



IN VIVO

The Publication of the Metropolitan Association of College and University Biologists

Winter, 2008

Volume 29, Issue 2

The Transformers Advances in Cancer and Stem Cell Research

40th Annual MACUB Conference



Hosted by
St. Johns University
October 20, 2007



A Publication of the Metropolitan

Association of College & University Biologists
Serving the Metropolitan New York Area
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The MACUB web site is now up and running. We now call for members to use the web site for registration information. Register for the 40th Annual Fall Conference on-line. Submit your poster presentation abstract on-line. Submit your member paper presentation on-line. If you are a MACUB member in good standing and have a web site that you would like linked to our web site, submit the URL address to: gsarinsky@kbcc.cuny.edu.

The Fall 2007 Conference Poster Abstracts

Poster Presentation Awards

Community College Division

First Place

Image Analysis of Insulin-Like Growth Factor-II Receptor Expression in HIV Encephalitis

*Ryan Natividad¹, Meng-Liang Zhao², Hannah Suh², Sunhee C. Lee² and Melissa Nashat^{1,2}

¹Borough of Manhattan Community College, New York, NY and ²Albert Einstein College of Medicine, Bronx, NY

Initial Steps in Determining the DNA Barcode for Ribbed Mussel (*Geukensia demissa*) Species Identification

*Lynique Johnson and Sarwar Jahangir

Kingsborough Community College, Brooklyn NY

Second Place

A Study of Heavy Metals in Marine Organisms in Jamaica Bay, NY

*Ashrain W. Corbie, Autumn R. Robbins, Mary T. Ortiz and Kristin Polizzotto
Kingsborough Community College, Brooklyn, NY

Heavy Metal Content in Jamaica Bay, NY Sediment

*Autumn R. Robbins, Kristin Polizzotto, Ashrain W. Corbie and Mary T. Ortiz
Kingsborough Community College, Brooklyn, NY

Senior College Division

First Place

Alternatively Processed Sites in Apoptotic Genes are Associated with Special G-Quadruplex Motifs

*Viktor Vasilev, Oleg Kikin, Lawrence D'Antonio and Paramjeet Bagga
Ramapo College of New Jersey, NJ

Cell Culture Model of Starvation and Refeeding to Study the Regulation of Mitochondrial Glycerophosphate Acyltransferase

*Dwayne Punnette, Prajna Guha, Dirak Helder and Rasheda Shilpi
St. John's University, Queens, NY

Evaluation of *E. faecalis* and *E. faecium* Populations in the Upper Passaic River during Summer 2007

*Dean Chamberlain and June Middleton
Fairleigh Dickinson University, Madison, NJ

Graduate School Division

First Place

Matrix Dependent Expression of a 65 kDa Protein Associated With Enhanced Tumorigenesis

*Catherine Tolvo
New York College of Osteopathic Medicine, Old Westbury, NY

Developing A DNA Barcode For The American Lobster (*Homarus americanus*). *Marlene Alvarez and Z.M.G. Sarwar Jahangir, Kingsborough Community College, Brooklyn, NY, USA.

Identification of a eukaryotic species using morphology is limited. The mitochondrial cytochrome C oxidase subunit I (COI) DNA barcode resolves these limitations. The COI gene is about 600 nucleotides in length coding a 200 amino acid long protein. The degenerative nature of codons and wobble allow the third nucleotide in a codon to vary making the COI DNA sequence species specific. The American Lobster (AL), *Homarus americanus*, is a delicacy and highly priced seafood in American dishes. It is found from Cape Hatteras, NC, to the Strait of Belle Isle between Labrador and Newfoundland, and abundant in the Gulf of Maine, Nova Scotia and Gulf of St. Lawrence. According to the US National Marine Fisheries Service, AL is already overfished. For its efficient management, AL must be identifiable from its tissue remains, eggs and larval samples. In this study we obtained three fresh AL samples from a seafood store, and extracted the mitochondrial DNA following BioVision kit protocol. The DNA will be amplified using PCR and COI primers (GGTCATGTAATCATAAAGATATTGG and AGGCCTAGGAAATGTATMGGGAAA) and sequenced by Laragen Laboratory. The sequences will be aligned to identify a consensus COI DNA barcode for AL.

Morphometrics Of Grass Shrimp Species In New York And Florida. *Islam Aly, *Franchette Vilorio, *Eugene Didonato, Tara Glover and Kathleen Nolan, St. Francis College, Brooklyn, New York, USA.

