetyltransferase (HAT) enzymes that create such marks. One promising candidate is Tip60, a HAT implicated in the age-associated neurodegenerative disorder Alzheimer's disease (AD) via its complex formation with the amyloid precursor protein (APP) intracellular domain (AICD) that serves to epigenetically regulate gene expression. To investigate a role for Tip60 in APP mediated neuronal processes, we chose to assess axonal outgrowth of the small ventrolateral neurons (sLNv) in the Drosophila brain as 1) their outgrowth is mediated by APP and 2) they are a well-characterized key subset of clock neurons that regulate sleep control. Here, we show that targeted expression of dominant negative (DN) HAT defective Tip60 in the sLNv results in a significant decrease in axonal outgrowth. Importantly, these flies also exhibit significant negative changes in their sleep pattern consisting of increased daytime sleep and fragmented night time sleep. Co-expression of APP with HAT mutant Tip60 exaggerates the negative effect on the sLNv axonal outgrowth, resulting in significantly shorter axons. In contrast, co-expression of a truncated version of APP lacking the C-terminus (required for interaction with Tip60) with HAT mutant Tip60 partially rescues this axonal growth phenotype. Efforts to identify the putative target genes of the Tip60 slash AICD complex mediating the observed effects and the potential implications of the sleep disturbances for memory formation are currently underway.

Row: L Poster Number: 87 Judging Time: 12:30-2

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

Determining the function of the collagen gene in T. erythraeum

Author(s): Simara Price, Dr. Shivanthi Anandan

The cyanobacterial species Trichodesmium erythraeum plays several key roles in marine ecology and the global climate. Found in oligotrophic tropical and subtropical oceans, these diazotrophs contribute over 50% to the nitrogen content of these environments by nitrogen fixation. They are a filamentous cyanobacterium that aggregates as they form large blooms that are visible from space. Bloom formation creates an anoxic environment as they cover the aquatic surface. The cellular pathways leading to bloom formation remain largely unknown. The T. erythraeum genome contains a long collagen-like gene sequence (Tery_0397) that shares 45% protein identity with vertebrate collagen. Being that collagen is a protein that is involved in the formation of extracellular matrices we hypothesize that this protein contributes to aggregation and eventually to bloom formation. Unfortunately, there is no genetic system developed yet for T. erythraeum. To investigate the function of this gene and determine its role in bloom formation, we will express the gene in a heterologous system; the unicellular cyanobacterium Synechococcus elongatus. S. elongatus is not known to form blooms. This poster will outline the strategy and methodology being utilized to overexpress the collagen in S. elongatus.

Row: L Poster Number: 93 Judging Time: 12:30-2

Presenter: Stephanie Rabin Email: sjr58@drexel.edu
Major: Psychology Academic Field: Psychology
Faculty Advisor: James Herbert Email: james.herbert@drexel.edu

Testing an Alternative Hypothesis for Cognitive Bias Modification for Public Speaking Anxiety

Author(s): Stephanie Rabin, James D. Herbert, Evan M. Forman, Shmuel Lissek, Breann M. Erford, Stephanie P. Goldstein

Anxious and depressed individuals tend to show biases in cognitions and implicit attitudes when presented with affectively-laden stimuli relevant to their specific mood state. Cognitive Bias Modification (CBM) is a new area of research based on the notion that these biases can be changed relatively quickly and easily, resulting in symptom reduction. CBM attempts to modify maladaptive cognitions by training individuals to attend to more desirable stimuli rather than the stimuli that are consistent with the individuals' cognitive biases. In some cases, CBM requires as little as a single computer-based intervention. Several recent studies (e.g., Amir, Beard, Burns, and Bomyea, 2009; Amir, Beard, Taylor, et al., 2009; Amir, Weber, Beard, Bomyea, and Taylor, 2008; Li, Tan, Qian, and Liu, 2008; Schmidt, Richey, Buckner, and Timpano, 2009) have demonstrated that computer-based CBM treatments, compared with control conditions, reduce social anxiety in both clinical and non-clinical samples. However, the design of these studies leaves open the possibility that simple attentional training, rather than bias modification per se, is responsible for the treatment effects. The current study attempts to replicate a one-session CBM study for public speaking (Amir et al., 2008) to verify this phenomenon, as well as to test this

alternative hypothesis by implementing a second control condition that undergoes simple attentional training.

