

P-1 Aerospace sciences.

**Satellite Operations with Solar Anomalous and Magnetospheric Particle Explorer (SAMPEX) at BSOCC Deirdre Beasley Command Controller Traniee Bowie State University's NASA Satellite Control Center** Mentor: Todd Watson.

The Bowie State Operations and Control Center (BSOCC) is a student and facility driven satellite flight operation center that utilizes satellites in tracking astronomical activities. There are two satellites currently controlled at BSOCC, the Solar Anomalous and Magnetospheric Particle Explorer (SAMPEX) and the Wide-field Infrared Explorer (WIRE). BSOCC received flight control permission for SAMPEX in October, 1997 and WIRE on January 25, 2004. Data retrieved by the SAMPEX and WIRE satellite tracking include information in the fields of plasma physics, solar physics, atmospheric physics and asteroseismology. Tasks executed by space flight team members include: building command loads to the satellite during real-time contacts, managing the onboard data recorder, overseeing schedules of ground contacts with the spacecraft, configuring the BSOCC ground system and initiating the set-up of the NASA ground network. In addition the flight operations team perform pre- contact briefings with

P-2 Environmental biology.

**Toxicological Effects of Antimony Sb<sup>3+</sup> on Bean (*Vicia faba*) and Tomato Plant (*Lycopersicon esculentum*)** Amanda Rollizo and Ada Fox, Zofia Gagnon, Marist College School of Science.

Recent studies show that heavy metals have a significant toxicological impact on the environment and living organisms. Antimony is not a naturally abundant element; however, it is used in a wide variety of alloys, especially with lead in battery plates, and in the manufacture of flame-proofing compounds and products. Not much is known of the toxicological effects of antimony which raises significant health concerns due to the multiple applications of the metal. Our experiment is part of a long term toxicological study focusing on the effects of antimony compounds on the growth and development of plant and animal models. A crude toxicological study was performed on two common plant species: *Vicia faba* (bean) and *Lycopersicon esculentum* (tomato), to determine the threshold toxicity level of Sb<sup>3+</sup>. Both species were grown hydroponically with addition of varying concentrations of Sb<sup>3+</sup> (0.0 ppm, 1.0 ppm, 10.0 ppm, 100.0 ppm, 1000.0 ppm) in the form of SbCl<sub>3</sub>. Toxicity was determined by assessment of plant survival and growth (quantified in biomass). Accumulation of metal content was analyzed using a graphite furnace atomic absorption spectrophotometer (GFAAS). Results showed that at 100 ppm Sb<sup>3+</sup> and 1000 ppm Sb<sup>3+</sup> plants did not survive (hours after experiment set up plants wilted). At 1 ppm Sb<sup>3+</sup> slight stimulation of growth was observed. At concentration 10 ppm Sb<sup>3+</sup> a decrease of growth and biomass was recorded. In addition visible necrotic spots on the foliage were present at 10 ppm Sb<sup>3+</sup>. There was also significant accumulation of antimony in plant tissue (proportional to concentration of Sb<sup>3+</sup> in the culture media). The tendency to accumulate high levels of the metal in the tissue raises concern that antimony potentially can be introduced to the food chain at levels toxic to humans and other organisms.

P-3 Ecology.

**Significance of Fragment Weight in *Atta Columbica* Harvesting Behavior.** Isla Colon Panama. Robert Clark, - Central Connecticut State University Dr. Jack Tessier - Central Connecticut State University.

Leaf-cutting, fungus-growing ants are a huge sink for primary productivity in South American and Latin American tropical rainforests. These organisms harvest a significant portion of the plant biomass in forested habitats. Members of the *Atta* genus are highly polymorphic, and have colonies with millions of individual members. Each worker is a genetic sister; however the harvesting behavior is highly complex. This study examines the cutting action of *Atta Columbica*, and their leaf fragment selection in relation to weight, shape and surface area.

Leaf fragments in small versus large fragments and regular versus irregular shapes resulted in no significant variance when weighed in sets of 50 to 100 and analyzed with a Wilcoxin t-test. This supports the hypothesis that weight is the basis for fragment criteria during cutting. This behavior would be energetically efficient in comparison to other cutting criteria like size and shape. Further studies should look into how the *Atta* keep the weight of cuts similar, and if this process is trial and error or based on calculations by individuals.

P-4 Genetics.

**Characterization of the Role of DNA Mismatch Repair in Nitrous Acid Mutagenesis.**

Amy M. Wolcott and Suzanne M. DeschÃnes, Sacred Heart University. Spontaneous mutations occur in nature at low frequencies and are usually corrected by DNA repair pathways to avoid mutations. Nitrous acid (NA) is known to be harmful to organisms because it causes mutations. NA is thought to cause base substitutions by deaminating adenine to form hypoxanthine, guanine to form xanthine, and cytosine to form uracil. All of the deaminations caused by NA do not allow the bases to pair properly with their complementary bases. In *E. coli* two repair mechanisms that are thought to correct DNA damage caused by NA are base excision repair and endonuclease V (EndoV). However, DNA mismatch repair (MMR) may be another DNA repair mechanism that prevents NA mutagenesis. When EndoV is present, we hypothesize that MMR will play a minor role in correcting NA-induced mismatches. When EndoV is absent, MMR may play a bigger role in correcting these mismatches. To detect mutations induced by NA, the *lacZ* reversion assay was used. These experiments were performed under anaerobic conditions to maintain a natural growth environment, whereas other experiments were performed under acidic, aerobic conditions which could be harmful to the bacteria. The cultures are grown with nitrous acid for 16 hours, then washed and plated on minimal glucose and lactose plates, and then left to grow for 48 hours. So far, the results indicate that MMR does not play a significant role in correcting NA-induced mutations, in support of our hypothesis. EndoV is still in these strains and therefore could be playing a bigger role in preventing NA-induced mutations. In future work, we will inactivate EndoV and MMR in these strains to determine if MMR plays any role in preventing NA mutagenesis.

P-5 Vertebrate zoology.

**Detection of the pathogen *Batrachochytrium dendrobatidis* in the critically endangered amphibian *Atelopus varius***

Atel Danielle Scarmoza, Sacred Heart University. Detection of the pathogen *Batrachochytrium dendrobatidis* in the critically endangered amphibian *Atelopus varius* using histological and molecular techniques. Angela Luberto, Michael O Loughlin, Danielle Scarmoza & Twan Leenders Sacred Heart University *Atelopus varius* is a critically endangered species of toad, surviving in a single population on the Pacific side of Costa Rica. Previously abundant, this particular species was considered extinct for 13 years until discovery of few individuals in 2003. The cause for the decline of this species elsewhere remains unknown, but one proposed explanation centers around the fungus *Batrachochytrium dendrobatidis*, which causes the disease chytridiomycosis. *B. dendrobatidis* is an aquatic chytridiomycote that specifically affects amphibian species. However, much of its biology, including its method of transmission, outside of contraction through contact with contaminated water and equipment remains, unstudied. Symptoms associated with chytridiomycosis include the keratinization of epithelial cells on adult amphibian s ventral surfaces, limbs, and feet, thus impairing the exchange of gas and liquid across the skin. Though generally fatal, recent studies have shown that some amphibian species can survive infection. Histological staining

techniques and cellular examination, using primarily Congo Red stain, were used to detect the presence of *B. dendrobatidis* in fluid preserved skin swabs collected from live *A. varius*, as well as from sympatric amphibian species. In addition, skin samples from amphibians that survive in areas where *A. varius* previously existed before 1990 were examined to assess whether the fungus persists in the environment through other amphibian hosts. In the screening for the presence of *B. dendrobatidis*, results from histological testing have thus far proven negative, showing no deleterious presence. Further testing will include molecular screening of amphibian skin samples preserved on Whatman.

P-6 Ecology.

**They Migrate, Procreate, & Regenerate The America Horseshoe Crab (*Limulus polyphemus*).** Katie Hjort, Racelle Deshaies, Gabriel Garcia-Ryan Sacred Heart University.

A population study of the American Horseshoe Crab, *Limulus polyphemus*, in Long Island Sound (LIS) has been conducted during breeding season since 1997. A comparison of original tagged animals versus recaptured data with regards to sex ratio, mating behavior, and lunar cycles was examined. An analysis of the distances traveled by tagged and recaptured horseshoe crab was also performed. Conventional cinch tagging and beach surveys were used, as well as 20 sonar tags. Sonar data was obtained from hydrophone readings from a research vessel. Analysis shows no significant pattern in east versus west horseshoe crab travel. However, strong peaks illustrating a large number of males traveled 2,000 and 25,000 meters, possibly showing a significant point in mating patterns. It was previously believed that mating behavior was closely connected with lunar cycles. But, the peak of breeding did not always occur during full and new moons and was dependent upon other environmental factors. Ninety-nine percent of the matings consisted of one male and one female. In Delaware Bay, mating in clusters was observed 40-50% of the time. On average, over the past 6 years, the male to female ratio of 60%:40% was observed.

P-7 Genetics.

**Construction of DNA Repair-Deficient E. coli Strains to Determine the Role of Mismatch Repair** in Nitrous Acid Mutagenesis. Samantha R. Cote, Sheena A. Mendez, and Suzanne M. DeschÃªnes Sacred Heart University.

Mutations can alter the helical structure of DNA, leaving it susceptible to potential compromises in its genetic stability. Mismatch repair (MMR), encoded by several genes including mutS, is the complex system that identifies and corrects insertions, deletions, and base substitutions. MMR corrects mismatches that arise from DNA replication, as well as those induced by outside sources like chemical and physical agents. Nitrous acid (NA), commonly found in hot dogs and other processed meats, is one chemical agent known to deaminate bases. When a base is deaminated, DNA polymerase may incorrectly pair bases together, which over a series of replications can produce a mutation. One enzyme found in many organisms, called EndoV and encoded by the nfi gene, plays a primary role in detecting and excising deaminated bases in order to avoid mutations. We hypothesize that when EndoV is absent, MMR will exhibit the ability to repair mismatches involving deaminated bases in DNA. To test this hypothesis, the lacZ reversion assay in E. coli will be used to determine the type and frequency of NA-induced mutations in strains that are deficient in MMR, EndoV, or both MMR and EndoV. In this reversion assay, any cells that revert back to the wild type LacZ through an NA-induced mutation will grow on minimal lactose plates. The first step in these experiments is to transfer mutant nfi or both mutS and nfi genes into the lacZ reversion strains using P1 bacteriophage transduction. Mutant DNA repair genotypes and/or phenotypes will then be confirmed. Preliminary results from these studies will be presented.

P-8 Genetics.

**Characterization of the Role of Mismatch Repair in Heterocyclic Amine Mutagenesis in Salmonella.** Kara A. Callahan and Suzanne M. DeschÃªnes, Sacred Heart University, Fairfield, CT Heterocyclic amines (HCAs) are mutagens that develop at high temperatures from the degradation of foods that are rich in proteins and amino acids. These compounds are of particular interest due to their known mutagenic and carcinogenic effects under certain metabolic conditions. Some studies suggest that a diet high in HCAs increases the risk for colon cancer. In order to become mutagenic towards DNA, HCAs are modified by enzymes in the liver and carried along the bloodstream. More than 20 HCAs have been characterized including PhIP. PhIP has high mutagenetic activity in Salmonella strains and has been linked to colon tumors in rats. The Salmonella strains in use report high mutagenic tendencies in the presence of PhIP and an S9 liver enzyme mix. In terms of repairing these mutations, the role of mismatch repair will be examined. Mismatch repair (MMR) is an important DNA repair mechanism associated with the process of DNA replication. MMR works by recognizing and replacing any base pair that is mismatched along a synthesized strand of DNA. In this way MMR plays an important role in genomic stability by depressing the survival of damaged cells and reducing the occurrence of induced mutations. MMR is known to play a role in detecting PhIP-induced DNA damage. The purpose of this research is to investigate whether MMR plays a role in

mutagenesis by other HCAs. Conditions for treating Salmonella with PhIP were first replicated in strains TA98 and TA100. The results of these experiments will be presented.

P-9 Genetics.

**Screening of GFP-tagged Protein Traps for Expression in Late-stage Spermatogenesis** Tamara Jones, Marguerite Wickman, and James Fabrizio, College of Mount Saint Vincent.

While the early stages of spermatogenesis have been extensively investigated, the later stages remain less understood and are the main focus of our research. We are in the process of screening a collection of 601 GFP-tagged protein traps, each of which is an insertion of a transposon carrying a GFP reporter into the intron of a specific gene, in order to elucidate which genes are expressed during late-stage spermatogenesis. While we have uncovered GFP expression in almost all cell types within the testis, including germline stem cells, pre-meiotic spermatogonia, and spermatocytes in meiosis, we have also observed GFP expression in later-stage germ cells, such as spermatids and spermatozoa. Moreover GFP expression was also observed in the somatic cells of the testis, including the hub, which anchors the stem cell populations of the testis, and the cyst cells, which encase the developing germline. Interestingly, GFP expression is often observed in somatic cyst cells encasing later-stage spermatids, suggesting a possible role for these proteins in soma- to-germline communication during late-stage spermatogenesis. Taken together, since it is known that the GFP expression pattern of each protein trap mirrors the expression of the endogenous protein product, we are confident that our GFP traps are indeed uncovering endogenous protein expression patterns during spermatogenesis. It is our hope that this research would represent a first step toward uncovering the genetic program of late-stage spermatogenesis.

P-10 Cell biology.

**Virtual Screening and Identification of Small Molecule Inhibitors of the Melatonin Rhythm Enzyme** Margarita Javoroncov<sup>1</sup>, L. Szewczuk<sup>1</sup>, S. Ganguly<sup>1</sup>, S. Saldanha<sup>2</sup>, R. Abagyan<sup>2</sup>, P. Cole<sup>1</sup> Dept of Pharmacology, Johns Hopkins University School of Medicine<sup>1</sup> Dept of Molecular Biology, Scripps Research Institute.

Melatonin is a serotonin derivative produced in the pineal gland of all animals and the retina of mammals. It modulates a wide assortment of circadian cycle pathways, especially those concerning sleep and mood. The biosynthetic pathway for the conversion of serotonin to melatonin is determined by the concentration of arylalkylamine-N-acetyltransferase (AANAT, serotonin N-acetyltransferase) in the pineal gland and retina. The active sites of AANAT include those for arylalkylamines and acetyl-coenzyme A. A series of competitive small molecule inhibitors were selected from 1.2 million commercially available compounds via Internal Coordinate Mechanics (ICM) virtual ligand screening. The compounds chosen came from Sigma/Aldrich rare chemicals (Salor Collection) and the National Cancer Institute repository. Virtual ligand screening, based on the energetics of ligand binding and variation of a coupled enzyme

spectrophotometric assay, was utilized to determine the inhibitory activity of each compound. Compounds that significantly inhibited AANAT were subjected to a doubling of the coupling enzyme. Additional spectrophotometric enzyme assays were run observing AANAT activity in the presence of nonionic detergent to investigate the possibility of protein aggregation and a dose response curve was generated for decreasing amounts of inhibitor. A radioactive assay was utilized to confirm AANAT activity in the absence of a coupling enzyme. Electrospray mass spectroscopy assured the presence of the predicted inhibitor. Seven compounds were found to inhibit AANAT. These small molecule inhibitors may be utilized for drug design due to their moderate potency and non-toxicity.

P-11 Experimental psychology.

**Effectiveness of Oral Administration of Nicotine through Liquid Chocolate in Rats** Christina M. Pratt, John Carroll University.

Twelve male, Long Evans rats were assigned to either a control or experimental group, and all were given liquid chocolate Ensure daily. After a three week habituation period, six experimental rats received nicotine in the chocolate Ensure, while control rats received deionized water, in amounts based on body weight. The drug period lasted for another three weeks, and one week of a withdrawal period followed. The result of nicotine administration in the experimental rats was tested by metabolic data, involving body weight, food intake, and water intake, which showed no significant differences between the two groups. Analysis of body activity revealed differences between drug and withdrawal periods, as the level of activity in experimental rats was noticeably depressed during withdrawal. Although analysis on an elevated plus maze revealed marginally significant anxiety-related behavioral differences between control and experimental rats, behavioral observations provided additional evidence for differences between groups. It was hypothesized that liquid chocolate would be an effective means of drug delivery, as seen by the results of nicotine administration in the experimental rats. Differences in body activity and behavioral anxiety were seen between groups, and thus chocolate may be an optimal vehicle for drug delivery in the form used in this experiment, to provide a safe yet effective route of drug administration. The implication of such a finding may prove useful in further research, by providing an alternative administration method in nicotine replacement therapy.