Over one hundred grass shrimp *Palaemonetes pugio*, *P. vulgaris*, and *P. intermedius* were collected in the spring of 2006 and 2007 from the Salt Marsh Nature Center, Jamaica Bay (Queens, New York), Beczak Environmental Education Center (Yonkers, New York) and Apalachee Bay in Florida. These were identified, weighed, and measured. *P. pugio* was the most abundant, comprising over 70% of the samples collected. Eggs of gravid shrimp were counted using a Motic camera set-up and Image J. Data graphs (frequency distribution, length vs. mass, length vs. egg count, and mass vs. egg count) were created. There is a direct exponential relationship between length and mass of *P. pugio*. *P. pugio* from the north are generally longer and heavier than their southern counterparts. Gravid *P. pugio* from the south average 3.0 cm in length, while gravid *P. pugio* from the north average 4.0 cm in length. Global warming may affect the various habitat of *P. pugio* along the Atlantic and Gulf coast, which in turn, may upset the ecosystems of those areas. Therefore, it is imperative to have a baseline to compare future data against.

Single Alanine Mutants Of Cartilage Oligomeric Matrix Protein Coiled Coil (COMPcc). *Hanna Barra¹, Natalya Voloshchuk¹, Wendy Hom¹, Susheel Kumar Gunasekar¹, Jennifer S. Haghpanah¹, Soumya R. Nanda¹, Mandy Lee¹ and Jin K. Montclare^{1,2}, ¹Polytechnic University, Brooklyn, NY, USA, ²Downstate Medical Center, Brooklyn, NY, USA.

Cartilage Oligomeric Matrix Protein (COMP) is a member of the Thrombospondin family found in cartilage, tendons, and ligaments. It is a protein composed of 5 domains: the N-terminal tail (five stranded coiled-coil (COMPcc) region), the Association Domain, the Type 2 Repeat EGF-like Domain, the Type 3 Repeat Ca²⁺-Binding Domain, and the C-terminal Domain. The N-terminal coiled-coil domain self-assembles to form a hydrophobic pore which allow for the binding of small hydrophobic molecules such as Vitamin D3 and all-*trans* retinol. Ten single-alanine mutants in the hydrophobic region of COMPcc have been created to investigate the contribution of each residue to small hydrophobic molecule binding. The mutants have been created via site-directed mutagenesis. Following expression and purification, we have begun fluorescence titration experiments with all-*trans* retinol. Once dissociation constants are determined for all-*trans* retinal and other small hydrophobic molecules, we plan to use this protein as a vehicle for drug delivery.

Toxic Effects of Ionic Liquids On The Germination And Root Development Of Alfalfa Seeds. *Placide Bisangwa¹, Xing Li², James Wishart³, Shaon Lall-Ramnarine² and Catherine McEntee¹, ¹Kingsborough Community College, Brooklyn, NY², Queensborough Community College, Queens, NY and ³Brookhaven National Laboratory.

Ionic liquids, which are salts that are liquid at room temperature, are fast emerging as the solvents of choice in the chemical industry. Their apparent non-volatility and varied uses make them highly coveted by chemists at large. Recently, IL's have begun to be used as electrolytes in experimental medical batteries. Because of their non-volatility it has been suggested that ILs are environmentally friendly, or *green*, solvents. Previous reports suggest that there is a degree of toxicity associated with ionic liquids which contain alkyl chain lengths of between 8-13 carbons. Using a seed germination and root elongation assay we demonstrate that this assay is more sensitive for testing the toxic effects of compounds such as ILs and that the toxicity of ILs is greater than that reported in the literature.

The Effects Of Different Sugars on Seed Germination and Root Growth. Solomon Bisangwa¹ and Dr. Catherine McEntee². ¹Brooklyn College, Brooklyn, NY, USA and ²Kingsborough Community College, Brooklyn, NY.

Literature suggests that the sugar trehalose can have inhibitory effects on germination and root elongation of *Arabidopsis thaliana*. Trehalose is a disaccharide produced by a wide variety of bacteria, fungi, and in some invertebrate animals. In *Arabidopsis*, decreased expression of genes controlling sugar breakdown is shown to occur when exogenous trehalose concentrations become high in the absence of other metabolizable sugars. The goal of this experiment is to determine the effects in vitro of the sugars sucrose, trehalose, glucose, galactose and maltose on the germination and growth rates of plants such as *Arabidopsis*, alfalfa, and clover. The plants were grown on MSR plant growth medium containing 150mM of each specified sugar. Trehalose was shown to severely slow the rate of root growth. Unexpectedly, the plants grown on galactose medium also displayed stunted root growth. We will next investigate the cause of these disparities in the rates of development. We intend to use RT-PCR to determine changes in gene expression of trehalose related genes and abscissic acid. This research could shed light on the methods by which plants utilize carbohydrates during and immediately following germination and widen the knowledge of the genes involved in carbohydrate metabolism and signaling.