Row: Q Poster Number: 137 Judging Time: 12:30-2:00

Presenter: Thomas Radzio Email: tar55@drexel.edu
Major: Biological Sciences Academic Field: Biological Sciences
Faculty Advisor: Michael P. O'Connor Email: mike.oconnor@drexel.edu

Use of Automated Telemetry to Quantify Ornate Box Turtle Activity and Nesting Patterns

Author(s): Thomas Radzio, Jeramie T. Strickland, Charles Tucker, David K. Delaney

Miniature data loggers and transmitters allow biologists to efficiently study wary or cryptic animals in their natural habitats with minimal disturbance. In spring-summer 2010, we investigated whether automated radio telemetry and the signal change method could be used to quantify the activity and nesting patterns of ornate box turtles (Terrapene ornata) inhabiting a sand prairie in northwestern Illinois. The signal change method relies on the principle that any movement of a radio transmitter (including minor changes in orientation) can strongly affect the intensity of the transmitter's signal at a stationary receiving station. Using video recordings of radio-monitored turtles, we confirmed that this method provides accurate indices of box turtle activity patterns. Notably, between late May and mid-June, most of 19 monitored females exhibited substantial activity on 1 or more nights. Previous reports indicate that ornate box turtles nest at night, but are otherwise inactive after dark. Based upon this information, relatively little indication of night activity by males, and other patterns present within the radio signal recordings, we hypothesized that night activity corresponded to nesting. We visually confirmed nesting in 3 of 4 night-active females, but observations of the fourth female were inconclusive. Although our validation efforts are limited, the night activity recordings and visual observations suggest that females may require multiple nights to successfully nest. In conclusion, we demonstrate that the signal change method can be used to generate accurate indices of box turtle activity and, potentially, nesting patterns.

Row: D Poster Number: 40 Judging Time: 11-12:30

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

The effects of density, fire, and climate change on the plant pollinator community of Gentiana autumnalis

Author(s): Ryan Rebozo

The dynamics of plant-pollinator communities are an important component for understanding whole-ecosystem functions. It will be important to understand what factors lead to changes within these communities. These factors must also be taken into account when establishing management criteria for rare species. This proposed study aims to determine the effects of density, fire and climate change on the pollination community of Gentiana autumnalis. Gentiana autumnalis is a late season flowering plant that is listed as a threatened species by the New Jersey Pinelands Commission. Comparisons of visitation rate and seed set will be made across different densities and patch sizes along with observations of the changes pre and post fire to this specific pollination community. Lastly phenology records will be kept and used to predict structural zeros in the community and to simulate extinctions which will test how resilient this pollination community is to collapse caused by climate change.

Row: C Poster Number: 29 Judging Time: 12:30-2

Presenter: Marisa Roman Email: mbr35@drexel.edu
Major: Physics Academic Field: Physics
Faculty Advisor: Guoliang Yang Email: gyang@physics.drexel.edu

Macromolecular crowding in the mechanical unfolding forces of I-27

Author(s): Marisa Roman

Macromolecules can occupy a large fraction of the volume of the cell and this affects many properties of the proteins inside the cell, such as thermal stability and rates of folding. We present a study comparing the effects of the size of molecular crowders on the unfolding forces of Ig-27. We used an atomic force microscope based single molecule method to measure the effects of the crowding on the mechanical stability of this protein. We used dextran as the crowding agent with three different molecular weights, with concentrations varying from zero to 300 grams per liter in the buffer solution. The results show that the forces that are required to unfold molecules are enhanced when high concentration of dextran molecules is added to the buffer solution and also that there is a maximum force when the crowder size is comparable to the protein.

Row: L Poster Number: 91 Judging Time: 12:30-2

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

Tip60 HAT activity controls synaptic plasticity

Author(s): Jessica Sarthi

Recent studies support an emerging hypothesis that aberrant changes of specific histone acetylation marks in chromatin of the aging brain drives cognitive decline and specifically, memory impairment; however the specific histone acetyltransferases (HATs) involved in this process remain to be identified. As synaptic function is central for learning and memory, we use the Drosophila neuromuscular junction (NMJ) as a well characterized synapse model to identify HATs that control synaptic plasticity and structure. Here, we show that the HAT Tip60 is localized in the brain and central nervous system of the developing fly, and is specifically concentrated both pre and post-synaptically within the NMJ. Targeted reduction of Tip60 HAT activity specifically within the synapses of the NMJ causes a dramatic increase in synapse structure and bouton number, with the excess boutons being smaller in size and irregularly shaped. Although the excess boutons contain the active zones indicative of synapse function, they are not portioned proportionately to compensate for the increase in bouton number, suggesting that these excess boutons have decreased functionality. Further analysis of microtubule organization within these excess boutons using immunohistochemical staining to the microtubule organizing protein futsch, reveals a significant increase in the rearrangement of microtubule loop architecture that is required for bouton division, suggesting that the increased numbers of boutons may be partly due to Tip60 induced futsch misregulation. Taken together, our results support a role for Tip60 HAT activity in synaptic plasticity that may be linked to learning and memory. Future investigation into the molecular mechanisms underlying Tip60 HAT function in specific neuronal processes in the fly, particularly those associated with learning and memory, should enhance our understanding into the link between acetylation, cognitive aging and age-related neurodegenerative disorders.