P-12 Clinical psychology.

**The Effects of Music and Gender on Hostile Thoughts and Moods in College Students.** Sarah Mayrer, Manhattan College Kelly Burns, Manhattan College Kristi Bracchitta, Ph.D., College of Mount Saint Vincent.

The effect of violence in the media has been a topic of debate in the United States for numerous years and is argued from various angles. Researchers continuously try to determine if violent music results in violence or aggression in those who listen to it. The purpose of this study was to determine if listening to violent mainstream rap music would cause more hostile thoughts than listening to non-violent rap music and to determine if gender plays a role in

level of hostile thoughts in college students. Researchers hypothesized that students exposed to the violent rap music would display higher levels of hostile thoughts than students exposed to non-violent rap music. In addition, males were expected to show higher levels of hostile thoughts than females. Lastly, it was expected that there would be an interaction between type of music and gender with males listening to the violent rap music having higher levels of hostile thoughts than any other group. One-hundred and four college students were randomly assigned to listen to either aggressive or non-aggressive rap music while completing the State Hostility Scale. Results of a 2x2 ANOVA revealed that there was a significant main effect of the type of music a person listened to and their score on the State Hostility Scale. Participants who listened to the violent rap music scored higher on aggressive thoughts. In addition, there was a significant main effect of gender; males reported more aggressive thoughts than females regardless of gender. No significant interaction was found between type of music and gender. Findings from this study could potentially allow the public to become aware of the implications that violent music has on thoughts and possibly actions, therefore possibly avoiding or limiting such exposure.

P-13 Organic chemistry.

### **Synthesis of Amide and Amine Derivatives of Benzoic Acid as Potential Inhibitors of Bcl-xL** Timothy Bush, Collin Morris, and Jay Pike, Providence College.

Cancer is the result of cells that, through mutation, gain the ability to grow unrestrained and often avoid apoptosis, or natural cell death. The mitochondrial apoptotic pathway is regulated by the Bcl-2 family of proteins, which consists of both pro-survival and pro-death members. Over-expression of Bcl-xL, a pro-survival member of the Bcl-2 family, prevents cell death by inhibiting the pro-death member, Bax, which leads to cancer progression. Antimycin A3, an antibiotic isolated from *Streptomyces antibioticus*, has been shown to bind to Bcl-xL and inhibit its pro-survival function. Computational molecular docking analysis verified that Antimycin A3 has a strong interaction with a hydrophilic loop consisting of arg100, tyr101, arg102, and arg103 in the BH3 domain of Bcl-xL, as well as a hydrophobic backbone formed by ala142, ala149, and leu150 residues. From these results, it is suggested that molecules with the capacity for hydrogen bonding to the arginine and tyrosine residues, along with a hydrophobic tail that can effectively interact with the backbone, will have stronger binding affects and may lead to the promotion of apoptosis more effectively. The purpose of this study was to synthesize and purify amides and amines derived from 5-aminoisophthalic acid and 3-aminobenzoic acid containing carboxylate functional groups for effective hydrogen bonding to the hydrophilic loop, along with an aliphatic chain that can form weak Van der Waals interactions with the backbone Bcl-xL. The details of the syntheses, purification, and characterization by NMR and IR of a series of such derivatives will be discussed in detail. These molecules may be used as pharmacological tools to better understand the apoptotic pathway, as well as serve as potential chemotherapeutic drugs for a wide range of cancers.

P-14 Behavior biology.

**Anti-Theft Behavior Used by Eastern Gray Squirrels.** Gina Rodriguez, Stephanie Collin, Allison Gaudet, Rachel Birk, Holly Bugbee, Rebecca Demers, Jennifer Dupuis, Jessica Larkin, Lauren Mattis, Kelly Nazario, Jasmine Waterman, and Sylvia Halkin, CCSU.

Department of Biology, Central Connecticut State University Eastern gray squirrels, *Sciurus carolinensis*, perform behavior that seems likely to function to reduce the chance of their buried acorns or nuts being stolen by thieves (other squirrels, crows, or blue jays). We conducted experiments to determine whether this pilferage-averting behavior became more common after squirrels experienced thefts of their buried nuts. During the first set of trials (pre-pilfering), we recorded a squirrel's behavior as it buried hazelnuts from an array we had set out in a location where squirrels were foraging naturally. In the second set (pilfering trials), a person acted as a pilferer and attempted to dig up each nut after it was buried; we recorded the squirrel's behavior as it continued to bury nuts. During the final set of trials (post-pilfering), we returned to simply observing and recording the squirrel's behavior as it buried nuts. The pilferage-averting behavior patterns most commonly used by squirrels during our experiments were covering empty sites in addition to the places where nuts had been buried, and burying nuts in inaccessible locations (under bushes or behind a fence); some squirrels also moved to locations visually obscured from observers to bury nuts. Squirrels most commonly used pilferage-averting behavior during pilfering trials, and next most commonly during post-pilfering trials, supporting the hypothesis that squirrels respond adaptively with pilferage-averting behavior when their buried nuts are threatened.

P-15 Experimental psychology.

**Effects of Social Interaction While Driving: A Test of the Attentional Hypothesis.** Maureen Custer, Joshua Andreas, and Sara Smith from Lycoming College. The present experiment tested the effects of the Attentional Hypothesis (Strayer & Johnson, 2001) by attempting to simulate everyday driving while presenting participants with social distraction. It was hypothesized that those using cell phones while driving and those interacting with a passenger in a vehicle make an equivalent amount of errors. Participants were separated into three groups and were observed during a ten minute driving simulation in which they experienced some level of social distraction. The errors were tallied on a checklist by an observing experimenter and were entered into an ANOVA test that indeed supported the hypothesis that errors occur in a car during cell phone use because of social interaction, rather than from peripherally manipulating the telephone.

P-16 Behavior biology.

**Habituation to Electrical Stimuli in Planaria (*Dugesia tigrina*).** Christopher Weaver and Gene Wong EC-BIO Department of Biological Sciences Quinnipiac University.

Classical conditioning in the planarian has been studied extensively, but an undisputed conclusion about associative learning in this organism has yet to be

reached. Previous studies have attempted to classically condition planarians by pairing an electric stimulus and the subsequent contractile response to a flash of light, or train planaria to select a particular direction in Y-mazes. In the training studies, it was noticed in passing that many planaria seemed to eventually ignore the electrical shock. This observation was also made in more recent classical conditioning work within our laboratory. To determine if planarian may be habituating to the electric stimulus, we subjected them to a brief electrical shock every 30 seconds for a total of 15 minutes. This was repeated over 3 consecutive days. The data was then reviewed to determine what proportion of the planaria population habituated to the electrical shock over the 3 day period. The results of this work have implications in classical conditioning or training of planaria through the use of electrical shocks.

P-17 Ecology.

**Tree Species Distribution in Stratton Brook State Park Based on Soil Analysis**

Tawonga Saka and Dr. Barbara Nicholson Biology Department, Central Connecticut State University.

A research study was conducted at Stratton Brook State Park in Simsbury, Connecticut to determine the factors facilitating the abundance of the tree species in this area. Four plots of 10 m X 10 m, were placed in each soil type and the trees measured and identified to species. Soil samples were collected from the center of each plot and analyzed for various physical and chemical parameters. Physical parameters measured included texture or grain size (LaMotte method) % moisture, and % organic matter. Chemical analysis involved Hach extractions and spectrophotometric determination of phosphorus, ammonia and potassium, and LaMotte extraction and colometric analysis of calcium, magnesium and iron. Soil analysis lead to the conclusion that different tree species preferred soil types with various amounts of nutrients and textures. For instance, pine species seemed to favor nutritious sandy soils in most of the Park s area.

P-18 Molecular genetics.

**Cloning *jadR1* -*jadR2* Intergenic Region Of *Jadomycin* Biosynthesis Cluster In *Streptomyces Venezuelae*.** Yevgeniy (Eugene) Statnikov and Dr. Roy H. Mosher, Wagner College.

*Streptomyces venezuelae* ISP5230 is a filamentous, Gram-positive soil bacterium that produces chloramphenicol and the polyketide-derived antibiotic jadomycin B (JadB) when grown under nutrient-limiting conditions. However, *S. venezuelae* only produces JadB when exposed to an additional environmental stress such as heat shock or toxic levels of ethanol. Two regulatory genes, *jadR1* and *jadR2*, that are divergently oriented and adjacent to each other on the *S. venezuelae* chromosome have been identified. The 651-bp intergenic region that separates *jadR1* and *jadR2* is predicted to encode promoter sequences essential for controlling the expression of both genes. To better understand the regulation of *jadR1* and *jadR2*, we propose to subclone the intergenic region by inserting it into the promoter probe plasmid pXE4 and then introducing the resulting

recombinant plasmid into *S. venezuelae*. To accomplish this goal, the intergenic region has been PCR amplified using pJV70A as a template and oligonucleotide primers that generate BglII and HindIII sites at either end of the amplicon. The identity of the resulting amplicon was confirmed by digesting with BamHI, which generated the expected 504-bp and 165-bp products. We plan to clone the amplicon by digesting it with BglII and HindIII and then ligating it to HindIII/BamHI digested pXE4.

P-19 Microbiology.

**Bacteriophage Therapy: Isolation and Identification of Lysogenic Bacteria of Propionibacterium acnes.** Stacy Azeredo Central Connecticut State University  
Michael Davis Central Connecticut State University.

Acne is a common skin disease that plagues many cohorts of society. There are many medications and topical solutions that are marketed for the treatment and prevention of the pimples associated with this disease. The approach that we use to target this skin disease is called bacteriophage therapy. A potential problem that arises with bacteriophage therapy is the potential for the integration of the phage DNA with the bacterial DNA, creating what is called a latently infected bacterial cell termed a lysogen. There are three main reasons why finding a lysogen is important. We are testing our bank of Propionibacterium acnes bacteria to separate the lysogens from non-lysogens so we have two distinct populations of P. acnes. These separate populations will be important to future experiments of extracting the phage from these sources to test the different types of phage on the different populations of bacteria. Reducing the unintentional generation of recombinant phage is also important. However, having these separate populations will prove useful when intentional recombinants are desired to create the best cocktail for treatment. To detect if there are any lysogens P acnes DNA is used to perform DNA spot blots which are probed with the corresponding phage DNA. Any hybridization that occurs with the phage DNA (probe) to the chromosomal DNA may suggest integration of that phage DNA into the bacterial chromosome, yielding a lysogen. Once a lysogen is detected, these cells will be grown up and see if they act as lysogens in culture. Our preliminary data suggests that the frequency in which we are detecting lysogens is consistent with the pre- established frequency measured for P. acnes.

P-20 Environmental biology.

**Pathological Changes in Chick Embryos Brain to Platinum Group Metal Exposure**  
Palav Trivedi Marist College Deborah Diehl Marist College Christina Goldsmith  
Marist College Zofia E. Gagnon PhD Marist College Leon Isaac M.D. St. Francis Hospital.

The concentration of platinum group metals (PGMs) in the environment has been steadily rising since the introduction of automobile catalytic converters in the 1970s. The PGMs, platinum (Pt), rhodium (Rh) and palladium (Pd), comprise the catalytic component of converters. While catalytic converters do effectively reduce emissions of carbon monoxide and nitrous oxides from automobiles, aging converters release dusts of these metals to the atmosphere, where they are

deposited along roadsides and carried to nearby water bodies. Only limited data exist concerning the effects of PGMs on reproduction, embryo toxicity, embryo development. In this study, the histopathological changes of PGM exposure in chick embryos brain were examined. The embryos were injected on the 7th and 14th days of incubation with different concentrations of Pt(IV), Pd(II) and Rh(III) or a mixture of Pt, Pd and Rh (PGM mix in saline solution.. . Metal analysis using atomic absorption spectrometer in graphite furnace mode (GFAAS) showed Pt accumulation in chick embryo brain tissues proportional to exposure concentration. Histological analysis of the brain tissues revealed dead neurons at 10 ppm Pt and calcium inclusions in 5 .0 ppm Rh exposures. Brain tissue calcification was our most important findings. The accumulation of PGMs in brain tissue and recorded histological changes suggests that the chicks undeveloped blood brain barrier is permeable to PGMs. This raises concerns regarding the implication of these metals on neural injury.

P-21 Molecular genetics.

**Expression of interleukin 5 receptor isoforms in patients with obstructive coronary artery disease** Michael Greene,(1), Deborah Leonard(1), Michael Merhige(2) (1) Academic Center for Integrated Sciences, Niagara University (2) The Heart Center of Niagara.

The goal of this study is to identify genetic markers of cardiovascular inflammation, which along with elevated cholesterol is a major factor in coronary artery disease progression. Patients in this study were referred for positron emission tomography myocardial perfusion imaging at the Heart Center of Niagara. An inflammatory gene expression array identified elevated interleukin 5 receptor alpha (IL5RA) mRNA in patients with reduced blood flow to the heart. Because polymorphisms can influence gene expression, patients were genotyped for the rs2290608 polymorphism in the IL5RA promoter. The population is in Hardy-Weinberg equilibrium with a rare allele frequency of 0.26. There was no difference in allele frequency between patients with pre- clinical and overt disease. Genotype had no effect on the expression of three alternatively spliced mRNAs encoding membrane and soluble isoforms of IL5RA. In a case-controlled design using patients with stress-induced perfusion defects, expression of the three mRNA variants was correlated with disease state. Additional studies are necessary to evaluate IL5RA expression as a marker of CAD progression.

P-22 Biological diversity.

**Exercise and Nutritional Effects on the Synthesis of Serotonin in Male and Female Athletes** Matthew Siubis - Marist College; School of Science Charles Mormando - Marist College; School of Science.

Serotonin levels were measured in the saliva of male and female athletes of the Marist College crew team using enzyme immunoassay. Because tryptophan is a precursor to serotonin and is consumed through diet, a three day dietary recall was obtained from each subject prior to each scheduled workout day. Exercise is believed to increase serotonin levels in both males and females, although males are thought to synthesize serotonin at a much higher rate. The mean

concentration of serotonin in males was found to increase over three exercises of increasing intensity, while the female s concentration of serotonin decreased over the exercise period. The overall concentration of serotonin in the male subjects at rest before exercise was 1313.5 ng/ml. After the first warm-up the concentrations increased to a value of 1422.2 ng/ml, and after the last exercise the concentrations again increased to 2069.2 ng/ml. Although the female s serotonin concentrations decreased over the three exercises, their initial concentrations on two days were higher than the males. The overall initial concentration of the females before any exercise was 1280.5 ng/ml. After the warm-up, the female serotonin levels were at a concentration of 834.0 ng/ml, while the concentration after the workout was at 601.7 ng/ml. Potential factors of correlation between the subject s diet and serotonin levels were assessed individually to link any diet differences with atypical results. Females consumed less protein, carbohydrates, Niacin, and Vitamin B6 compared to males. The higher consumption of carbohydrates, Niacin, and Vitamin B6 by males correlated with their higher serotonin concentrations. This supports the previous studies that carbohydrates, Niacin, and Vitamin B6 all contribute to increasing the serotonin concentration.

P-23 Molecular genetics.

**Molecular Mapping of IMP154 a novel insertion mutation in IMP.** Limunga Litombe and Nadine Regis Dr. James Fabrizio Manhattan College.

IGF-II mRNA binding protein (Imp) has been implicated in translocation, localization, and translational regulation. Imp is found in the genome of *Drosophila melanogaster*. In order to assess the function of Imp, previous researchers within the lab mobilized a P-element from a GFP tagged protein trap in order to generate a novel insertion mutant. A male sterile mutant, Imp154 was generated as a result of this mobilization. In the present study, we attempted to map the novel mutation by comparing the molecular nature of the original protein trap with the newly generated Imp154 mutant. While observation of the 5 end of sequences flanking the P-element show no difference in sequence between the mutant and the protein trap, sequences flanking the 3 end of the protein trap revealed a novel deletion in the Imp gene. The molecular nature of the Imp154 mutant, as well as our mapping strategy will be presented in detail.