Di-(2-ethylhexyl) Phthalate (DEHP) Affects *Drosophila melanogaster* Development Possibly Through Meiotic Defects During Spermatogenesis. *Kwesi W. Blackman¹, Penel Joseph¹, Janet E. Rollins² and Thomas M. Onorato³, ¹Kingsborough Community College, Brooklyn, NY, USA, ²College of Mount Saint Vincent, Riverdale, NY, USA, ³LaGuardia Community College, Long Island City, NY, USA.

Phthalates are infused with polymers to increase flexibility of plastics. Di-(2-ethylhexyl) phthalate (DEHP), one of the most commonly used phthalates, has adverse effects on the male reproductive system. Moreover, DEHP may shorten the lifespan of the fruit fly, *Drosophila melanogaster*, as well as increase lipid peroxidation, an indicator of oxidative stress. Therefore, this study determined whether DEHP affects *Drosophila* development. Adult wild-type flies were grown on insect medium (control) or insect medium with 500 mM DEHP. After 7 days this parental generation (P) was transferred to new vials and exposed to DEHP (500 mM) for an additional 14 days. The resulting F₁ generations from both long and short-term exposure were counted on day 21. Both exposures to 500 mM DEHP were found to have no adverse effects on the P generation as compared to control. No differences in the number of flies of the F₁ generation were observed after short-term exposure (7 days) to DEHP when compared to the matched control. Interestingly, longer exposure (21 days) to 500 mM DEHP reduced the number of flies in the F₁ generation when compared to the matched control. Phase contrast imaging of testicular squashes revealed abnormal association of nuclei with the nebenkern (mitochondrial structure) in round spermatids, which is indicative of a meiotic cytokinesis defect.

Evaluation Of *E. faecalis* And *E. faecium* Populations In The Upper Passaic River During Summer 2007. *Dean Chamberlain and June Middleton. Fairleigh Dickinson University, Madison, NJ, USA.

To determine the prevalence of the nosocomial pathogens *Enterococcus faecalis* (EFS) and *E. faecium* (EFM) in the Upper Passaic River in Morris County NJ., we isolated enterococci from the river at six sites monthly during summer 2007. Surface water was collected aseptically and total enterococci were isolated and verified by standard methods. We evaluated total counts, species distribution, and antibiotic resistance patterns. Virulence factor expression (gelatinase, hemolysin, and bacteriocin) was evaluated for selected EFS and EFM isolates. Of total enterococcal isolates (n=815), 36.8% were EFS and 7.1% were EFM. All isolates were evaluated against 10 antibiotics at clinically relevant concentrations. Greater than 85% of EFS and EFM isolates were resistant to ampicillin while none was resistant to vancomycin (30 µg/ml). Resistance to tetracycline, nitrofurantoin, ciprofloxacin and erythromycin was significantly higher in EFM than in EFS. Ninety-one percent of selected EFS isolates (n=96) and 2.4% of selected EFM isolates (n=42) produced gelatinase. Production of at least one bacteriocin was observed in 61.5% of EFS and 31% of EFM isolates while beta hemolysis was only observed in 3.1% of EFS isolates. The combination of antibiotic resistance and virulence factors is known to increase the pathogenic potential of microorganisms.

Mitogen-activated Protein Kinase Kinase-3,6 (MKK3,6) Is Not Involved In Contact Inhibition. *Samantha Cole and Dorothy Hutter, Monmouth University, West Long Branch, NJ, USA.

Mitogen activated protein (MAP) kinase pathways are signal transduction pathways that are necessary for the proliferation of cells. The p38 pathway is a MAP kinase pathway known to cause growth arrest in response to stress. Mitogen activated protein kinase kinase-3,6 (MKK-3,6) is an upstream kinase that phosphorylates tyrosine and treonine residues of p38, thus activating the p38 protein. MAP kinase phosphatases (MKPs) inactivate MAP kinase isoforms. Therefore MAP kinases are dually regulated; they are activated by MKKs and inactivated by MKPs. Previous results have shown the activity of p38 decreases upon contact inhibition. For this reason, p38 may have reduced activation upon contact inhibition. Therefore the levels of phosphorylated (active) MKK-3,6 were tested by western blotting in contact inhibited and proliferating cultures. Upon contact inhibition in normal fibroblast (BJ) cell cultures, it was found that the levels of MKK-3,6 remained constant. Similarly, fibrosarcoma (HT-1080) cell cultures not only lack contact inhibition, but also show no varying levels of MKK-3,6. It was concluded that upstream activation of p38 does not change upon contact inhibition.