Row: A Poster Number: 6 Judging Time: 11-12:30

Presenter: Jason Schein Email: scheijp@gmail.com
Major: Biology Academic Field: Biological Sciences
Faculty Advisor: Kenneth J. Lacovara Email: kjl24@drexel.edu

Paralbula in North America: Revisiting an Enigmatic Campanian-Late Paleocene Teleost with Hope for New Insights

Author(s): Jason Schein, Barbara S. Grandstaff, William B. Gallagher, Jason C. Poole, Kenneth J. Lacovara

Paralbula is a common genus of teleost fish in Campanian to Thanetian units nearly throughout North America, though it is also found in Europe and Africa where it survived into the Eocene. The genus, and the entire family Phyllodontidae, is known almost solely from uncommon basibranchial and parasphenoid tooth plates and common, isolated teeth. As a result, important paleoecological interpretations and phylogentic relationships are

inferred entirely from tooth characteristics, tooth plate form, and stratigraphic distribution. Most gross generic anatomical characteristics are completely unknown.
Paralbula is most common in North America, where its isolated teeth are often very abundant within marine vertebrate fossil assemblages. The genus is found almost exclusively in deposits representing near-shore and/or marginal marine environments, where the rounded, phyllodont dentition characteristic of the family is thought to represent an adaptation for crushing invertebrate shells or exoskeletons. Paralbula appears to occur rarely in fluvial sediments, suggesting either that these fish were diadromous, or that those remains are allochthonous.
Within North America, only two species of Paralbula are recognized. P. casei is far more common, with remains collected from middle Campanian through Paleocene (Thanetian) sediments across the continent. Until recently, P. marylandica was known only from two basibranchial tooth plates from the Thanetian Aquia Formation of Maryland. However, a recent discovery of autochthonous P. marylandica remains from the Maastrichtian – Danian basal Hornerstown Formation in New Jersey (NJSM GP21877) requires a revision of this species' geographic and stratigraphic range. More importantly, these remains consist of multiple skull elements, including several toothed elements, and scales; thus constituting by far the most complete set of remains known from any specimen within the genus, and highly unusual for the Phyllodontidae as a whole.

Row: E Poster Number: 51 Judging Time: 12:30-2

Presenter: John Schreck Email: jsschreck@gmail.com
Major: Physics Academic Field: Physics
Faculty Advisor: Jian-Min Yuan Email: jsschreck@gmail.com

Potts Models for Protein Aggregation and Folding

Author(s): John Schreck

We use Potts models to study protein folding, and aggregation of pep- tides, such as α-synuclein and Aβ(1-40). Our statistical mechanical model yields an exact expression for the average properties of a sys- tem of assembled peptides, including the critical fibril concentration. We fit our models to CD and AFM data and discuss model predictions.

Row: L Poster Number: 88 Judging Time: 11-12:30

Presenter: Jennifer Serico Email: jms339@drexel.edu
Major: Clinical Psychology Academic Field: Psychology
Faculty Advisor: Naomi Goldstein Email: neg23@drexel.edu

Biases in Reporting Relational Aggression: Implications for the Juvenile Justice System

Author(s): Jennifer Serico, Amy Brammel, Shelby Arnold, Melinda Wolbransky, Naomi Goldstein

Aggression research has recently begun to distinguish between physical and relational aggression (i.e., the damage or threat of damage to relationships). Little research exists on the methodology of reporting relational aggression experiences. A study of 179 participants examined the methodological biases in the reporting of relational aggression, specifically role (i.e., victim or perpetrator) and presentation order of role in reported frequency. Findings indicate that, unlike physical aggression, individuals are more likely to report perpetration than victimization of relational aggression. Implications for the assessment of relational aggression, particularly in the context of the justice system, will be discussed.

Row: C Poster Number: 30 Judging Time: 11-12:30

Presenter: Micholas Smith Email: mds322@drexel.edu
Major: Physics, PhD Program Academic Field: Physics
Faculty Advisor: Luis Cruz Cruz Email: lrc42@drexel.edu

Effect of Ionic Salt Solution on Folding Dynamics of ABeta(21-30)

Author(s): Micholas Smith

The amyloid β-protein (Aβ) has been implicated in the pathogenesis of Alzheimer's disease. Although little is known about the initial deleterious misfolding of the full-length Aβ, in vitro experiments have shown that a 21 through 30 fragment of Aβ, the Aβ(21-30), may be the folding nucleus of the full-length protein. Our previous all-atom molecular dynamics work shed light on the behavior of the Aβ(21-30) in bulk water. Here, we explore the effects on the folding dynamics of the Aβ(21-30) of dissolved ionic salts (NaCl, CaCl2, KC1, and MgC12) that are common to the cellular environment. Using two microsecond-long all-atom molecular dynamics simulations; we find that extended beta secondary structures are suppressed by the addition of any ionic salt. Our results suggest that electrostatic interactions between the ions and residues play a significant role in the folding path of the fragment.