P-24 Ecology

Patterns of White-tailed Deer Browsing in a Northeastern Hardwood Forest  
Ilana Workman, Meghan Farrell and Eric Wiener, Ramapo College.

High white-tailed deer populations impact tree regeneration in forests throughout eastern north America. However, deer impacts on various tree species have not been documented. This study compared browsing levels among sixteen common tree species in a mixed hardwood forest in the New Jersey Highlands. One seedling of each species present in each of forty-seven 154 m<sup>2</sup> circular plots were surveyed for proportion of twigs that have been browsed by deer, and results were compared among tree seedling species. Sassafras seedlings exhibited significantly higher proportions of browsed twigs than any other species. Red oak, black oak, white oak, chestnut oak, mockernut hickory and pignut hickory seedlings all exhibited significantly higher levels of

browsing than sugar maple and black birch seedlings, the two species with the lowest proportions of browsed twigs. No correlations were found between browsing, species-specific seedling and adult tree densities, or ground cover. Relatively low levels of deer browsing of sugar maple seedlings may be one of the contributing factors to the increasing dominance of sugar maple at the study site, and in the many forest tracts in the region. Conversely, species that are suffering from higher browsing levels are less likely to compete successfully with sugar maple seedlings. This is especially problematic for tree species such as oaks, which are also suffering from periodic gypsy moth outbreaks.

P-25 DNA technology.

**Cloning of PhzE: a Novel Chorismate-utilizing Enzyme.** Denis Bisson, Ze He, Central Connecticut State University.

Chorismate-utilizing enzymes are responsible for producing aromatic carbocyclic compounds, including folate, aromatic amino acids, vitamins K and E, coenzyme Q, etc. These compounds are vital for the survival of the organism. To date, chorismate-utilizing enzymes have been found in bacteria, fungi, plants, and some parasites, but not in humans. Therefore, drugs inhibiting these enzymes will differentially kill bacteria, but not affect humans. This makes chorismate-utilizing enzymes attractive targets for new generation of antibiotics. The success of sulfa antibiotics that target an enzyme in chorismate pathway has verified this strategy. PhzE is a hypothetical chorismate-utilizing enzyme whose proposed activity is to convert chorismate to aminodeoxyisochorismate. PhzE is postulated as one of seven enzymes required to produce phenazine from chorismate. Phenazines are known to have antimicrobial activity capable of providing bacteria with advantages in certain environments which makes them more opportunistic pathogens in humans and animals. Therefore PhzE is a promising antibiotics target. Herein, the first cloning of PhzE from *Pseudomonas aeruginosa* is reported.

P-26 Microbiology.

**Molecular Analysis of Staphylococcus Isolates From Whitetail Deer.** Kristen M. Snyder and Mark A. Gallo Biology Department Niagara University Niagara University. *Staphylococcus aureus* is a prevalent bacterial species found in many environmental and clinical settings. *S. aureus* is a pathogen that has become more of a problem in the clinical and agricultural setting due to antibiotic resistance. This study involves a look at the levels of antibiotic resistance in the nasal passages of whitetail deer, a source of Staph. that should not be under direct influence of antibiotic use. It is anticipated that the research will provide clues regarding antibiotic resistance and the genes involved, the types of genes found, and the prevalence and distribution of such genes in the various isolates. Physiological studies on their antibiotic resistance profiles were performed on the isolates. Successful chromosomal DNA isolation and sequencing has been performed, as well as Pulse-Field Gel Electrophoresis (PFGE) to compare the genomic composition of the different strains. A number of DNA

samples have been collected and have been analyzed via 16srRNA sequence for species identification.

P-27 Cell biology.

**The Effects of Varying Ethyl Alcohol Concentrations on Zebrafish Development: A Morphological Study.** Lauren Maltese, Christopher Corbo, Linda Raths\*, & Zoltan Fulop\* Wagner College.

Fetal Alcohol Syndrome is a disease caused by the consumption of alcohol during pregnancy. The effects of prenatal alcohol exposure often result in teratological features including facial abnormalities and central nervous system dysfunction. This experiment was performed in order to build upon previously reported data, testing if the teratological effects were evident in the developing zebrafish. The focus of this study was to characterize the cellular events during the development of the zebrafish brain. Eggs were collected right after fertilization and housed in 0.05%, 0.08%, 0.1%, and 0.5% ethyl alcohol concentrations and as control groups. Macroscopic morphological malformations were observed throughout each alcohol concentration and photographed. Every two days, beginning with the newly hatched embryo (4 days post fertilization), fry were fixed using Karnovsky's fixative, post fixed in osmium tetroxide, dehydrated through increasing ethyl alcohol concentrations, and embedded in plastic resin for light and electron microscopic observation. Plastic embedded sections of the brain were cut and stained for both light and electron microscopic analysis. Based on this study, it is evident that alcohol exposure has detrimental effects on the development of the embryos, especially in the developing brain. Due to their transparent chorion, ease of breeding and ease of maintenance, zebrafish are a very strong model organism for studying fetal alcohol syndrome.

P-28 Systemic biology.

**Exercise-induced changes in salivary serotonin concentrations in female and male endurance training.** Cristina Commesso - Marist College Eileen Glenbocki - Marist College Elizabeth Pfluger- Marist College.

Serotonin (5-hydroxytryptamine) is a central nervous system neurotransmitter, product of tryptophan metabolism, associated with many physiological functions. It has been documented that exercise enhances the synthesis of serotonin in brain tissue. In addition, exercise is believed to increase serotonin levels in females and males. In our study the serotonin levels were assessed in the saliva of 18 female and 22 male Marist College crew athletes, ages 18-22 using enzyme immunoassay. To determine the possible correlation between dietary intake and serotonin levels a three day dietary recall was obtained from each subject prior to scheduled exercise days and analyzed for caloric intake, percent of carbohydrates, proteins, fats, vitamins and minerals. Our results demonstrated that the females serotonin concentration decreased over the exercise period, while the males serotonin concentration was found to increase. The females average serotonin concentration before exercise (control) was 1280.5ng/ml, after the warm-up the concentration decreased to 834.0ng/ml and decreased again to

601.7ng/ml after intense workout. These results suggest that female athletes have a higher serotonin level than sedentary females whose normal serotonin range from 80 to 450ng/ml. The average serotonin concentration for male athletes before exercise (control) was 1313.5ng/ml. After the warm-up the serotonin concentrations increased to 1422.2ng/ml and continued to increase to 2069.2ng/ml after intense workout. These results suggest that male athletes have a higher serotonin concentration than normal sedentary males whose normal serotonin range from 40 to 400ng/ml. The comparison of female and male serotonin concentration indicate that the male s normal serotonin concentrations are lower than females. Endurance exercise stimulates the synthesis of serotonin at a faster rate in males so a higher concentration during a warm-up and after a workout was reported. While the normal serotonin values at rest were

P-29 Evolution.

**CFTR Protein Structure and its Evolutionary Relationship to other Members of the ABC Transporter Superfamily.** Caitlin Byrne, Ramapo College.

The Cystic Fibrosis Transmembrane conductance Regulator (CFTR) protein is a member of the ABC transporter superfamily and is comprised of five domains. Its two membrane-spanning domains and its two nucleotide-binding domains are characteristic of any ABC transporter, but it also contains a regulatory domain. Together these domains fold to form a chloride ion channel, which transports chloride ions through the membranes of epithelial cells. Former studies have provided evidence that CFTR s regulatory domain may be involved in regulation of other ion channels. Due to the difficulty of crystallizing the entire protein, only the structure of the first nucleotide-binding domain has been experimentally determined thus far. Many of the mutations that cause Cystic Fibrosis occur in this domain, including the most common, the deletion of a phenylalanine at position 508. The purpose of this study is to examine and illustrate the structure of CFTR and its evolutionary relationship to other members of the ABC Transporter superfamily. Several sequence and structure alignment tools were used to compare CFTR to members within and outside of the CFTR/MRP subclass. Primary structures were aligned and secondary structures were predicted for entire protein sequences. Tertiary structures of nucleotide binding domains were aligned and compared according to measures including RMSD values, hydropathy profiles, amino acid composition, and sequence identity/similarity. Together, statistical and graphical results provide clear evidence of the CFTR protein s place in the evolution of ABC transporters.

P-30 DNA technology.

**Cloning of Chorismate Lyase: an Antibiotics Target.** Christopher Pimley, Ze He, Central Connecticut State University.

The shikimate biosynthetic pathway is found in plants, bacteria, fungi, and apicomplexan parasites. It is central to the biosyntheses of a variety of carbocyclic aromatic compounds. The final product of the shikimate pathway, chorismate, is the branchpoint for the production of folate, aromatic amino acids, vitamins K and E, coenzyme Q, enterobactin, chloramphenicol,

plastoquinones, phenoxazinones, and other metabolites. The central importance of the chorismate-dependent pathways and their absence in mammals make them very attractive targets for the development of antimicrobials and herbicides. Five common chorismate utilizing enzymes have so far been characterized. These include anthranilate synthase (AS), 4-amino-4-deoxychorismate synthase (ADCS), isochorismate synthase (IS), chorismate mutase (CM), and chorismate lyase (CL). However, little mechanistic analysis has been reported on CL. To facilitate further study of CL, cloning of entC gene encoding for CL in E. coli is reported here.

P-31 Cell biology.

**Activation of Microglial Toll-like Receptors Increases Uptake & Degradation of Amyloid Beta in vitro.** Emily Babcock-Petrus<sup>1</sup>, Daniel Kerr<sup>2</sup>, George S. Merz<sup>2</sup>, Daryl S. Spinner<sup>2</sup> 1. Wagner College 2. NYS Institute for Basic Research in Developmental Disabilities.

Alzheimer's Disease (AD) is a fatal neurodegenerative disease, which affects learning, memory, and speech. An important event in the progression of this disease is the accumulation of amyloid beta (A $\beta$ ) peptides, which leads to the deterioration of brain tissue. Glial cells such as microglia are thought to play an integral part in the clearance of this harmful material, however during AD these glial cells function too slowly to impact the rapid spread of the peptide plaques throughout the brain. Identifying a mechanism that would enable microglia to work faster and more effectively in the clearance of A $\beta$  material would be an ideal way to fight the progression of this fatal disease. Toll-like receptors (TLRs) are transmembrane proteins, which enable the immune system (including glial cells) to become phagocytic and responsive to harmful material such as A $\beta$  plaques. By employing agonists for TLRs located on microglia, their effectiveness in clearing A $\beta$  plaques could be increased, resulting in less neural damage over time. This study examined the effect of microglial exposure to agonists specific for TLRs 2, 3, 4, 5, 7, or 9 with regard to A $\beta$  clearance in vitro; ligands that target these TLRs include Pam3CSK4, poly [I:C], lipopolysaccharide, flagellin, ssRNA or CpG DNA, respectively. These agonists were incubated with the cells for 24 hours prior to a 20 min exposure to aggregated FITC dye-labeled A $\beta$ <sub>1-42</sub> material. Cells were immunolabeled and analyzed using confocal fluorescence microscopy. All agonists increased the uptake and clearance of A $\beta$  by microglia versus untreated controls. Furthermore, the treated cells were able to completely degrade the neurotoxic material within 24 hours. These results suggest that TLR agonist treatment is an effective method to increase microglial A $\beta$  plaque-clearing activity, and could be an important part of future therapies for AD.

P-32 Microbiology.

**Rhodococcus equi: Spore or Non-Spore Former?** Michael Bois, Mouhammed Halwani, Edmond Kurtovic, Kathleen Bobbitt, Wagner College.

Rhodococcus equi is a facultative aerobic, gram positive, pleomorphic coccus-

bacilli. It is commonly found as the causative agent of pneumonia in foals, but also affects immuno-compromised individuals. The research conducted involves *R. equi* and its ability to form spores. A culture of *R. equi* was grown on a highly selective media called Trimethoprim-Cefoperazone-Polymyxin B (TCP). The bacterium then underwent comparison against other organisms that it is related to, as well as displaying certain attributes, which were vital to its understanding. Both *R. equi* and *Streptomyces venezuelae* were grown on Glucose Salts Media in order to see whether or not a color change would occur due to the presence of spores. *R. equi*, *Mycobacterium phlei*, *Coreynebacterium xerosis*, *Coreynebacterium pseudodoptheridicum*, and *Bacillus subtilis* were subjected to 70% EtOH in intervals of 5, 10, and 15 minutes. They were then plated and growth was compared. *M. phlei*, *C. xerosis*, and *C. pseudodoptheridicum* were selected due to their thick cell wall which would possibly allow them to survive in these conditions. *B. subtilis* was used because of its ability to sporulate, which might allow it to survive. Following these tests, samples were collected of *Staphylococcus aureus*, *B. subtilis*, *R. equi*, *C. pseudodoptheridicum*, *M. phlei*, *C. xerosis*, as well as *Rhodococcus rhodochrous*. These samples then underwent processing for Transmission Electron Microscopy, Scanning Electron Microscopy, and Light Microscopy to compare their internal and external cellular features. It was found that *R. equi* had internal structures that resembled spores. Following this, a standard spore stain yielded a small amount of spores. Acid hydrolysis spore staining will be done in order to enhance the staining of the spores. A growth curve for *R. equi* will also be done. At each growth phase, TEM processing of the sample will be done to evaluate at what time the bacterium sporulates.

P-33 Experimental psychology.

**The Effect of Floral Scent on Well-Being, Cognition, and Creativity.** Pamela Dajer, & Nancy Rader, Ithaca College.

Cummings and Tooley (2005) measured participant s responses in an unembellished, plants, flowers, or both flowers and plants condition. They found that in the floral conditions some aspects of cognition were hindered, creativity and subjective well-being enhanced and physiological stress reduced. We designed a follow-up study to determine whether the view of flowers, scent, or both were important in determining these effects. Participants were randomly assigned to an unembellished, fake flowers, real flowers, and real flowers- but out of sight condition. We hypothesized that scent is responsible for the results of Cummings and Tooley s study. Data from 70 undergraduates have been collected. Measures included heart rate, blood pressure, subjective well-being, and performance on cognitive and creativity tasks. Analyses of Variance were carried out for four dependent variables using three levels of condition: unembellished, floral smell, and fake flowers. The dependent variables included: the Happiness Quotient, Physiological Stress Reduction, Cognition Summary score, and Creativity score. It was found that the Fake Flower condition led to a decrease in happiness compared to the other conditions. There were no significant effects for the physiological stress measure. Because males and females showed a

different pattern of response, gender was added as a factor in the analysis for the creativity score. We found that females showed enhanced creativity in the floral conditions. For the Cognition Score, there was a trend towards better performance in the floral scent conditions. A follow-up t-test contrasting the two non-floral scent conditions with the two floral scent conditions found a significant difference. In keeping with our hypothesis, floral scent was related to the degree of happiness reported and enhanced creativity in females. However, our results to date do not support our hypotheses concerning the effect of floral scent on mood, stress, or cognition.

P-34 Ecology.

**Tree Health in Rock Outcrops in a Mixed Hardwood Forest.** Phil Allegro, Danielle Ersalesi, Melissa Manzella and Eric Wiener / School of Theoretical and Applied Science / Ramapo College.

This study utilized rock outcrops as testing grounds for understanding how environmental stresses, particularly elevated temperature and drought conditions, may affect tree health. A health index was determined for 771 trees > 5 cm dbh within 10 rock outcrop habitats in a mixed hardwood forest in northern New Jersey. The health of the most common species were compared to data that were collected during the previous year in eight 1-hectare plots along the mid-slope just below the rock outcrop sites. Tree species included those that are currently suffering from non-native disease and insect problems, as well as species that are not currently suffering from such problems. Tree health was also compared among the outcrops and among the mid-slope plots. Results revealed significantly lower tree health in rock outcrops for 6 of the 7 study species for which sample sizes were sufficient for comparison between rock outcrop and mid-slope plots. Significant differences in health among the outcrops existed for 4 of the 5 study species, and among the mid-slope plots for 4 of the 6 study species for which there were sufficient data. Results indicate, therefore, that health of most of the study species is affected by the environmental stresses that typify rock outcrop habitats, and that tree health often even varies among different locales of the same habitat type. This study suggests that predicted shifts in climate could significantly affect the health of many tree species, regardless of whether the species are suffering from other problems. The habitat effects in this study were subtle, however, suggesting that other factors may have greater impacts on forest dynamics. Further studies should examine the specific combination of stresses that impact each of the affected species, as well as other potentially important factors, such as soil quality, invasive species, and population genetics.