Row: A Poster Number: 3 Judging Time: 11-12:30

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

Seasonal Variation of Defensive Symbionts in Pea Aphids from Southeastern PA

Author(s): Andrew Smith, Matthew Novin, Jacob Russell

Insects have developed many strategies to defend against attack by parasitoids, which can vary between species and even within and across populations over space and time. The pea aphid, Acyrthrosiphon pisum, has been shown to have varying levels of resistance against the endoparasitoid wasp Aphidius ervi with the rate of successful parasitism varying seasonally and between host plants. The facultative bacterial symbiont, Hamiltonella defensa, is found at intermediate levels within many pea aphid populations and has been shown to defend the aphid against A. ervi when in association with bacteriophage(APSE 2 and 3). Under controlled conditions, the level of protection conferred by this symbiont has been shown to decline at high temperatures, a phenomenon that could contribute to the observed seasonal changes in resistance. The objective of this study was to determine the level of seasonal variation in the prevalence of the defensive symbiont, H. defensa, and the associated bacteriaphage, APSE, in field collected pea aphids from alfalfa and clover, testing the prediction that these symbionts should decline during hotter periods due to likely reductions in the conferred degree of defensive benefits at these same times. Alfalfa and clover fields were sampled periodically from late April to early September. We found variation in the proportion of aphids infected with H. defensa and APSE between dates and fields in alfalfa, while no aphids collected from clover had either of these microbes. Multiple facultative endosymbionts have been discovered in the pea aphid whose roles are not all well understood. Future research directions aim to determine the impact that biotic and abiotic factors have in shaping symbiont prevalence and how these symbionts affect their aphid hosts under natural field conditions.

Row: B Poster Number: 14 Judging Time: 11-12:30

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

Nesting Ecology and Dispersal Patterns of Emerging Northern Pine Snake Neonates

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. This fossorial snake excavates its winter hibernaculum and

underground nest. The range of abiotic factors associated with pine snake nesting ecology is poorly understood. We plan to characterize pine snake nest structure, analyze nest substrate texture (particle size), and measure substrate shear strength. Abiotic variables (temperature, soil water content, and CO2) thought to facilitate hatching and cue neonate nest egress will be measured throughout the incubation period. After emergence, neonate movement patterns will be recorded using a camera monitoring system to elucidate whether neonates disperse in a uniform, clumped, or random distribution. We plan to develop a photographic recognition system for identifying individual neonates. Unique pigmentation patterns (head and body markings) of each neonate will be photographed, analyzed using digital pattern recognition software, and cataloged into a digital library. This non-invasive method will negate the need for using invasive identification methods such as insertion of pit-tags, branding, or scale clipping. An understanding of nest structure, nest biophysical ecology, and neonate dispersal behavior will have important conservation and mitigation value when constructing artificial nests that simulate natural nest conditions.

Row: D Poster Number: 41 Judging Time: 11-12:30

Presenter: 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.

Row: O Poster Number: 114 Judging Time: 12:30-2pm

Presenter: Ronald M. Smith Email: smithro@mccc.edu
Major: Environmental Science Academic Field: Environmental Science
Faculty Advisor: Walter F. Bien Email: wbien205@comcast.net

The Spatial Ecology of the Northern Pine Snake in Relation to Military Activities in the New Jersey Pinelands

Author(s): Ronald Smith, Harold W. Avery, James R. Spotila, Walter F. Bien

The northern pine snake (Pituophis melanoleucus) is a state-threatened species and occurs as a disjunct population in the Pinelands of southern New Jersey. The Warren Grove Gunnery Range (WGR), occupies 3,810 ha of upland pine-oak forests, wetlands, and disturbed sites created by military operations. We used radio telemetry to monitor the home range and movements of 14 male and 9 female pine snakes between fall 2002 and spring 2007. Pine snakes exhibited diurnal behavior, with highest activity in the morning hours, peaking at 0900 hours. Monthly activity peaked during July and highest levels of activity were observed within a temperature range of 25.1 - 30.0 oC. There were no significant differences in home range size, core activity areas, range length, distance traveled per day, or seasonal differences in activity between male, non-gravid female, and gravid female snakes or between snakes within the target zone and outside the target zone. There was a significant difference during the 2005 and 2006 active seasons in total distance traveled with snakes in the target zone traveling a greater distance than snakes outside the target zone. We identified nesting sites and winter hibernacula, documented instances of foraging, feeding, and reproduction within the target zone. Home ranges for our study were similar to those reported in populations of pine snakes outside of New Jersey. Our data suggest that military operations did not significantly impact this snake population. These data support the conclusion that WGR was an important refuge for pine snakes in the Pinelands.

Row: Q Poster Number: 145 Judging Time: 12:30-2

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

Disturbance, Fire Effects, and Seed Banking in a Federally-Threatened Sedge

Author(s): Marilyn Sobel, Walter F. Bien

Anthropogenic disturbance can have negative effects on common and rare plant taxa. However, disturbance that maintains early-successional conditions can be positive for Rhynchospora knieskernii, a disturbance-dependent species. We monitored a population

of R. knieskernii at the Warren Grove Gunnery Range where disturbance from fire (wildfire and prescribed burns) and military operations (mowing, road maintenance, ordnance delivery) provided an ideal disturbance regime to examine the effect of disturbance on this Federally-threatened sedge. A year after a prescribed burn, the population was estimated at 11,847 plants in 2005. Over six years the population has had a steady annual decline; the population was estimated at 809 plants in 2011. This population decrease is thought to be related to light loss as a result of increased tree canopy-closure and/or a decrease in soil-water availability. We plan to examine the effect of different edaphic factors (including fire effects), water availability, and canopy cover on R. knieskernii life history stages (germination, growth, flowering, and seed production). Data that elucidate seed bank dynamics, dispersal mechanisms, fitness requirements, and ecological relationships will be important for the conservation of this rare species.

Row: C Poster Number: 27 Judging Time: 12:30-2

Presenter: Kelly Somers Email: ks847@drexel.edu
Major: MS Environmental Science Academic Field: Environmental Science
Faculty Advisor: Danielle Kreeger Email: dkreeger@delawareestuary.org

The contribution of land use practices to tidal wetland health in representative Delaware Estuary marshes

Author(s): Kelly Somers, Dr. Danielle Kreeger

Coastal wetlands are a hallmark feature of the Delaware Estuary where they furnish a variety of important ecosystem and human services. They can be more productive than tropical rainforests, provide rare and abundant animals with breeding and nesting grounds, enhance water quality, and protect our coasts from flooding. These coastal wetlands have long been maligned in the Delaware Estuary where nearly half have been lost, degraded or otherwise altered. According to the USFWS and NOAA, the loss of these important habitats continues despite increased attention. The Delaware Estuary lost more than 3,000 hectares of coastal wetlands between 1996 and 2006. Remote sensing data suggests the majority of our remaining 150,000 hectares of tidal wetlands are degraded in condition.

Various past and present stressors appear to be contributing to the decline of coastal wetlands in the Delaware Estuary. A new study is underway to attempt to discern the most important causes of degraded salt marsh conditions in three representative watersheds of the Delaware Estuary: the St. Jones, the Broadkill and the Maurice River Watersheds. Each has diverse histories of marsh management. These practices will be contrasted with known stressors in the watersheds as well as current wetland configuration and condition, which are being assessed by the Partnership for the Delaware Estuary and collaborators using rapid methods. Aerial photographs will be examined to determine the extent of

human alteration of the studies salt marshes. Taken together, findings from these comparative analyses should help guide future best management of our remaining coastal wetlands.

Row: N Poster Number: 112 Judging Time: 11-12:30

Presenter: Heidi Strohmaier Email: Heidi.strohmaier@gmail.com
Major: Psychology Academic Field: Psychology
Faculty Advisor: David DeMatteo Email: dsd25@drexel.edu

Incorporation of Psychopathy into the DSM-V

Author(s): Heidi Strohmaier

Experts in the field of forensic psychology have worked hard to understand and explain Psychopathy. Substantial efforts have been made to distinguish this construct from the more common Antisocial Personality Disorder. Despite their similarities, the two disorders differ in several ways including prevalence, severity, etiology, and treatment needs. The current version of the Diagnostic and Statistic Manual of Mental Disorders (DSM-IV-TR) includes diagnostic criteria for Antisocial Personality Disorder, but not for Psychopathy. The DSM-V work group proposes extensive changes to the Personality Disorder section of the manual. One modification includes the incorporation of Psychopathy into the DSM-V in a combined category with Antisocial Personality Disorder. Potential implications of the merging of these two disorders on sentencing, risk assessment, and treatment are discussed.

Row: M Poster Number: 96 Judging Time: 11:00-12:30

Presenter: Chengjun Sun Email: cs688@drexel.edu
Major: Chemistry Academic Field: Chemistry
Faculty Advisor: Lynn Penn Email: lynn.s.penn@drexel.edu

Toward Covalent Attachment of Proteins to Solid Surfaces

Author(s): Chengjun Sun, Carol Sha, Lynn Penn

Our ongoing research involves the covalent attachment of selected proteins to solid surfaces. Since the attachment will be done by native chemical ligation, involving the reaction between a thioester (on the protein) and a cysteine residue, we must derivatize our solid surfaces with the cysteine residue, either directly or by means of a polyethylene

oxide linker of the desired length. Reaction schemes for introducing cysteines to surfaces first were developed on model compounds in solution and then were conducted on the solid surface. The quartz crystal microbalance (QCM) and the Sauerbrey equation were used to determine the number of cysteine residues attached per unit surface area. Observed frequency change of the QCM results indicated 4-6 protected cysteine residues per square nanometer of surface, in good agreement with a monolayer.