P-35 Microbiology.

**Novel Strategies for the Identification of Soil Bacteria Producing Antimicrobial Compounds.** Arlinda Carr, Faiza Aslam, Patricia Porras, Daniel LaMontagne, and Michael Davis, Central Connecticut State University. Our lab seeks new antibacterial compounds secreted by soil microorganisms,

hypothesizing that some of these may be novel compounds which can serve as antibiotics for treating human disease. We identify such candidate soil bacteria using a crowded plate technique, inoculating solid media with a thousand bacteria and isolating those that form colonies surrounded by a visible no-growth zone. This method has yielded a lab collection of hundreds of candidates for further study, but has limited us to those candidates that

inhibit other soil bacteria under the specific plating conditions employed. We have modified this standard screen in several ways designed to identify specialized candidates. One approach applies the existing crowded plate screen but uses medium buffered to pH 3. Fewer soil bacteria form colonies on such media; the proportion of them which fail to grow on standard media is being determined, but is significant. It is hoped that candidates identified with this modified screen will be different from those already in our lab collection. Another approach is directed at discovery of novel antifungal agents, for which there is an increasing need in disease therapy. A screen has been devised which seeds plates with soil bacteria forming colonies within a lawn of yeast cells (*Candida*). A nonpathogenic surrogate yeast, *C. kefir*, is used for the screen, but candidates isolated will be tested for activity against the pathogenic yeast *C. albicans*, and other fungi involved in human disease. Finally, candidates in our existing lab collection are being screened for any with the potential to treat colitis caused by *Clostridium difficile*, also known as antibiotic-associated colitis. Modifications of our standard screening tests are used to identify candidates with a narrow spectrum of action against clostridia alone. The compounds secreted by such candidates may yield useful new agents to treat this problematic condition.

P-36 Microbiology.

**Purification of Antibacterial Compounds from Soil Bacteria.** Daniel Mori, Shannon Soucy, Lorena Martinez, Chris Freda, and Michael Davis, Central Connecticut State University.

Antibiotics are chemicals that are selectively toxic for bacteria, and have been used for decades to treat infectious disease. This use, and concomitant abuse, have driven the evolution of antibiotic resistance among populations of bacterial pathogens, and common antibiotics are becoming ineffective. One strategy to deal with this problem is the discovery of new antibacterial compounds. Our lab is seeking such compounds from natural sources, soil microorganisms which secrete such chemicals to further their success in competition with other soil organisms. We have identified a large number of candidate bacteria which inhibit the growth, not just of soil organisms, but also human associated bacteria related to known pathogens. Competition tests *in vitro* indicate that some candidates produce broad spectrum agents, able to inhibit the growth of many different test species. Other candidates target a narrower spectrum of test strains. There is great need for novel antibiotics in both categories. Several candidates have been chosen for further study, based on criteria such as spectrum of action. Efforts are underway to characterize the active antibacterial compounds and, in particular, to purify those chemicals in order to determine their molecular composition and structure. Any that represent novel compounds will be further studied for their potential as antibiotics.

P-37 Organic chemistry

**Attempts Towards Catalytic McMurry Coupling Reactions.** Jeanette Drapo, Ronny Priefer, Niagara University.

Due to the increase in the number of pathogenic bacteria, a novel compound that exhibits antibiotic activity through the mechanism of non-specific membrane disruption would be advantageous. Phenol derivatives have shown activity against both gram-positive and gram-negative bacteria, but no comprehensive structure-activity-relationship (SAR) study has been undertaken. This work incorporates the values of pKa and log P to develop an equation for estimating anti-microbial activity of para-substituted phenol derivatives. By monitoring zone of inhibition at multiple phenol concentrations, the activity of the compound is determined ( $\text{Activity} = \text{ZI}_{\text{max}} / \text{KZI}$ ) using the Prism 3 (GraphPad Software, San Diego, California, USA) program. This determination of activity is compared to the minimum inhibition concentration (MIC) procedure. A correlation has been observed for both pKa as well as log P with respect to activity.

P-38 Cell biology.

**Calcium Regulation in Cardiac Muscle of the Southern Kingfish.** Rebecca Ryznar and Cheryl Watson, Central Connecticut State University.

Recent physiological investigations examining the cardiac calcium handling abilities of tuna and rainbow trout suggest increased reliance on sarcoplasmic reticulum calcium contribution for heart contractility that is both temperature and frequency dependent. Both of these fishes, more so tuna, have a high recorded heart rate compared to other species. There is also evidence to suggest that there is an increased SERCA-2 protein content which allows for more calcium uptake and ATPase activity in tuna. Of late it has been discovered that the southern kingfish, a species with a relatively modest lifestyle not requiring exceptional cardiac output function, produces a heart rate comparable to the most rapid rates observed in tuna and trout. Analyzing previous findings of SR calcium contribution in other fish with noted high heart rates, it seems that the southern kingfish is utilizing this mammalian like capability as well. In order to evaluate this hypothesis, cardiac function of isolated cardiac strips from the southern kingfish and croaker has been assessed in the presence of a low concentration of ryanodine (a biphasic compound which will either permanently block or open the ryanodine receptor) and epinephrine. Expression of specific excitation contraction components are examined for southern kingfish, tuna and croaker using immunofluorescent staining of sarcolemmal calcium ATPase, ryanodine receptor, L-Type calcium channel and phospholamban. Future experiments are discussed including additional force frequency experiments assessing cardiac function of southern kingfish and croaker in the presence of a high ryanodine concentration.

P-39 Microbiology.

**Structure-Activity-Relationship Profile of Para-Substituted Phenols as Anti-Microbial Agents.** Jeffrey St. Denis, Walter Steiner, Ronny Priefer, Niagara University.

Due to the increase in the number of pathogenic bacteria, a novel compound that exhibits antibiotic activity through the mechanism of non-specific membrane disruption would be advantageous. Phenol derivatives have shown activity against

both gram-positive and gram-negative bacteria, but no comprehensive structure-activity-relationship (SAR) study has been undertaken. This work incorporates the values of pKa and log P to develop an equation for estimating anti-microbial activity of para-substituted phenol derivatives. By monitoring zone of inhibition at multiple phenol concentrations, the activity of the compound is determined ( $\text{Activity} = \text{ZI}_{\text{max}} / \text{KZI}$ ) using the Prism 3 (GraphPad Software, San Diego, California, USA) program. This determination of activity is compared to the minimum inhibition concentration (MIC) procedure. A correlation has been observed for both pKa as well as log P with respect to activity.

P-41 Molecular genetics.

**Expression and Purification of Bcl-xL for the Study of Potential Antagonists.**

Katherine Mattaini, Eileen Nicoletti, and Jay Pike, Providence College.

Cancer is the uncontrolled dividing of cells caused by mutations within the cell that, consequently, deregulate apoptosis. One mechanism of deregulation is the over-expression of Bcl-xL, an anti-apoptotic protein that dimerizes with Bax, a pro-apoptotic protein, inhibiting natural cell death. The overall goal of this research project is to synthesize small molecules that bind to Bcl-xL, reinstating the functionality of Bax. In order to do so, Bcl-xL must be isolated so that competitive binding assays can be set up using these small molecules. Expression of the Bcl-xL protein is accomplished using a pET-16b plasmid with a HIS-Tag. Purification is accomplished via a PrepEase Ni-IDA Column and the protein is eluted using an imidazole-containing buffer. Expression of the protein is determined by SDS-PAGE and Western blot analysis.

P-42 Theoretical chemistry.

**Molecular Modeling and Computational Analysis of Antimicrobial Ability of Para-Substituted Phenols.** Mallory van Dongen, Mary McCourt, Ronny Priefer, Niagara University.

Phenol is a known antibacterial reagent. Recently a study has been carried out in which phenol derivatives with various side chain substitutions have been used as possible antibacterial reagents. The purpose of that study was to develop a comprehensive structure-activity-relationship (SAR) analysis of these phenol derivatives. Side chains were modified to include chain extension as well as modification to include nitrogen, oxygen, or halogenation. The efficiency of the antibacterial system was correlated to the side chain structure. SYBYL running on an HP1230 was used to develop a computational and structural analysis of these phenol derivatives. MOPAC charges were calculated to determine an electrostatic rationale for the efficiency of side chains. The objective of this computational study is to formulate a mathematical model to predict the antibacterial activity of substituted phenols.

P-43 Microbiology.

Structure-Activity-Relationship Study of Tetrabutylammonium Counter-Anions as Antimicrobial Agents Michelle Ingalsbe, Walter Steiner, Ronny Priefer, Niagara University.

Due to the increasing number of strains of drug-resistant bacteria, the development of new antibiotics has become ever more important. The antibacterial abilities of quaternary amines and their derivatives have been well known for many years on both gram-positive and gram-negative bacteria. However, an encompassing study of the Structure-Activity-Relationship (SAR) with specific emphasis on the role of the counter-anion has not been reported in the literature. By monitoring the Zone of Inhibition at various concentrations of tetrabutylammonium salts, a comparison of the counter-anions can be observed. For this study, activity is reported as  $\text{Activity} = \text{ZImax}/\text{KZI}$  using the Prism 3 (GraphPad Software, San Diego, California, USA), which has been shown to be an excellent method of determining anti-microbial efficacy of these salts.

P-44 Cell biology.

**Isolation of Calcium Tolerant Cardiac Myocytes.** Owen Grove, Justin Goralnik, Cheryl Watson, Central Connecticut State University.

The objective of this project is to isolate calcium tolerant adult cardiac myocytes for use in tracking calcium fluxes in response to Angiotensin II. Briefly, the method used for isolation requires cannulation of the adult rat heart followed by perfusion with 1) a calcium-free Ringer's solution 2) collagenase to disrupt the extracellular matrix and 3) a high potassium Ringers solution which mimics the ionic composition of intracellular fluid. The heart is minced in this solution and triturated to separate cells. The isolated cells are tested for viability using trypan blue exclusion and counted using a hemocytometer. After two hours their calcium tolerance is tested by placing the cells into standard calcium containing Ringer's solution. Cells that are able to contract and relax, thus able to maintain intracellular calcium balance are considered viable. These cells will be used to measure changes in calcium flux in myocytes in response to Angiotensin II using calcium sensitive dyes.

P-45 Organic chemistry.

**Thermolytic and Photolytic Behavior of Dialkoxy Disulfides.** Ryan McCloskey, Ronny Priefer, Niagara University.

The dialkoxy disulfide moiety (R-OSSO-R) has been known for over 40 years. Studies have been performed on molecules containing this functionality which illustrates its ability to liberate trappable S<sub>2</sub>. The mechanism is believed to go through an intramolecular concerted heterolytic cleavage pathway. Recently published work has put this hypothesis into question. To examine this, we have exposed this compound to both thermolytic and photolytic conditions to reveal this molecule's intrinsic properties. By understanding how this functionality behaves under various conditions, it may be possible to liberate not only S<sub>2</sub> but SO.

P-46 Microbiology.

**Evaluation of the Antibacterial Efficacy of Mono-Substituted Aniline Derivatives**

John Cadwalader, Walter Steiner, Ronny Priefer, Niagara University.

Since the discovery of penicillin in 1929, bacteria have evolved in response to

a bombardment of antibiotic chemicals. These surviving bacteria are making modern antibiotics obsolete, due to their ability to survive the drugs that were once effective. New antibiotics must be created in order to counteract these new strains of bacteria. Aniline derivatives have shown antibacterial characteristics against gram-negative and gram-positive bacteria. An extensive Structure Activity Relationship (SAR) study of aniline and its derivatives has yet to be undertaken, despite the promising potential that they have shown. Due to the aromatic nature of aniline, derivatization can be added in multiple positions (ortho, meta, and para). By exposing mono-substituted aniline compounds to gram negative, and gram positive bacteria, a zone of inhibition can be measured. The zone of inhibition curve is factored into an equation  $\text{Activity} = \text{ZIMAX} / \text{KZI}$ , (Prism 3 program, GraphPad Software, San Diego, California, USA) which gives a numerical value of the antibacterial efficacy of each aniline derivative. The numbers derived from this formula are used to rank the efficacy of these aniline derivatives from greatest to least, and thus the nature of the substituents can be evaluated.

P-47 Cell biology.

**Expression of Connexin 43 Gap Junctional Protein in Rat Cardiac Fibroblasts.**

Katelynn Ferranti, Michael Dugo, Annie Fisher, Jesse Gomes, Lisa Ton, Cheryl Watson, Central Connecticut State University. Cardiac tissue remodels in response to increases in hormones, specifically

Angiotensin II. Angiotensin II stimulates the proliferation of cardiac fibroblasts, the cell type that produces the extracellular matrix surrounding the cardiac myocytes, the contractile cells of the heart. Recent studies suggest that cardiac fibroblasts may alter their function as well as their number during cardiac remodeling. Our aim in this project is to determine if cardiac fibroblasts exposed to Angiotensin II may become electrically coupled by increasing expression of connexin 43, a gap junctional protein. Cardiac fibroblasts of neonatal or adult Sprague-Dawley rats were isolated using the Worthington Neonatal cardiomyocyte isolation system. This method includes obtaining the hearts and incubating them with trypsin and collagenase. Myocytes were discarded after fibroblasts were isolated and adhered to culture plates. Fibroblasts were used through no more than three passages. After treatment with Angiotensin II (1 micromolar concentration), control and treated cells were lysed and assessed for connexin 43 using Western blot techniques.

P-48 Cell biology.

**Can cardiac sodium channel be tyrosine phosphorylated?** Francisco Ramirez and Cheryl Watson, Central Connecticut State University.

Tyrosine kinases are a group of protein kinases that phosphorylate proteins at tyrosine residues. Such a modification to the sodium channel in ventricular muscle could alter open times of the channel, potentially allowing a longer depolarization phase and altering cardiac rhythm. We are investigating the potential for tyrosine phosphorylation of the cardiac sodium channel in Sprague-Dawley rats by several methods including 1) immunoprecipitation of

tyrosine phosphorylated cardiac proteins followed by Western blot of sodium channel 2) immunocytochemistry of colocalized tyrosine phosphorylated proteins and sodium channel, and 3) recording electrocardiograms in anesthetized rats following treatment with sodium orthovanadate, a tyrosine phosphatase inhibitor which should unmask all native tyrosine kinase activity. By using these three methods we expect to determine the extent of tyrosine phosphorylation of cardiac sodium channels and some of its effects on cardiac rhythm.

P-49 Molecular genetics.

**Characterization of suppressor genes interacting with the polyamine biosynthetic pathway in yeast.** Brandon Taylor, Michael Cianfrocco, and Charles Toth, Providence College.

A yeast strain was created that is dependent on expression of the human ornithine decarboxylase (ODC) gene for viability in the absence of exogenous polyamines. Induction of antizyme (AZ) expression in the strain results in the loss of viability. To understand the regulation of polyamine biosynthesis and the role of AZ in the process, a yeast cDNA overexpression library was transformed into the strain to isolate suppressors that restore a viable phenotype. Seventy suppressors were isolated and library plasmids from the clones were rescued and sequenced to identify the expressed gene. Identification of the suppressor sequences using a *Saccharomyces* genome database identified thirteen individual genes many of which are involved in metabolic pathways. One gene isolated, *met17*, was chosen for further analysis due to the overlap between the polyamine and sulfur amino acid synthesis pathways. To examine the role of the *met17* gene in polyamine regulation, PCR primers were designed for targeted disruption of the *met17* locus. The PCR product for disruption was transformed into the parental yeast strain. The strain is currently being characterized for loss of *met17* expression and will be screened for polyamine sensitivity in the presence of AZ. Also, two additional genes in the pathway- *met2* and *met6*- were chosen for overexpression to determine if upregulation of the methionine pathway itself suppresses the AZ phenotype. Plasmids were obtained for *met2* and *met6* for transformation into the ODC/AZ strain. Work is currently in progress to test the *met17* knockout and *met2* and *met6* overexpressing strains. Supported by BRIN/INBRE Grant # P20 RR016457 from the NIH.

P-50 Organic chemistry.

**Studying the Mechanism of the Inhibition of *Entamoeba histolytica* Alcohol Dehydrogenase 2.** Katharine Skaar and Jay Pike, Providence College.