Row: J Poster Number: 80 Judging Time: 11-12:30

Presenter: Jack Suss Email: jss27@drexel.edu
Major: Biology / Environmental Science Academic Field: Environmental Science
Faculty Advisor: James Spotila Email: spotiljr@drexel.edu

Loggerhead turtle nest metabolism and gas exchange in Greece

Author(s): Jack Suss, Samir Patel, Noga Neeman, Aliki Panagopoulou, Thomas Riggall, Dimitris Margaritoulis, Michael P. O'Connor, James R. Spotila

Metabolism is important to embryonic development in oviparous reptiles and is influenced by gas exchange, hydric and thermal conditions, and nest density. Many reptiles deposit their eggs underground where gas exchange is limited by the diffusive properties of the substrate. The clutch of eggs acts as an oxygen sink and a carbon dioxide source. Since these clutches cannot move, the air and water in the sand immediately surrounding the nest influences metabolism. Loggerhead turtles bury their clutches 40 cm deep in the beaches along Laganas Bay, Zakynthos and southern Kyparissia Bay, Western Peleponnese, Greece. These beaches differ in particle size and nest density, which influence gas concentrations. During the summers of 2009 and 2010, our measurements of the physical characteristics of the sand on these beaches and the temperature, oxygen, and carbon dioxide levels in nests allowed us to understand gas exchange in sea turtle nests. Nest temperatures differed among the beaches, influencing sex ratios and incubation duration. The summers had very little rain, and the dry sand reached a depth of 25 cm, which affects the nest hydration. During incubation, oxygen decreased down to 16% and carbon dioxide increased up to 5% in the nests before hatch. Hatching success was lower at Kyparissia A than other beaches due to a higher rate of death at a late developmental stage. That the eggs in loggerhead nests are able to develop under a wide range of environments speaks to the importance of adaptive plasticity during activity-limited life stages.

Row: D Poster Number: 42 Judging Time: 11-12:30

Presenter: Anootnara Talkul Email: anootnara@gmail.com
Major: Biomedical Sciences Academic Field: Psychology
Faculty Advisor: James Herbert Email: jh49@drexel.edu

Functional Near Infrared Spectroscopy (fNIRS): An Emerging Neuroimaging Technology with Important Applications for the Study of Social Anxiety Disorder

Author(s): Anootnara Talkul, Lisa Glassman, James Herbert, Meltem Izzetoglu

Social anxiety disorder (SAD) is one of the most commonly diagnosed psychiatric disorders in the United States. The generalized subtype of SAD typically decreases quality of life and impairs social functioning. There has been an increase in attention to SAD over the past three decades among both researchers and clinicians. Most existing treatments for social anxiety (both pharmacologic and psychotherapeutic) emphasize a reduction of anxiety and avoidance, but neglect to focus as much on improving long-term social performance and relapse prevention. Moreover, underlying treatment mechanisms are poorly understood, and few data exist to support optimal matching of treatments to patient characteristics.

Functional near-infrared spectroscopy (fNIRS) is a promising new technology that has already demonstrated utility in the study of normal human cognition. fNIRS can measure hemodynamic changes in the brain corresponding to cognitive activity under both laboratory and field conditions, because it is portable and less susceptible to movement artifacts when compared to established neuroimaging technologies. fNIRS is less time-consuming to set up and less invasive in administration compared with other neuroimaging techniques, such as EEG, PET, or fMRI. fNIRS is also much less expensive, with near zero run time cost, and hence is more suitable for repeated studies.
This study aims to: 1) investigate frontal hemispheric activity during baseline and active anxiety states in generalized social anxiety using fNIRS technology; 2) determine if baseline fNIRS readings can predict response to two different cognitive behavioral treatments; and 3) explore the reliability and accuracy of frontal lobe fNIRS data during anxiety states in social anxiety by comparing outputs to subjective reports of anxiety. Plans for the study are currently nearing completion, and data collection will begin soon.

Row: N Poster Number: 104 Judging Time: 11-12:30

Presenter: Baochan Tran Email: blt34@drexel.edu
Major: Psychology Academic Field: Psychology
Faculty Advisor: Mike Williams Email: jw37@drexel.edu

Response Style and Intelligence

Author(s): Baochan Tran, Mike Williams, PhD

The WAIS-IV is one of the most widely used measures to assess intelligence in adults. It is comprised of twelve subtests which measure verbal comprehension, working memory, perceptual organization and processing speed. Although the WAIS-IV takes into account various aspects of measuring intelligence, it does not take into account individuals' response styles of impulsivity and reflectivity. Impulsive individuals respond quickly and are prone to commit errors whereas reflective individuals are slower to respond and commit fewer errors. To identify impulsive and reflective individuals, all participants will complete the Matching Familiar Figures Test (MFFT); the 30 individuals who have the fastest response times and commit many errors are identified as impulsive and the 30 individuals who have the slowest response times and commit few errors are identified as reflective. Additionally, each group will be split into two conditions: standard instructions (N=15) in which individuals will receive the instructions for the subtests as written in the WAIS-IV manual and revised instructions in which individuals (N=15) will receive specific instructions on the timed subtests which emphasize the relationship between time and score. Our hypotheses are the following: individuals with reflective test-taking styles in the revised timing instructions will perform the best out of all four conditions, followed by similar performances between impulsive individuals given standard instructions and impulsive individuals given revised instructions; individuals with reflective test-taking styles in the standard timing instructions group will perform the worst out of all four conditions.