*Entamoeba histolytica* is a protozoan parasite responsible for amoebiasis, afflicting millions worldwide and causing 50,000-100,000 deaths annually. Currently, treatment with metronidazole is the only effective treatment. Metronidazole is reduced by ferredoxin and the reduced form disrupts the helical structure of DNA, halting nucleic acid synthesis. Because of this mechanism, metronidazole is considered carcinogenic by the International Agency for Research on Cancer. Therefore, new amoebicidal compounds need to be developed, whose function is very different from that of current drugs. The purpose of this

proposed research is to study *Entamoeba histolytica* alcohol dehydrogenase 2 (EhADH2), a glycolytic enzyme in *E. histolytica* that is required for *E. histolytica* growth and survival. Previous studies have found that cyclopropylmethanol and cyclobutylmethanol are effective inhibitors of EhADH2. However, the mechanism for their antagonistic properties is uncertain. In order to understand the mechanism, a series of derivatives of cyclopropyl- and cyclobutylmethanol will be synthesized and their inhibitory effects studied. We report here on the initial synthesis of halogenated derivatives. The synthesis and characterization of these derivatives will be discussed. The understanding of this mechanism will lead to a novel alternative target for less toxic chemotherapy against amoebiasis.

P-51 Cell biology.

**Isolation Of Membrane Proteins From Axon-Rich Fractions Of Embryonic Chick Forebrain Explant Culture.** James Clancy, Amy Chase, and Mark Jareb, Department of Biology, Sacred Heart University.

Neuronal polarity refers to the compartmentalization of neurons into distinct functional and structural domains. At a minimum, neurons are polarized into axonal and somatodendritic domains. The development of distinct axonal and dendritic domains is essential for many fundamental neural functions such as axonal pathfinding, synapse formation, and synaptic transmission. A central mechanism underlying this functional polarity is the segregation of membrane proteins to one domain or the other. The mechanisms underlying the polarization of axonal proteins are not well understood due to the limited number of proteins studied thus far. To help identify additional axonal proteins using a more global approach, we have isolated membrane proteins from axons emanating from explants of embryonic chick forebrain cultured on laminin-coated coverslips. When cultured from embryonic day 8 or 9 chicks approximately 15% of the explants develop a circumferential array of axons relatively devoid of migrating neurons or glial cells. Following microdissection of the cell body-rich explant, the remaining, adherent axons were scraped into lysis buffer containing protease inhibitors. Membrane proteins were solubilized in detergent buffer and then precipitated and concentrated. Protein derived from axon-rich fractions from multiple experiments were pooled and compared on two-dimensional gels to proteins harvested from the cell body-rich fractions to identify novel proteins that are expressed more highly in axons.

P-52 Organic chemistry

**Work Towards the Total Synthesis of Two Isoflavonoids Found in the Erythrina Genus.** Vincent M. Carroll, Ronny Priefer, Niagara University.,

Flavonoids, isoflavonoids, and neoflavonoids are compounds that are well known for antibacterial, anti-inflammatory, antipyretic, and antiseptic agent. The vast abundance of these compounds in nature, their variety, and their relatively low toxicity compared to other active plant compounds, mean that many animals, including humans, can ingest significant quantities in their diet without any adverse side effects. The beneficial effects of fruits, vegetables, tea, or even

red wine have been attributed to flavonoid compounds rather than to known nutrients and vitamins. Our current research focuses primarily on the genus *Erythrina*, which has proven to be a fruitful source of species containing antimicrobial agents belonging to various flavonoid structural classes. 5,7,4-trihydroxy-6-(3,3-dimethylallyloxiranylmethyl) isoflavone and 5,4-dihydroxy-8-(3,3-dimethylallyl)-2-methoxyisopropylfuran [4,5,6,7]isoflavone are initially being synthesized with derivatives planned to maximize their antimicrobial properties.

P-53 Environmental biology.

**Analysis of Heat Shock Proteins in a Tropical Snail, *Cenchrithis muricatus*, using 1-D Gels and Western Blotting.** Amanda Battaglia, Marie Reilly, Mark L. Botton, Mary G. Hamilton (Fordham College at Lincoln Center) and Michael Judge (Manhattan College).

The following experiment was performed in order to study heat shock proteins in *Cenchrithis muricatus*, a tropical snail found in areas with temperatures in excess of 40°C. Samples from the foot tissue were acquired at several time increments at two sites that differed in temperature exposures. The tissues were homogenized in a buffer containing a non-ionic detergent. The protein extracts were analyzed by 1-D gel electrophoresis in SDS-PAGE gels. After western blotting, indirect immunodetection was performed with a mouse monoclonal antibody against bovine Hsp 70 that recognizes all proteins in the Hsp 70 family, both constitutive and induced. Gels showed distinct bands with molecular weights of 88, 84 and 60 kDa. Two minor bands, 77 and 81 kDa, were also observed. Densitometric analysis showed changes in the relative amounts of the 84 and 88 kDa components with exposure time and between two collection sites. At site B (less sun), after four hours, the 88 kDa component was greatly reduced, and only the 84 kDa protein was seen. At later times the 88 kDa component reappeared. At site D (more sun), the decrease in the 88 kDa component occurred only after 16 hours. That is, the pattern of bands obtained in the 4 h sample at site B resembled the 16 h sample at site D. Thus, our results show a shift in the ratio of the two main components with time of exposure at two different sites, but interpreting these results requires a better identification of the two components. We are now comparing pure Hsp70 and Hsc70 with two antibodies, the one that recognizes both constitutive and induced that we used in our snail study, and a recently acquired one that recognizes primarily the constitutive Hsc70. We plan to reanalyze our samples with both antibodies.

P-54 Ecology.

**Islands in a sea of concrete; urban forest fragments as important stopover sites for migrating birds.** Boyles, M.\*, Mortali, M.\*, and Pierce, B. Biology Department, Sacred Heart University Fairfield.

During their biannual migrations, many birds stop to rest and refuel at areas known as stopover sites. A number of these stopover sites are found in coastal areas and are being threatened by human development. Thus, these stopover sites are small islands of forest located amidst urban sprawl. Currently, little is

known about the use of stopover sites in urban areas by birds during migration. In this study we compare migratory bird use of a small fragment of forest (90 acres) located in an urban setting, (VMP) to a small fragment of forest (89 acres) located in a rural setting, (KWRS). Our analyses examined species richness, species diversity, equitability and avian body condition (fat score) at each site, during fall of 2005 and 2006. The average capture rate (birds/net hour) and species richness were higher at VMP (1.5 b/nh; 32, respectively) than at KWRS (0.3 b/nh, 28, respectively) in 2005, however, species diversity and equitability were lower at VMP ( $H=2.29$ ,  $J=0.66$ , respectively) than at KWRS ( $H=2.81$ ,  $J=0.84$ , respectively). In 2006, the average capture rate was also higher at VMP (0.84 b/nh) than at KWRS (0.42b/nh) however species richness was greater at KWRS (30) than at VMP (22). Similar to 2005, species diversity and equitability were lower at VMP ( $H=2.39$ ,  $J=0.78$ , respectively) than at KWRS ( $H=2.24$ ,  $J=0.66$ , respectively) in 2006. We also found that birds using VMP had higher fat scores on average in both 2005 ( $1.44 \pm 0.1$ ) and 2006 ( $1.48 \pm 0.1$ ) than birds using KWRS both years 2005 ( $0.7 \pm 0.1$ ) and 2006 (0.85). Our findings suggest that urban fragmented forests may be as important to migrating birds as rural forests in that birds may rely on small, scattered forest fragments to rest and refuel. Thus, the protection of urban forest fragments is critical for migrating birds.

P-55 Behavior biology.

**Effects of Orally Administered Methylphenidate on Rat Metabolism, Circadian Rhythms, and Behavior.** Stacey Resavage. Department of Biology, John Carroll University.

Effects of Orally Administered Methylphenidate on Rat Metabolism, Circadian Rhythms, and Behavior. Stacey Resavage, John Carroll University The purpose of this experiment was to investigate the effects of orally administered methylphenidate on metabolism, circadian rhythms, and behavior in rats.

Methylphenidate is used to treat the symptoms of Attention Deficit Disorder and Attention Deficit/Hyperactivity Disorder. Methylphenidate is a psychostimulant used to help increase focus and control behavior. Twelve male Long Evans rats were placed in individual cages in a 12hr/12hr light/dark cycle. The animals were implanted with transmitters to monitor body temperature and activity during the experiment. The experiment was divided into three periods: habituation, drug administration, and withdrawal. After habituation, the animals were divided into control and experimental groups. The experimental animals were given a 15mg/kg dose, based on the previous day body weight, of methylphenidate mixed into 500 $\mu$ l of condensed milk, while the control animals received a comparable amount of deionized water mixed into the treat. Both groups of animals were tested on an elevated plus-maze once during the drug period and once during the withdrawal

period to test the effects of methylphenidate on rat behavior while in a stressful situation. Methylphenidate caused a significant decrease in the mean body weight, mean food intake, and mean water intake for the experimental group. Methylphenidate did not affect body temperature and activity rhythms. The drug also increased the number of fine movements in the plus-maze upon initial

exposure to the maze. In addition, it caused a decrease in the distance traveled in the closed arm during the drug period and an increase in the distance traveled in the closed arm of the plus-maze during the withdrawal period. In summary, the effect of orally administered methylphenidate on rat metabolism and behavior was significant, but insign

P-56 Organic chemistry.

**Synthesis of PVPh Derivatives as well the Multilayer Film Preparation from Aqueous Media.** Vincent M. Carroll, Megan A. Baumler, John C. Cadwalader, Jeanette R. Drapo, Michelle L. Ingalsbe, Matthew S. Pinto, Mallory A. van Dongen, and Ronny Priefer, Niagara University.

The synthesis of poly(4-vinylphenol) derivatives, as well as preparing multilayered films of these polymers is reported. The phenol moiety stretches the limits of polyanionic polymers that can be incorporated into multilayer films. The adsorption of PVPh from an aqueous media has been successfully accomplished. Multilayered films of the phenol-based polymers have been prepared using the layer-by-layer assembly technique. The film growth was followed by UV-Visible spectroscopy, while the thickness, roughness, and surface morphology of the films have been examined using interference microscopy and atomic force microscopy. The aromatic character, very weak acidity, and hydrogen bonding capability of 4-vinylphenol and derivatives yield polyelectrolytes with a rich suite of chemical and physical properties that are much different than most traditional weak polyanions. The synthesis of new poly(4-vinylphenol) derivatives were accomplished from the corresponding benzaldehyde starting materials via a 6 step process. The incorporation of these polymers into multilayer films is currently under investigation.

P-57 Cell biology.

**Vesicular Packaging Follows Serotonin Uptake in Primary Culture Rat Astrocytes.**

Alexander Ferrazzoli and Cheryl Watson, Central Connecticut State University.

Abnormalities in the synaptic concentration of serotonin are often linked to psychiatric disorders. This concentration of serotonin is regulated, by serotonergic neurons, through a cycle of serotonin synthesis and vesicular packaging, via VMAT, calcium-mediated exocytosis, reuptake via SERT, degradation via MAO, and repackaging in vesicles. Astrocytes are known to contribute to the regulation of synaptic serotonin concentration through the uptake of serotonin and subsequent degradation. This uptake is known to be Na<sup>+</sup>-dependent and fluoxetine sensitive. This project began by investigating the uptake of serotonin in primary culture astrocytes. Astrocytes are dissociated from 1-3 day old rat pups, cultured for approximately 10 days, and then exposed to 0.3  $\mu$ M serotonin for 5 hours. Immunofluorescent microscopy results have uncovered localization of serotonin in astrocytes after uptake. This localization may be due to packaging in vesicles via VMAT. We have probed GFAP-positive astrocytes with antibodies for serotonin and VMAT, and found co-localization of both. We are currently verifying the presence of VMAT through amplification of the VMAT transcript by RT-PCR. These results suggest that astrocytes may be capable of

packaging serotonin after reuptake. These studies may help uncover novel pharmaceutical targets for the development of treatments for serotonin-related psychiatric disorders.

P-58 Plant Biology.

**Incorporating multiple years of xylem growth decreases estimated xylem hydraulic Resistance.** Yasmine Ramadhan and Peter Melcher, Ithaca College.

The xylem tissue of plants contains both living and dead cells. The hollow conduits used for long-distance sap transport from the soil to the leaf are comprised of interconnected dead cells called vessels or tracheids. These conduits are well known for their passive role in water transport. It is generally assumed that these conduits have two hydraulic states; either they transport water at a constant resistance or are blocked by embolism. It is also well known that plant performance is directly related to plant water status and xylem hydraulic resistance is an important determinant of water supply to leaves and thus can constrain rates of photosynthesis and growth. Previous estimates of xylem hydraulic resistance have been measured to characterize plant adaptation to water availability. Measurements of xylem hydraulic resistance generally rely on perfusing solution through excised plant tissue. Here we show that a new measurement protocol can eliminate errors that result from opening non-functional flow paths when hydraulic measurements are made on excised tissues that contain multiple years of xylem growth. Here it is argued that this non-trivial issue greatly compromises our ability to fully characterize xylem properties in plants and make it difficult to fully understand how plants manipulate their hydraulic architecture to optimize performance. Measurements were made on both diffuse and ring porous species. We found that current values of xylem hydraulic resistance measured on plants that do not occlude their old xylem with substances such as gums, resins and tylosis greatly underestimate the true hydraulic resistance experienced within the intact hydraulic system of plants.

P-59 Theoretical psychology.

**Sensation Seeking and Gender Differences in the Context of Psychostimulant Use.**

Meg Gardner, John Smith, Ali Cohen, Stephanie Donahue, and Jamie Primavera, Ithaca College.

Sensation seeking has been a topic of many of studies in recent years. The majority of research indicates that sensation seeking is positively correlated with risk taking activities such as illicit drug use (Ball & Zuckerman, 1992). Additional research has shown males are higher in sensation seeking than females (Bronson & Howard, 2002). This study examines the relationships among sensation seeking, gender, and psychostimulant use in an undergraduate college population consisting of 295 students (males = 80, female = 215). Subjects were recruited to complete an anonymous survey of approximately 105 items and scales in either a paper/pencil or computer format. Individuals who illicitly used psychostimulants were found to be higher in sensation seeking than others. This result demonstrates patterns of sensation seeking associated with drug use that

are consistent with our predictions, though generalizations about existing gender differences did not apply to our sample. The results also showed that women ( $M = 27.29$ ,  $SD = 4.29$ ) were higher in sensation seeking than men ( $M = 29.96$ ,  $SD = 4.08$ ), which is atypical relative to findings in previous studies (Bronson & Howard 2002). The present study creates the impetus for future investigation of the topic.

P-60 Experimental psychology.

**Self-Reports of Perfectionism and Drug Use: The Impact of Survey Format.** Su Ece Erturk, Melissa Kassimatis, Rebecca Sussman, and Katherine Nolan, Ithaca College.

Researching socially sensitive issues is an important scientific and health priority. Previous research suggests that the format in which participants is tested, or in the way questions are phrased has an impact on socially sensitive self-report responses. For example, questions regarding drug use, sexuality, and illegal behavior in general are prone to these effects. Prior research suggests that individuals report higher levels of drug use when responding to computer versus paper surveys (Turner et al., 1998). The present study seeks to explain these differences by assessing self-reported personality scores. Participants were questioned about socially sensitive issues in two formats, computer versus paper. Reports of drug use trended higher in the computer format. In this format, respondents also reported lower levels of perfectionism suggesting that the diminished self-evaluations of perfectionism. Implications of these results, along with suggestions for future research, will be discussed.

P-61 Environmental biology.

**The Effect of Turbidity at Farm River Estuary (Long Island Sound) on *Fundulus heteroclitus*.** T. Raftery, L. Meo, S. Rabau, A. Carolan, A. Stonionis, C. Coleman, J. Sider, K. Campbell, And L. A. E. Kaplan Quinnipiac University School Of Health Sciences.

Investigation of Farm River Estuary indicates relatively few *Fundulus heteroclitus* (mummichogs) present, and relatively high turbidity range and magnitude (13.8 JU average and 25.1 JU range). Mummichogs are commonly used bioindicators of estuarine health, and contribute to the stability of an estuary by playing a central role in food webs as either predator or prey items. Their absence is noteworthy and suggests that high turbidity may have an effect on populations at this site. Mummichogs were collected from Milford Point CT, depurated for 28 days, and randomly placed into four tanks. Laboratory turbidity levels (0 JU, 5 JU, 16.5 JU, 28.9 JU), based on fall 2006 field values, were established using Farm River sediment and remained significantly different throughout the exposure period ( $p < 0.001$ ). Within the 55-day exposure period, tank 4 mortality and morbidity were significantly different from control levels. Fish in tanks 1 and 2 found food faster than tanks 3 or 4 ( $p < 0.01$ ). In general, fish appeared to prefer the right side and bottom zone of the tank, suggesting the existence of microenvironments. These observations are consistent with the expected behavior of the fish. In their natural environment, these fish

are found hiding under outcrops, and settle near channel edges away from the strongest flow patterns; very rarely are they found at the surface (unless feeding). Laboratory data indicate that turbidity impacts mortality, morbidity, and time to find food. Overall, data suggests that turbidity may be a key factor in preventing mummichogs from fully populating Farm River Estuary and serving as a bioindicator of estuarine health. RNA/DNA ratios as well as protein work remains to be completed from these samples, but it is clear that future studies are warranted, and will involve increased sample sizes as well as caged experiments to validate laboratory observations.

#### P-62 Vertebrate Biology

**Estimating speeds of dinosaurs: a re-evaluation of assumptions.** Melissa Manzella and Emma C. Rainforth, Environmental Science, Ramapo College.

For 30 years paleontologists have estimated dinosaur speeds from trackways, using equations determined by Alexander (1976); the fundamental assumption, based on limited observations, was that dinosaur leg length is approximately four times foot length. Thulborn (1990) subsequently determined that the leg length:foot length ratio ranges from 4.5-6.0, according to type and size of dinosaur. Given that the focus of many published footprint studies is to estimate dinosaur speed from Alexander's equations, it is critical that the leg length of the trackmaker can be ascertained from the footprint measurement: if there is high variability in the leg length:foot length ratio within a group of dinosaurs, speed estimates are going to be extremely unreliable. This study was conducted to determine the nature of the correlation between dinosaur leg length and foot length, and if a leg length:foot length ratio exists that can be used for all dinosaurs. Measurements were taken from over 45 specimens from museum collections; however, due to incomplete data (missing bones), only 24 specimens were used for analysis. Groups represented were ornithischians (bipedal and quadrupedal), theropods, dinosauriforms, birds, and sauropods. Leg length is defined as femur + tibia + metatarsal III; foot length is that part of the foot that is preserved in footprints (digit III phalanges + metatarsal III & metatarsal IV). We compared leg and foot lengths and found that in bipedal ornithischians the ratio is ~6-7, and in theropods, ~3.5-6. There is no correlation between size of the dinosaur and the ratio (contra Thulborn 1990). These ratios are also more variable, and generally greater, than either Thulborn or Alexander's results. We conclude that estimating speeds of dinosaurs from their trackways should be undertaken with caution, and that results be taken with a pinch of salt. Alexander, 1976, *Nature*, 261:129. Thulborn, 1990, *Dinosaur Tracks*, Chapman and Hall.

#### P-63 Molecular genetics.

**RNA editing in voltage-gated ion channels.** Jason Bannock, Central Connecticut State University, Barry Hoopengardner, Central Connecticut State University.

A-to-I RNA editing is catalyzed by the ADAR family of enzymes. The modifications in the RNA sequences caused by ADARs are post-transcriptional and RNA editing is not present in every transcript. This leads into our work on quantifying the frequency of RNA editing over time in the slowpoke potassium channel of *Drosophila melanogaster*, with comparative data in the cacophony calcium channel

in *Apis mellifera* the honey bee, *Camponotus pennsylvanicus* the common carpenter ant, and *Pogonomyrmex barbatus*, the red harvester ant. Through these comparative studies we hope to see consistencies that would lead us to investigate the possible targeting of a particular ion channel in pesticide development. The ultimate goal of our work is to use the information gained from the studying of ion channels to develop species specific pesticides that work on ion channels that edit at a high or low frequency depending on the species.

P-64 Genetics.

**Common Sequence motifs for recombination hotspots in *Schizosaccharomyces pombe*.**

E. Riegelman, W. Steiner, E. Steiner, Department of Biology Niagara University.

Genetic recombination is an important mechanism for increasing genetic diversity in organisms. Also, recombination is important for correct segregation of chromosomes during meiosis. In the absence of recombination, chromosomes segregate randomly, resulting in primarily inviable gametes or spores.

Recombination occurs primarily at a number of discrete chromosomal sites termed hotspots. The factors that determine the location of hotspots is poorly understood. However, at least some hotspots, and perhaps many, are determined by defined nucleotide sequences. For example, the 7 base sequence 5'-ATGACGT-3' (M26) is responsible for multiple hotspots in the genome of the fission yeast *Schizosaccharomyces pombe*. My research to date has dealt with finding additional sequence motifs that create recombination hotspots. I have analyzed more than 300 30 base-pair (bp) sequences containing recombination hotspots. So far, I have found 52 significantly overrepresented sequence motifs of six, seven, and eight base-pairs in length using a motif- finding program, YMF 3.0. Five of these sequence motifs have been confirmed to be hotspots by reconstruction in the genome. Additional hotspot sequence motifs will likely be found as I continue my analysis.

P-65 Molecular genetics.

**A Screen To Isolate Bacterial Mutations In A Plasmid Partition System.**

Dan Decesaris, Eva Chmura, and Kathy Martin, Central Connecticut State University.

Stable maintenance of single-copy plasmids, such as P1 and F, requires gene products produced by the plasmid, a cis-interacting site on the plasmid, and gene products of the bacterial cell. The plasmid encoded components have been well identified and we now seek to study the bacterial encoded components. To this end we have set up a screen that allows us to identify cells that can no longer stably maintain the F plasmid. 60 independent mutant strains of *E.coli* have been isolated. We are currently examining each of these mutants for their ability to maintain the P1 plasmid and for the kinetics of plasmid loss in each of these mutants.

P-66 Theoretical psychology.

**'Is that true?' College Students' Prior Training in Media Literacy and Internet Credibility.**

Russell Michaud and Cyndy Scheibe, Ithaca College.

The concept of media literacy extends traditional literacy to include all of the

forms of media through which we get messages, including TV, magazines, newspapers, films, and the Internet. During the last decade there has been increased emphasis on teaching middle school, high school and college students how to effectively judge the credibility of Internet sites, to decipher messages found in advertisements and other popular media, and to learn to communicate using new forms of digital media. Despite this growing emphasis among educators, little is known about the extent to which incoming college students have been trained in these types of media literacy skills, or if they systematically learn these skills in college. This study reports the results of an online survey of 656 undergraduates at 4 colleges and universities in the U.S. over the past 18 months. Participants were asked to recount their experience, if any, with formal training they received (in middle school, high school, or college) in media literacy, media production, and judging internet credibility. Findings showed that less than half of the students reported receiving any formal training in judging internet credibility, and of those, most based their judgments solely on the URL (e.g., .com vs. .org). While more than 90% of the students said they had learned Power Point, far fewer had learned other digital communication formats like digital video. And while 48.7% said they had learned some other media literacy skills in high school or college, it mostly related to advertising analysis rather than core educational curricula. Results are discussed in light of changing technologies and learning, and implications for college education.

P-67 Cell biology.

**Investigations of the Extended Lipid Hypothesis 2.** Geri Tobbe and J. J. Breen  
Department of Chemistry and Biochemistry Providence College Providence.

The aim of our project is to experimentally test the hypothesis that phospholipids can and do adopt an extended conformation during the important dynamic processes of binding peripheral proteins to membranes. In the extended conformation the non-polar tails of a lipid extend in opposite directions and have the potential to interact with the hydrophobic domains of peripheral proteins. Our experimental approach is to compare the extent and conditions under which cytochrome c, a prototypical peripheral protein, associates and dissociates from acidic lipids in vesicles and solid supported bilayers. In this poster results from our fluorescence energy transfer experiments with labeled lipid vesicles will be presented. One focus of the poster will be experiments with phosphatidylethanolamine (PE) lipids acylated with C2 and C16 length alkyl groups. A second focus of the poster will be experiments where cholesterol is used to alter the fluidity of phosphatidylglycerol (PG) lipid bilayers and affect the ease at which the lipids can adopt the extended conformation.

P-68 Cell biology.

**Investigations of the Extended Lipid Hypothesis 1.** Christopher J. Beaver and J. J. Breen  
Department of Chemistry and Biochemistry Providence College.

The aim of our project is to experimentally test the hypothesis that phospholipids can and do adopt an extended conformation during the important dynamic processes of binding peripheral proteins to membranes. In the extended

conformation the non-polar tails of a lipid extend in opposite directions and have the potential to interact with the hydrophobic domains of peripheral proteins. Our experimental approach is to compare the extent and conditions under which cytochrome c, a prototypical peripheral protein, associates and dissociates from acidic lipids in vesicles and solid supported bilayers. In this poster results from our fluorescence energy transfer experiments with labeled phosphatidylglycerol (PG) lipid vesicles will be presented. A particular focus will be experiments where atropine is used to induce interdigitation among the lipid acyl chains to affect the ease at which the lipids can adopt the extended conformation. In addition, our progress towards the preparation of brominated PG lipids and the [Zn<sup>2+</sup>-heme] variant of cytochrome c will be presented.

P-69 Cell biology.

**Reverse Transcription PCR Of A Molluscan.** Aquaporin Shishkina, Y., Nachtigal, L., Hoopengardner, B., and Kapper, M.A.

During adaptation to altered salinities, intertidal invertebrates typically modulate the concentration of intracellular solutes to match the concentration of the ambient seawater. The solutes most often used are free amino acids. For example, the ribbed mussel, *Geukensia demissa* will accumulate large concentrations of alanine while adapting to high salinity. Coincident with the adjustment of intracellular osmolality is a transient osmotic flux as water first leaves the cells down the osmotic gradient, and then returns during a volume regulatory stage. Since cell membranes are generally impermeant to water, we hypothesize that modulation of aquaporin (specific water channel proteins) content or function is involved in lessening or delaying large-scale changes in cellular osmolality due to water fluxes. Since preliminary experiments using Western blotting to follow the concentration of aquaporin-2 during the course of adaptation from 15‰ to 35‰ were inconclusive, we are currently developing protocols to amplify the AQP-2 message by reverse-transcription polymerase chain reaction. Following extraction of total mRNA from approximately 100 mg of gill tissue, a cDNA was generated by standard reverse transcription procedures. Degenerate PCR primers were designed using published sequence information from mammalian aquaporin-2. Supported by CSU-AAUP research and faculty-student grants to MAK.

P-71 Theoretical psychology.

**Put-Downs and Derogatory Language in Children's Shows, Teen Shows and Situation Comedies (1998-2006).** Randy Hoyt, Chaya Gandolfi, Brendan Woodard, and Yana Topalova, Ithaca College.

Previous research studies have found a high level of violence on children's television, which has been linked to increased levels of aggression and fear in children and teens. However, very little research has been done on the incidence of verbal violence (put-downs, teasing and derogatory language) on children's TV shows. The research reported here involves a descriptive study using content analysis of children's shows, teen shows and situation comedies recorded for the Center for Research on the Effects of Television (CRETV) archive at Ithaca

College. A sample of 240 TV programs were analyzed by pairs of trained coders, with 80 programs for each of three years (1998, 2002, 2006), including 40 children's shows, 30 sitcoms and 10 teen shows. Put-downs were defined as verbal comments about another person or oneself that were disparaging, belittling, humiliating, embarrassing, insulting, mocking, or criticizing. Coders watched each 30-minute program, pausing after each put-down to record the exact statement, information about the characters involved in the put-down, and the consequences following the put-down. In the sample of 240 programs, there was a mean rate of 5.9 put-downs per show, with a range of 0-27 statements. Put-downs occurred most frequently on situation comedies and humorous children's TV shows, and least frequently on prosocial or educational children's TV shows (especially those on PBS). The put-down statements frequently involved general name-calling (jerk, idiot, crazy nut, etc.), or focused on the person's appearance, ability, intelligence, or mental health. On children's programs there were more put-downs related to gender (e.g., criticizing a boy for acting or looking like a girl). Other findings to be reported include variations in the put-down type and consequence by program type, station and year.

P-73 Clinical psychology.

**An examination of Adolescents' Attitudes Toward Drinking and Driving.** Michael Jay Pisco, Manhattan College.

The purpose of the present study was to examine adolescents attitudes toward drinking and driving. Participants consisted of a sample of 131 adolescents enrolled at Carmel High School in Putnam County, New York. The researchers designed an 18 item questionnaire for use in the study. The questionnaire was distributed and completed in Psychology and Health classes at the school. Adolescents responded to questions that assessed attitudes toward drinking and driving as well as how frequently they practiced various drinking and driving related behaviors, such as allowing a friend to drive drunk, drinking alcohol before driving and calling a parent to pick them up if they had too much to drink. The results indicate that 38.9 % of the adolescents have been in the car with a driver who has been drinking and that 11.5% of the adolescents have driven a car after drinking alcohol. In addition, 63.4% of the adolescents believe that drinking and driving is a problem at their school; and 26.7 % do not believe their school properly informs them about the risks of drinking and driving. Furthermore, only 55.7 % of the teens surveyed indicated that they would feel comfortable calling a parent for a ride if they had too much to drink at a party; 10.7 % indicated that they would definitely not feel comfortable and 33.6% indicated that they were uncertain if they could call their parents. These results demonstrate the need for intervention programs aimed at reducing drinking and driving among adolescents. The results further demonstrate the need for open communication between parents and teens about drinking and driving.

P-74 Molecular genetics.

**Expression of green fluorescent protein in *Schizophyllum commune*.** Kirk Bartholomew, Sacred Heart University.

Expression of green fluorescent protein in *Schizophyllum commune* Christine Desanno, Lauren Dzialo, Christos Dimos, and Kirk Bartholomew, Sacred Heart University *Schizophyllum commune*, the Split Gill Fungus, has been extensively studied as a model organism for investigating sexual development in the basidiomycete fungi. In recent years the powerful molecular technique of fluorescent fusion protein technology has been widely used to determine expression and location of proteins of interest in living cells. This technique, which would be very useful to the study of developmental control of gene expression, has been difficult to adapt to *S. commune*. One potential reason for the failure of fluorescent proteins to express could be poor codon compatibility. In order to overcome this potential barrier to expression we analyzed the codon usage of a modified form of the Green Fluorescent Protein (GFP) gene as compared to a set of genes known to be functional in *Schizophyllum commune* and developed a strategy to correct incompatible codons in GFP by site-directed mutagenesis. To date, six successful mutations have been introduced into the coding region of GFP. Transformation of mutagenized GFP into *S. commune* has yielded highly variable and inconsistent expression patterns of GFP. Current results and future directions will be reported.

P-75 Theoretical psychology.

**An examination of verbal memory, conservation, and visual-spatial abilities in Preschoolers.** Sara M. Lowe, Manhattan College.

The purpose of this study was to examine the cognitive abilities of preschool children; specifically, to explore whether preschool children could correctly solve a conservation task using mounds of Playdoh. Performance on a verbal memory task and a visual-spatial puzzle task was also examined. Based on Mendez-Baldwin & Walsh's (2005) study it was expected that the preschoolers would be able to solve the conservation task but that they would demonstrate superior performance on the verbal memory task. Participants consisted of fifteen preschool children, ages 4-5 years, who attend a preschool in New Jersey. The verbal memory task was similar in style to the verbal memory task used in the McCarthy Scales of Children's Development (McCarthy, 1972). Mounds of playdoh were used to assess conservation ability and a puzzle was used to assess visual-spatial ability. Results support Piaget's theory of cognitive development. The preschool aged children were unable to solve the conservation task correctly. This finding does not support the findings of Mendez-Baldwin & Walsh's (2005) prior study. The children in the current study were only able to recall an average of 3 components of the short story. Performance on the puzzle task was better than performance on the verbal memory task and the conservation task. In addition, the results indicate better performance by the girls on the puzzle task.

P-76 Cell biology.

**The Role of Cofilin In Migration of F9 Parietal Endoderm Cells.** Thomas Pagliaruli and James Mulrooney Dept of Biomolecular Sciences, Central Connecticut State University.