Row: F Poster Number: 62 Judging Time: 11-12:30

Presenter: Paul Ullmann Email: pvu23@drexel.edu
Major: Paleontology Academic Field: Environmental Science
Faculty Advisor: Kenneth Lacovara Email: kjl24@drexel.edu

New Turtle Fossils from New Jersey Include Bothremys and the Largest Known Specimen and First Lower Jaw for Taphrosphys sulcatus

Author(s): Paul Ullmann, Kenneth J. Lacovara

New Cretaceous turtle remains from the Inversand Company glauconite pit in Sewell, NJ, include taxonomically informative partial skeletons of the pleurodires Bothremys sp. and Taphrosphys sulcatus. The specimen of Taphrosphys represents by far the largest specimen yet discovered of the taxon and includes a nearly complete skull roof, braincase, plastron, cervical centrum, humerus, metacarpal or metatarsal, pygal, left costal 3, right costal 4, left peripherals 5 through 7, right peripherals 7 and 8, indeterminate carapace fragments, and the first lower jaw for this rare species. Remains of Bothremys include the fused dentaries, nuchal scute, left peripheral one, and indeterminate carapace fragments. These fossils were discovered during Drexel's Spring 2010 Paleoecology field class in the basal Cretaceous-age Main Fossiliferous Layer (MFL) of the Hornerstown Formation.

Unambiguous characters supporting identification of the large turtle as Taphrosphys sulcatus include the unique xiphiplastral notch, box-shaped anterior lobe of the plastron, strap-like rib capitula located very close to the midline, and distinctly pebbled shell surface texture. Additional smaller turtle remains can be unambiguously attributed to Bothremys as they exhibit the following unique characters: deep anterior pits in the mandible triturating surface separated by a high, posterodorsally projecting tomial ridge; ovoid and highly raised capitula separated by a gap from the medial edge of costal plates; nuchal longer than wide; smooth shell surface texture. These side-necked sea turtles lived in a low energy shallow marine setting characterized by the Cretaceous through Paleogene Navesink and Hornerstown glauconitic greensands.

Row: CD Poster Number: 44 Judging Time: 11-12:30

Presenter: Dane Ward Email: dcw33@drexel.edu
Major: Environmental Science Academic Field: Environmental Science
Faculty Advisor: Walter F. Bien Email: wbien205@comcast.net

Population Estimate of the Northern Pine Snake in New Jersey

Author(s): Dane Ward, Harold W. Avery, James R. Spotila, Walter F. Bien

Understanding population dynamics is paramount for successful management and long-term conservation of a 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 status 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). We estimated that an average of 229 adult snakes occurred in the local population on WGR. These data were extrapolated to estimate the current, historical, and rate of decline of the northern pine snake population in New Jersey. We estimated that the northern pine snake has declined from an average of 16,476 snakes in 1986 to 15,188 snakes in 2007, a decline of 61 adult northern pine snakes per year. We plan to test the density model at both the local (WGR) and landscape (Pinelands) scale for better resolution and precision of population estimates. Understanding population size and trends is imperative for improved conservation management of this threatened species.

Row: E Poster Number: 46 Judging Time: 11-12:30

Presenter: Julianne Winters Email: jmw337@drexel.edu
Major: Environmental Science Academic Field: Environmental Science
Faculty Advisor: Harold Avery Email: haltort@aol.com

The Effect of Bulkheading on Diamondback Terrapins in Barnegat Bay, New Jersey

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

Over the past thirty years, Barnegat Bay, NJ has lost a greater percentage of natural shoreline habitat to coastal development and subsequent bulkheading than any other Mid-Atlantic estuary. Among the diverse fauna inhabiting this prolific ecosystem is the diamondback terrapin (Malaclemys terrapin), a keystone species impacted by bulkheading that obstructs their nesting beaches. Female terrapins often nest on the same beach where they hatched, but it is unknown where they will nest when bulkheading obstructs this natal beach. We used radio and sonic telemetry to monitor the terrestrial and aquatic movements of 12 gravid (i.e., egg-bearing) terrapins between experimentally bulkheaded and adjacent reference beaches at two major terrapin nesting sites during the summer of 2010. We documented nesting females utilizing fidelic beaches despite bulkheading. Terrapins traveled six times the distance to nest on a bulkheaded beach compared to those nesting at the reference site, suggesting increased time, energetic costs and survival risks associated with reproduction. While terrestrial displacement was shown to increase, logging sonic receivers documented no significant difference in time spent between aquatic areas adjacent to bulkheaded and reference beaches. In addition, females remained near the nesting beaches after nesting season – a novel finding in terrapin research. Further nesting behavior data will be collected in 2011, in addition to documentation of nest mortality in relation to bulkheading. This research is vital to determining the impacts of human land use on wildlife within the Barnegat Bay ecosystem.

Row: L Poster Number: 94 Judging Time: 11-12:30

Presenter: Ashley Zervos Email: aaz32@drexel.edu
Major: Biology Academic Field: Biological Sciences
Faculty Advisor: Felice Elefant Email: fe22@drexel.edu

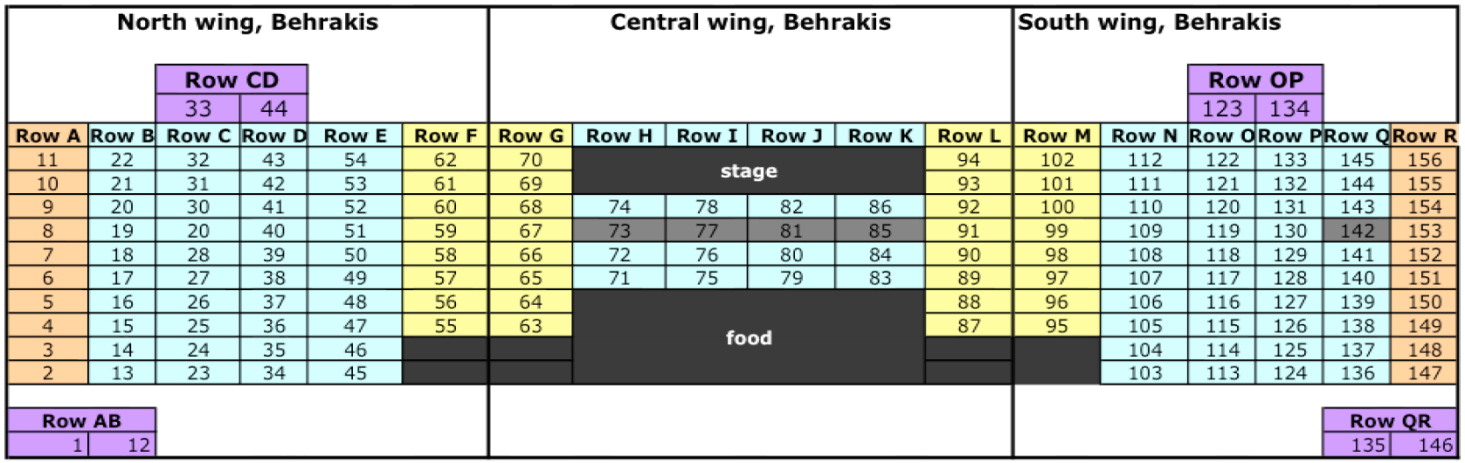
Disruption of axonal transport by the histone acetyltransferase dTip60 in Drosphila

Author(s): Ashley Zervos, William Reube, Felice Elefant

Histone acetyltransferases (HATs) are a key class of enzymes that function to regulate chromatin accessibility to the nuclear machinery that drive appropriate gene expression profiles critical for a variety of cellular processes. The HAT Tip60 is a multifunctional

enzyme involved in transcriptional regulation, cell differentiation, DNA damage repair, and apoptosis, with additional emerging roles in neurodevelopment. For example, Tip60 associates with the Alzheimer's disease (AD) associated amyloid precursor protein intracellular domain (APP-AICD), and this complex is essential for regulating target genes thought to be critical for neuronal processes. Inappropriate complex formation may be involved in contributing to pre-clinical AD-related pathology by misregulation of target genes involved in neurogenesis; however a direct epigenetic based role of Tip60 in this process remains unclear. Here, we used a GAL4-targeted system to modulate dTip60 HAT activity levels in the nervous system of Drosophila melanogaster to investigate the role of dTip60 in axonal vesicle transport, a process typically affected in the pre-clinical stages of AD. Defects in axonal transport are commonly observed early in AD models as swellings or spheroids in the axons consisting of abnormally accumulated vesicles. We show that reduction of Tip60 HAT activity specifically in the nervous system of Drosophila melanogaster using the elav -GAL4 driver led to defects in locomotor function as well as a distinctive tail flipping phenotype reminiscent of nervous system defects and commonly observed in flies carrying mutations in genes required for axonal transport machinery. Importantly, confocal imaging of third-instar larval axons revealed abnormal aggregations of vesicles in response to Tip60 HAT reduction. This study provides insight into a potential epigenetic-based role for Tip60 in axonal transport and early pathophysiological defects associated with AD.

Row: G Poster Number: 68 Judging Time: 11-12:30



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