A hallmark of cell migration is the reorganization of the actin-based

cytoskeleton. The Rho-Rho Kinase (ROCK) pathway has been implicated in the process of actin remodeling because of its many downstream targets being effectors of cell migration. The Rho/ROCK pathway negatively regulates the actin-severing protein cofilin via serine phosphorylation. We have previously shown an increase of parietal endoderm outgrowth upon ROCK inhibition by use of Y-26732, a highly specific and potent chemical inhibitor of ROCK. In addition, ROCK inhibited cells subjected to western analysis exhibited increased levels of dephosphorylated cofilin. To further investigate the role of cofilin in actin-mediated migration, we used indirect immunofluorescence to verify localization of cofilin in parietal endoderm. Our data suggest uniform distribution of cofilin throughout the cytoplasm. We have also observed areas of increased intensity which may be indicative of areas of increased localization. To this aim, we plan to investigate the sub-cellular localization of phosphorylated and dephosphorylated cofilin in both wild type and ROCK-inhibited Parietal Endoderm outgrowth.

P-77 Molecular genetics.

**A gene with homology to the Cytochrome P450 Pfam domain is down-regulated during sexual development.** Kirk Bartholomew, Sacred Heart University.

A gene with homology to the Cytochrome P450 Pfam domain is down-regulated during sexual development in *Schizophyllum commune* Kayleigh Erazmus, Persida Kastrati, Lucas Bernacki, Charles McEntee, and Kirk Bartholomew, Sacred Heart University. The well-characterized A and B mating-type loci of *Schizophyllum commune* control activation of sexual development when haploid mycelia of non-self mating type interact. Considerable prior evidence suggests that the protein products of both the A and B loci initiate the events of sexual development by controlling the expression of target genes in compatible mates eventually leading to the formation of dikaryotic mycelia capable of progressing through sexual reproduction. However, genes targeted for alteration in expression via direct interaction with the protein products of the mating-type loci have been difficult to identify. A previous study using the reverse transcriptase differential display polymerase chain reaction method to isolate genes expressed differentially during the early stages of sexual development resulted in the cloning and sequencing of ddPCR04\_05 10b, a partial cDNA with significant homology to the cytochrome p450 family of proteins (pfam00067). Homology searches to the genome sequences of related basidiomycetes have identified closely related full length homologous genes. Progress in producing a fine scale analysis of ddPCR04\_05 10b expression by real-time PCR and multiple sequence alignment analysis of related genes will be presented.

P-78 Organic chemistry.

**Cochineal Dye** Felisha Santory and Br. Andrew Winka, Manhattan College.  
Felisha Santory and Br. Andrew Winka Joined Department of Chemistry and Biochemistry.

Cochineal Dye Cochineal is a natural dye that was founded by the early Mixtec Indians and then adopted by farmers from southern Mexico. The dye

comes from the inside of a scale insect. In its body fluids and tissues it stores a deep maroon pigment. The female colonizes a pad from a cactus where it spends its life sucking on it. It obtains its nourishment by sticking a tube in the pad of the cactus. The pigment that is formed is called carminic acid, which we know as cochineal. The color intensity was tested visually, where we used natural cochineal versus synthetic cochineal. It appeared that the synthetic cochineal dye was absorbed more by the wool and polyester than the natural cochineal dye. The observation concluded that natural dyes are less permanent which was seen during the final process of washing the wool as the dye had washed out easily. The intensity was also tested by using different mordents. Mordents are used to help the dye molecules attach to the fiber molecules. They are mostly metal ions. They help the dye stay attached to the fiber during the final process of being washed. Each mordant used resulted in a different color, when added to the water bath of cochineal with either the wool or polyester. The mordents used were: alum, copper, tin, chromium, and iron. Wool, which is a natural fiber versus polyester, which is a synthetic fiber was tested with both natural and synthetic cochineal. After doing several experiments it became clear that with both natural and synthetic cochineal, wool was more absorbent than polyester. The reason for this is that wool reacts with both acids and bases. It does not need to be combined with

P-79 Theoretical psychology.

**What Kind of Pyramid is THAT? Nutritional Content of Foods Advertised to Four Target Audiences on TV.** Lauren Marko and Wendy Horning, Ithaca College.

Previous studies of food advertisements shown during children's television have found that these commercials contain products high in sugar, fat, and sodium (Harrison, 2005). However, it is not clear whether this trend occurs more during children's shows than in shows aimed at other target audiences, and if it has gotten worse over time or not. In order to address these questions, this study analyzed a sample of 830 food and beverage products advertised during 1983, 1992, and 2004. During each year, food and beverage commercials were selected from four different months (March, June, September, and December) for four identified target audiences: children (during children's programs); women (during soap operas); men (during sports); and general audience (during prime time). The sample of products was identified, and information was then recorded from the actual product package (either in grocery stores or from historical information gathered online). In consultation with a nutritionist, products were then classified into proper locations in each of the food groups of the original Food Pyramid, and a comparison was made between the recommended diet and those products advertised to each audience on TV. Findings show that for the four target audiences, foods fell mostly into two food groups: grains, and fats and sugars. Commercials shown during children's programs and sports (targeting men) showed the most distorted food pyramids, with almost no foods from the fruit, vegetable, dairy or protein groups. There were also many products advertised that do not fit into the food pyramid at all, such as alcohol, diet soda, and water. From this historical analysis, it is evident that all audiences are

receiving distorted nutritional messages on television.

P-80 Experimental psychology.

**Infant Visual Attention During a Mobile Task.** Richard Gubala, Kathleen A. Fox, Dr. Donna Fisher-Thompson, Niagara University.

Developmental psychologists use mobile tasks to assess infant learning and memory. During the baseline phase, the infant's leg is not attached to the mobile, but the mobile is visible to the infant. In acquisition, a ribbon connects one of the infant's legs to the mobile; thus, each kick of the fastened leg causes movement of the mobile. The infant should increase kicking rates as they learn the association between kicking and movement of the mobile. During the extinction phase, the ribbon is once again disconnected from the mobile. Kicking during extinction is used as a measure of immediate retention. The purpose of our study is to compare visual attention during the mobile task under three different conditions. Attention to the mobile will be examined in a familiar environment (the infant's home) and in the laboratory. Attention will also be compared in a laboratory setting where an experimenter moves the mobile during the acquisition phase. We predict that infants will look at the mobile more under the conditions in which their kicking causes movement of the mobile. Additionally, it is predicted that infants tested in the familiar environment of their own home will pay more attention to the mobile because it is the only unfamiliar object in their surroundings.

P-81 Molecular genetics.

**A Bioinformatics Tool for Analyzing G-quadruplexes in the mRNA Untranslated Regions.** Zachary Zappala: Bergen County Academy and Ramapo College of NJ Lawrence D Antonio: Ramapo College of NJ Paramjeet Bagga: Ramapo College of NJ.

Untranslated regions of eukaryotic mRNAs contain motifs that are vital for regulation of gene expression at posttranscriptional level. Specific interactions between RNA binding proteins and cis-acting elements in 5' and 3'-UTRs are responsible for regulating essential biological activities, such as mRNA localization, mRNA turnover, and translation efficiency. Much attention has been paid to study the composition of regulatory RNA motifs and mechanism of their interactions with the cellular machinery. Guanine rich nucleic acids have been shown to form a G-quadruplex structure which is implicated in a variety of regulatory processes in the cytoplasm, including mRNA turnover via exonuclease action, interaction with FMRP, cap independent translation initiation, and translation repression. We have developed a software program for analyzing G-quadruplexes in the untranslated regions of mRNAs. The UTR specific module is an extension of the existing Quadruplex forming G-Rich Sequences (QGRS) Mapper program in our suite of computational tools that search mammalian genes for occurrences of the G-quadruplex motif, and analyze their distribution patterns near biologically important sites on the precursor and mature mRNAs. The QGRS-UTR Mapper is being used to study a very large number of eukaryotic mRNAs for identifying cis-regulatory G-quadruplex motifs in their 5' and 3'-UTRs. The goal of these experiments is to explore the role of G-quadruplex

structure in regulation of gene expression at posttranscriptional level.

P-82 Systemic biology.

**Blue Light Affects Melatonin and Circadian Rhythms of Rats.** Benjamin Michael Savasky Department of Biology, John Carroll University.

Blue Light Affects Melatonin and Circadian Rhythms of Rats Benjamin Michael Savasky, John Carroll University The purpose of the experiment was to observe the effects that blue light had on melatonin levels and subsequent physiological and behavioral changes in rats. Control and experimental animals were located in adjacent rooms. Animals were placed in separate cages with activity wheels and implanted with a transmitter that measured activity and body temperature. Fifteen days were devoted to a habituation period in which there was a 12-hour light/12-hour dark cycle. After habituation, a blue light period of 19 days ensued during which time experimental animals were exposed continuously to blue light. Control animals remained on the habituation cycle throughout the experiment. Half of the control and experimental animals were sacrificed in the original light period and the other half in the original dark period. Control animals had significantly higher levels of melatonin in the dark than in the light. Experimental animals had very low levels of melatonin in both dark and light. During habituation, control and experimental animals exhibited synchronicity of activity in the dark. After the addition of continuous blue light, the activity shifted and there was an immediate decrease in intensity. In addition, body temperature became erratic. Statistical analysis indicated no significant differences in body weight between control and experimental rats although experimental animals gained more weight. Statistics indicated a significant change in food intake and metabolism between control and experimental animals in the blue light with experimental animals eating less total food and exhibiting a lower metabolism. In conclusion, blue light had a significant effect on melatonin levels, food intake, metabolism, synchronicity of circadian rhythms and behavior.

P-83 Behavior biology.

**Effect of Various Ethanol Concentrations on the Shoaling Behavior of Zebrafish (*Danio rerio*).** Anastasia Kurta, Wagner College.

It has been predicted that fish should prefer to shoal (school) with similar individuals, as an adaptation to avoid predation via the confusion effect. Zebrafish (*Danio rerio*) shoaling was studied via observations of groups of four fish, divided by gender and subjected to four different ethanol (EtOH) concentrations. In the past ethanol has been shown to have hormetic effects at low level doses, affecting behavior of many organisms. All of the observations were recorded every 2 min using a camera connected to a computer, and with each trial lasting a total of 12 min. Nearest neighbor distance between each fish, as well as the shoaling area, were quantified and compared between each concentration. Analysis of 1.0% EtOH concentration has indicated to have inhibitory effects on behavior in comparison to the control. Preliminary results also suggest that shoaling is tighter than in the control at lower

concentrations.

P-84 Cell biology.

**A New Database of Protein-Ligand Binding Sites.** Matthew Croken and Dr. Ash Stuart, Ramapo College of New Jersey.

We have developed a new, public database of proteins and small chemical compounds with which they are known to interact. Starting with information from the Protein DataBank, we wrote Perl scripts to identify PDB files that showed proteins in complex with their ligands and create a table displaying which amino acid residues were close enough (within 5 Å...) to the ligand to be included in the active site. This table was fed into a MySQL database. We created a PHP website that enables the user to search the database remotely and identify which proteins are known to interact with a specific ligand or which compounds have interacted with a particular protein. In either case, the database will also provide information on what specific residues form the binding site. It is our hope that this new tool will further general understanding of protein-ligand interactions. In particular, this database is designed with drug discovery for underserved diseases like malaria in mind. The central objective of this project is to provide a freely available tool for researchers to identify chemical compounds that may be used in novel, affordable drug treatments and cures.

P-85 Microbiology.

**Assessing Microbial Contamination on Computer Lab Keyboards at CCSU.** Sheila Chery and Michael Davis, Department of Biomolecular Sciences, Central Connecticut State University.

Computer keyboards are a common source of microbial contamination, particularly common-use computers in student computer laboratories. An assessment of several keyboards at Central Connecticut State University was performed. A simple swabbing technique was developed and used to collect samples from specific locations on keyboards in a highly utilized computer lab. Samples were plated on media chosen to reveal total microbial count (nutrient agar) and to identify specific categories of potentially problematic microorganisms. These specialized media included mannitol salt agar, sheep s- blood agar, eosin-methylene blue agar, and Sabouraud agar. Results can thus reveal the total degree of contamination, along with indications of staphylococcal, fecal, and yeast contamination. The results confirm our expectations for the presence of microorganisms, though the types of contaminants vary considerably.

P-86 Population biology.

**Genetic analysis of Nutella populations on the Maine seacoast.** Alison Romegialli, Charles Toth, and Pat Ewanchuk, Providence College.

Little is known about the genetic variation that dictates selection of Nutella, a common sea snail found in the rocky intertidal of the American Atlantic shore. This study hopes to show genetic selection through allozyme variation among different populations of Nutella along the Maine coast. With a sample size of 500, PCR will be performed on the genomic DNA from the snails with rRNA 12S primers to show the commonality among this genus of snails. Restriction fragment

length polymorphisms will be performed on the PCR products for every sample tested. Protein lysates will be analyzed using native acrylamide gel electrophoresis. Gels are stained in situ for glucose and mannose phosphate isomerases (GPI and MPI) and variation is determined by isomer migration. Because this project is in its early stages, the results are still statistically inconclusive. Work is in progress to optimize the protocols in order to analyze the sample population.

P-87 Computer sciences.

**Comparative modeling of malaria protein pbs36.** Sophie Okolo Ramapo College of New Jersey

2nd Author: Dr. Ashley C. Stuart Ramapo College of New Jersey.

a Department of Bioinformatics, School of Theoretical and Applied Sciences, Ramapo College of New Jersey.

The structure of malaria protein pbs36 has not yet been successfully modeled because the related protein sequences (templates) have not been determined. pbs 36 has between 8 -10 membrane spanning domains and it is a member of the plasmodium 6-cys domain protein family.

MODELLER was used in the structural modeling of pbs36 with generated PDB templates. In MODELLER, 3D models are obtained by optimally satisfying spatial restraints derived from the 3D-Jury sequence alignment and using the coordinates from a known structure. The molecular graphics program, Chimera is used to identify, study and predict the transmembrane domains, potential substrate binding sites and other properties based on the homology models from MODELLER

P-88 Cell biology.

**Netrin-1-Mediated Activation of the Aryl Hydrocarbon Receptor.** John Sinnamon, Jamie Gainor, Jessica Kowal, Laura Donovan, and Joseph Bartoe Department of Biology, Providence College.

Netrin-1 is involved in short- and long-range neuronal guidance during nervous system formation and is integral to the survival of developing neurons. Neurons and axons are directed to their targets with netrin-1 acting either as an attractant or a repellent depending on receptor expression levels. The two vertebrate families of netrin-1 receptors, Deleted in Colorectal Cancer (DCC) and UNC5, mediate axonal guidance through interactions with netrin-1 and each other. The DCC family mediates attraction to netrin-1 while the UNC5 family forms a netrin-1-dependent complex with DCC to mediate repulsion. Recently, the aryl hydrocarbon receptor (AHR) has been genetically linked to netrin-1-mediated axon guidance pathways in *C. Elegans*. This is significant as AHR mediates the toxicological effects of aryl hydrocarbons (AHs) in vertebrates. In the developing human nervous system, exposure to AHs is associated with neurobehavioral and motor neuron deficits. In vertebrates, AHR is expressed in many different regions of the brain; therefore, it is plausible that AH toxicity alters netrin-1 signaling. Deficits linked to prenatal and perinatal AH exposure may result from these alterations and cause disruptions in axon guidance and neuronal survival. We hypothesize that AHR is involved in the downstream signaling pathways for netrin-1, with abnormal activation of AHR leading to defects in netrin-1-mediated axon guidance. Using immunofluorescence, we find

AHR and DCC are expressed in rat hippocampal neurons and colocalize within the same neurons. Since AHR is known to be a transcription factor, we sought to determine if AHR localizes to the nucleus following netrin-1 stimulation. We find that upon netrin-1 stimulation, there is a higher level of AHR expression in the nucleus, occurring within forty- five minutes of exposure. Together, these data indicate AHR is involved in netrin-1-stimulated signaling pathways and that AHR mediates netrin-1- stimulated transcription. (Funded

P-89 Organic chemistry.

**NMR Relaxation Studies of Simple Amide Compounds.** Tiffany Muns, Kaely Aikman, Nancy E. Breen Department of Chemistry, Roger Williams University.

Results of NMR relaxation studies of simple amide compounds will be presented. The  $^{13}\text{C}$  spin lattice NMR relaxation times of N-methyl acetamide, N, N dimethyl acetamide and  $\epsilon$ -caprolactam were measured in various solvents on a JEOL ECX 300 MHz NMR spectrometer. The relaxation times were found to vary with solvent, particularly if the solvent can participate in hydrogen bonding. For example, the carbon atom in the amide bond of  $\epsilon$ -caprolactam had a T1 relaxation time that varied from 10. seconds in  $\text{CDCl}_3$  to 38 seconds in  $d_3\text{-CD}_3\text{CN}$ . The shorter T1 relaxation time observed in  $\text{CDCl}_3$  can be explained by the nature of the H-bonding present in the sample. In  $\epsilon$ -caprolactam, the amide bond adopts the cis-configuration because of ring strain. When it forms hydrogen bonds with itself, as it does in  $\text{CDCl}_3$ , it forms cyclic dimers. In this geometry, the  $\text{C}=\text{O}\cdots\text{H}-\text{N}$  is more rigid and therefore undergoes less molecular motion than when it is not hydrogen bonded to itself. This makes for a longer local correlation time and a shorter T1 relaxation time. The data for all our amides studied to date will be presented and discussed in terms of these simple models of hydrogen bond formation and associated range of molecular motions as each solvent is varied.

P-90 Cell biology.

**Western blot analysis of nNOS expression in the guinea pig cardiac ganglion.**

Amber Contrastan and Jean Hardwick. Biology Department, Ithaca College. Autonomic function can be modulated by local reflexes and locally-derived chemical mediators. One example of this interaction is seen in the regulation of the parasympathetic cardiac ganglion, which helps to control cardiac function. The intracardiac neurons located within this ganglion receive both direct autonomic inputs from the brain and diffusible signals from nearby cells, such as mast cells and other neurons. One such signal is nitric oxide (NO). Nitric oxide is produced by the enzyme nitric oxide synthase (nNOS), which is found in a subpopulation of intracardiac neurons. Previous studies have shown that NO production is increased in diseased hearts, suggesting that there is an upregulation of NOS in this tissue. This study examined whether inflammatory signals, such as those produced by mast cells, can alter the expression of nNOS in the cardiac ganglion using Western blot analysis. The levels of nNOS expression in tissue from guinea pig cerebellum, liver, small intestine and cardiac ganglion were analyzed. A 150 kD band was observed in brain, intestine

and cardiac ganglion tissues known to express nNOS and was not observed in the liver. These studies confirm that Western blotting can be used to quantify nNOS expression levels in the guinea pig cardiac ganglion, and thus can be used to monitor changes in expression with inflammatory signals.

P-91 Cell biology.

**Macromolecular crowding agents influence on restriction endonuclease activity in Vitro.** Misko, Dan. Shara Ellinger. Robert S. Greene. The Academic Center for Integrated Sciences, Niagara University.

Macromolecular crowding refers to the amount of macromolecules occupying free or unused space within a given cell. The purpose of studying these agents is to better understand the role macromolecular crowding plays in cellular processes. Such effects caused by macromolecular crowding include structural alterations of proteins, accelerated reaction rates, and interference within diffusion pathways. The model used in this experiment was the supercoiled plasmid DNA pUC19 from E. Coli. This small cloning vector has unique restriction sites at different points in its restriction map. A protein system was utilized in order to determine the effects of macromolecular crowding on the kinetics of restriction nucleases in digestion of pUC19. The four enzymes of the protein system digest pUC19 uniquely and are AlwNI, SapI, NdeI, and ScaI. These enzymes cut at 1217, 683, 183, and 2177 bp respectively within the supercoiled pUC19 restriction map. The results of the experiment will better describe the effects macromolecular crowding on supercoiled DNA restricted sites in functional DNA.

P-92 Clinical psychology.

**Relationship between Perfectionism and Sleep Difficulties.** Laura J. Kohberger, Wagner College Steve M. Jenkins, Wagner College.

Previous research suggests that sleep difficulties are more common among college students than in the general population, with approximately one-third of college students reporting common or chronic sleep difficulties. Many college students demonstrate perfectionistic tendencies including rumination, unrealistic self-expectations, excessive fear of criticism by others, and high levels of arousal. It is possible that these tendencies may exacerbate or be the underlying cause of sleep difficulties in some individuals. The current study examines the relationship between perfectionism and sleep difficulties.

P-93 Molecular genetics.

**Characterization Of The Anti-Apoptotic Gene, Bax Inhibitor-1 (BXI1), In The Yeast, Saccharomyces.** J.K. Malouin\*, E. Feeley\*, and N. Austriaco, O.P. Dept. of Biology, Providence College J.K. Malouin\*, E. Feeley\*, and N. Austriaco, O.P. Dept. of Biology, Providence College.

Bax Inhibitor-1 (BI-1) was first identified by its ability to block Bax-induced apoptotic cell death in the budding yeast, *Saccharomyces cerevisiae*. Intriguingly, BI-1 is one of a few cell death inhibitors found in a wide range of fungi, plant, and animal species including *Saccharomyces cerevisiae*, *Drosophila melanogaster*, *Arabidopsis thaliana*, *Mus musculus*, and *Homo sapiens*.

This suggests that it is an ancient protein. Recent studies have suggested that BI-1 is involved in the cell's response to endoplasmic reticulum stress. We are currently characterizing the yeast homolog of BI-1, which we are calling BXI1. First, we have generated mutant yeast strains lacking BXI1. We are currently characterizing the mutant strains by exposing them to a wide range of apoptosis-inducing and ER-stress-inducing conditions. Next, in collaboration with the Yeast Resource Center at the University of Washington, Seattle, we have initiated a yeast two-hybrid screen to identify Bxi1p-interacting proteins. With knowledge of the function of BXI1 in yeast we hope to better understand the function of Bax Inhibitor-1 and its role in a wide range of human cancers.

P-94 Molecular genetics.

**Genetic Characterization Of The Aging Gene, UTH1, In The Yeast, Saccharomyces J.** J. Ritch\*, J. Sheehan\*, and N. Austriaco, O.P. Dept. of Biology, Providence College.

The aging gene, UTH1, was originally identified as a mutant that increased the lifespan and stress resistance of yeast cells carrying a truncation of Mpt5p. It is a founding member of the SUN family of genes found throughout the fungal kingdom. The deletion of UTH1 results in increased replicative and chronological lifespan as well as in resistance both to hydrogen peroxide and to rapamycin. Intriguingly, deleting UTH1 blocks Bax-induced apoptotic cell death in yeast. Uth1p has been localized to the outer mitochondrial membrane and the cell wall and others have suggested that it is involved in regulating the process of mitochondrial autophagy. However, our genetic data suggests that the rapamycin resistance associated with the deletion of UTH1 is independent both of autophagy a  $\Delta$ uth1 $\Delta$ atg1 is still rapamycin resistant. We are continuing to create and characterize double and triple uth1 mutants to illuminate the function of UTH1.

P-95 Molecular genetics.

**Genetic Characterization Of The Mechanism Of Action Of Sulforaphane (SFN) In The Yeast, Saccharomyces B.** Roussel\*, D. Fay\*, T. Hittinger\*, and N. Austriaco, O.P. Dept. of Biology, Providence College.

Sulforaphane (SFN) is a member of a class of antioxidants known as isothiocyanates that are found in broccoli and other cruciferous vegetables. Reports from several laboratories have shown that SFN has anticancer and antimicrobial activity. However, the mechanism by which SFN acts in living cells remains illusive at this time. Recent studies that investigated the mechanisms of SFN's chemotherapeutic effect have suggested that SFN works by causing cell cycle arrest and/or apoptosis but the mechanism of cell death is not fully understood. To elucidate the mechanism of action of SFN, we have initiated studies of its effects on the budding yeast, *Saccharomyces cerevisiae*. We have determined that at a concentration of 160  $\mu$ g/ml, SFN significantly retards the growth of wild type *S. cerevisiae*. Moreover, we have discovered that sulforaphane kills  $\Delta$ atg1 mutants at a concentration of 80  $\mu$ g/ml, supporting a role for autophagy in the mechanism of SFN action in yeast cells. We are now conducting a genetic screen in order to isolate mutants that survive during treatment with

SFN in the absence of the ATG1 gene. This will facilitate our efforts to identify a genetic pathway through which SFN influences autophagy and apoptosis in yeast cells, a pathway that could be conserved in human beings.

P-96 Environmental biology.

**Effect of mulch type upon tomato yield at an organic farm.** Richard S. Feldman, Amanda Rollizo, Erin Spada Department of env sci & policy, Marist College. Most tomatoes are produced with black plastic mulch (polyethylene sheeting or film) to suppress weeds, maintain soil moisture and warm soil temperature. Alternatives to such plastic are desirable since it is made from petroleum and becomes solid waste after the growing season. Three additional mulches plus no mulch were used to test the effect of mulch type upon tomato production. The five treatments were applied at Brook Farm, New Paltz, NY, a diversified organic vegetable farm, during the 2006 growing season. The four mulches were black polyethylene, woven polypropylene groundcover, straw, and 4 of compost. These mulches plus the bare treatment were randomly assigned among two 100 rows. Each treatment was planted with both Markovitch (slicing tomatoes) and Red Agate (paste tomatoes), as a split plot. Data was collected twice weekly until first frost. Healthy tomatoes were collected and weighed. The results were analyzed in order to determine which mulch type was the most effective for producing maximum biomass output. Markovitch and Red Agate tomatoes had highest yield with compost and straw mulches. Surprisingly, Red Agate yield was lowest with polyethylene, while Markovitch yield with polyethylene was intermediate among the five treatments. The results support the advantages using locally-available compost and straw for tomato production. These two mulches will also improve soil organic and nutrient content.

P-97 Cell biology.

**The effects of chloroform, bromoform and tetrachloroethylene on PKA in developing zebrafish brain.** Peter Tuminelli, Joseph Trabuisky, Megan Williamson, Christopher Lafferty (Saint Joseph by the Sea HS) advisors: Christopher Corbo, Charles Jenkins (Wagner College) \*Sara Rose Guariglia (CUNY Graduate Center). Using zebrafish as a model, the aim of this study was to assess the effects of chloroform, bromoform and tetrachloroethylene (PCE) on PKA in the developing brain. Chloroform, bromoform and PCE were detected in elevated concentrations in the Brick, New Jersey municipal water supply, an area that is known to have an elevated prevalence of Autism Spectrum Disorders (ASD). In a previous study, it has been demonstrated that this toxin triad acts synergistically to cause elevations in the levels of catalytically active PKA in the developing neurons of the surf clam embryo. PKA is a ubiquitous enzyme that is thought to play a critical role in many second messenger pathways, such as those which lead to synaptogenesis and chemotactic responses to guidance cues in developing brain. Any abnormalities in PKA activity may cause these events to go awry, and may result in abnormalities that are consistent with those found in autistic brain. Our data evidences that chloroform, bromoform and PCE do result in increases of catalytically active PKA, thus providing evidence that exposure to these

chemicals does effect brain development.

P-98 Experimental psychology.

**The Effect of Caloric Density on Conditioned Taste Preferences of Caffeinated Beverages.** Alfred Raccuia & Laurence J. Nolan Department of Psychology, Wagner College. Learning through Pavlovian conditioning significantly contributes to an individual's liking for food and drink. This type of learning is known as conditioned taste preference, and it is known that in humans conditioned preference is influenced by the caloric density of the food or drink in question. Furthermore, caffeine is a weak positive reinforcer, with mild psychoactive effects. Through its ability to act as a negative reinforcer, people can be conditioned to prefer the taste of caffeine. The question of whether greater caloric density of the drink produces stronger conditioned taste preference in caffeinated beverages has not been addressed. The aim of the present study was to determine whether caloric density has an effect on the production and degree of conditioned caffeine taste preference. The study included four groups: caffeine and sugar, caffeine and Splenda, no caffeine and sugar, and no caffeine and Splenda. Pleasantness ratings of the groups were compared.

P-99 Ecology.

**Macrofauna and Morphospecies Associated with Effects of Post-Logging.** Michael Clark, Kelly Horan, and Jack Tessier: Central Connecticut State University. Central Connecticut State University Logging of central Connecticut's wooded areas has become a common practice over recent years. The purpose of this study was to determine the effects of the logging on soil and macrofauna that are inhabiting these areas. During testing, controls were placed on land elevation to reduce variation in plant species. Data shows that similar soil macrofauna were found to be present in areas that were heavily logged. In studies of areas that were not logged, the macrofauna species found to be present differentiated, but with little degree. When studying the effects of logging on morphospecies abundance, the data did not show that logging had an effect on the abundance or differentiation of bacterial colonies found to be inhabiting the soil. In analyzing the degree of logging in the ten different testing sites, the area that had shown the greatest amount of logging also had the greatest abundance of bacterial growth within the soil. When looking at the data concurrently it is evident that areas that were subject to large degrees of logging had the greatest abundance of macrofauna and morphospecies colonies present in soil samples.

P-100 Behavior biology.

**Anti-Theft Behavior Used by Eastern Gray Squirrels.** Gina Rodriguez, Stephanie Collin, Allison Gaudet, Rachel Birk, Holly Bugbee, Rebecca Demers, Jennifer Dupuis, Jessica Larkin, Lauren Mattis, Kelly Nazario, Jasmine Waterman, and Sylvia Halkin, CCSU. Eastern gray squirrels, *Sciurus carolinensis*, perform behavior that seems likely

to function to reduce the chance of their buried acorns or nuts being stolen by thieves (other squirrels, crows, or blue jays). We conducted experiments to determine whether this pilferage-averting behavior became more common after squirrels experienced thefts of their buried nuts. During the first set of trials (pre-pilfering), we recorded a squirrel's behavior as it buried hazelnuts from an array we had set out in a location where squirrels were foraging naturally. In the second set (pilfering trials), a person acted as a pilferer and attempted to dig up each nut after it was buried; we recorded the squirrel's behavior as it continued to bury nuts. During the final set of trials (post-pilfering), we returned to simply observing and recording the squirrel's behavior as it buried nuts. The pilferage-averting behavior patterns most commonly used by squirrels during our experiments were covering empty sites in addition to the places where nuts had been buried, and burying nuts in inaccessible locations (under bushes or behind a fence); some squirrels also moved to locations visually obscured from observers to bury nuts. Squirrels most commonly used pilferage-averting behavior during pilfering trials, and next most commonly during post-pilfering trials, supporting the hypothesis that squirrels respond adaptively with pilferage-averting behavior when their buried nuts are threatened. (Department of Biology, Central Connecticut State University)

P-101 Molecular genetics.

**Phylogenetics of G-quadruplexes mapped near RNA Processing sites of Mammalian Genes.** Aileen Tolentino, Lawrence D'Antonio and Paramjeet Bagga Institution: Bioinformatics, Ramapo College of New Jersey.

The quadruplex structures formed by guanine rich nucleic acid sequences have received significant attention recently because of increasing evidence for their role in important biological processes and as therapeutic targets. G-quadruplex sequence motifs have been reported in telomeric, promoter and other regions of mammalian genomes. G-quadruplex DNA has been suggested to regulate DNA replication and may control cellular proliferation. Although initially most of the studies focused on G-quadruplexes in the DNA, lately there have been many efforts to study G-quadruplex forming RNA. In fact, G-rich sequences capable of forming G-quadruplexes in the RNA have been implicated in a variety of important biological activities, such as mRNA turnover, Fragile X Mental Retardation Protein (FMRP) binding, translation initiation as well as repression. We have used a computational approach to map putative Quadruplex forming G Rich Sequences (QGRS) within the transcribed regions of a large number of alternatively processed human and mouse genes. Our computational suite consists of a 'QGRS Mapper' program that can analyze fully annotated genomic nucleotide sequences from NCBI-based databases, and the 'GRSDB' database for curation and further analysis of QGRS Mapper data on alternatively spliced and alternatively polyadenylated mammalian genes. We have been using these servers to perform a large scale analysis of alternatively processed mammalian transcripts. At present, our database contains information obtained from >30,000 eukaryotic genes. Our data suggest that G-quadruplex elements could play a regulatory role

in differential RNA-processing. The goal of current project is to investigate phylogenetic relationship among homologous G- quadruplex structures in mammalian genes. These studies involve detailed comparisons of homologous genomic sequences and mapped G-quadruplexes near RNA processing sites. Our findings from these experiments will be presented at the conferenc.