Radio-Synthesis Of 6-([18Fluoroacetamido])-1-Hexanoic Anilide For Positron Emission Tomography Imaging Of Histone Deacetylases In Brain. *Shanika Collins¹, Kwesi Amoa¹ and Joanna Fowler², ¹Medgar Evers College, Brooklyn, NY, USA and ²Brookhaven National Laboratory, Upton, NY, USA.

6-¹⁸F-fluoroacetamido-1-hexanoic anilide (¹⁸F-FAHA) is useful in measuring histone deacetylase (HDAC) expression and activity in cancer patients via Positron Emission Tomography (PET) imaging and studying gene expression in brain. HDACs inhibition triggers growth arrest, differentiation and apoptosis in tumor cells. To evaluate HDAC expression in brain and other organs *in vivo*, before and during use of inhibitors, FAHA was developed as a substrate for non-invasive whole body imaging of HDAC. Our objective was to prepare ¹⁸F labeled FAHA to image HDAC in brain using PET imaging. FAHA was prepared by reacting 6-aminohexanoic acid with thionylchloride in dichloroethane followed by aniline. Resulting compound 1 was treated with bromoacetyl bromide in presence of triethylamine to afford compound 2 which was fluorinated using tetrabutylammonium fluoride to give unlabeled reference compound. The bromine substituted compound is a precursor to ¹⁸F-FAHA, used with HDAC inhibitor, suberoylanilide hydroxamic acid for PET imaging of HDAC expression and activity in baboon brains. This project was supported by LSAMP, USDE Office of Biological and Environmental Research, and 0516041071 of NYSDOE.

Abnormalities In Sex Ratios, Morphological Development, And Vitellogenin Production In Response To Bisphenol-A Exposure In *Oryzias latipes*. *Steve Cook and M.E. Royston, St. Joseph's College, 155 West Roe Boulevard, Patchogue, NY, USA.

Leaching from polycarbonates, epoxy resins, and dental sealants has been demonstrated to adversely affect natural wildlife, and is linked to developmental abnormalities. Polycarbonate plastics are light weight high-performance plastics that are widely used in the industrial world. Such polycarbonate products include: digital media devices, electronic equipment, sports equipment, medical devices, food storage containers and reusable plastic bottles. Bisphenol-A is a chemical compound that is used in the production of such polycarbonate plastics. For more than 70 years Bisphenol-A has been known to act as an endocrine disrupter. Although the range and severity of effects from these types of chemicals are unknown, these hormone mimics can affect normal growth and morphological development, reproduction, mood, and behavior. Recently endocrine disrupters have been closely correlated to mental retardation and declining sperm counts. The expression and increased production of vitellogenin, an egg yolk precursor protein, has been used as a biomarker to detect exposure to such chemicals. In this experiment, the effects of concentrated Bisphenol-A on sex ratios, morphological development, as well as vitellogenin production and expression in *Oryzias latipes* (Medaka) will be observed.

A Study of Heavy Metals In Marine Organisms In Jamaica Bay, NY. *Ashrain W. Corbie, Autumn R. Robbins, Mary T. Ortiz and Kristin Polizzotto, Kingsborough Community College, Brooklyn, NY, USA.

Heavy metals in marine life exist throughout food chains. In Jamaica Bay, NY, humans fish, despite the area being unsafe for acquiring food. A study was conducted during the summer of 2007 to determine the level of 11 heavy metals (Al, Cr, Mn, Fe, Ni, Cu, As, Cd, Hg, Tl, Pb) in organisms in two locations in Jamaica Bay: Runway Channel and Canarsie Pier. The goal was to measure heavy metal levels in benthic organisms and to determine which contained the highest levels of these elements. For each location, live organisms (snails, crabs, worms, algae) were dredged, dried, digested and analyzed using atomic absorption spectrometry. Sixteen specimen types were collected (3 algae, 13 invertebrates). Al, Cr, Mn, Fe, and Cu levels ranged 2000-37000 ppm. Ni, As, Cd, Hg, Tl and Pb levels ranged 0.18-500 ppm. The highest heavy metal levels in Runway Channel were in gastropods; those in specimens from Canarsie Pier were in hermit and spider crab soft tissue. These organisms may be eaten by bottom fish and then taken for human consumption. The literature reports Mn can cause Parkinson Disease; Pb may cause seizures. Heavy metals have harmful implications for humans. Public awareness for prevention is a priority.

G-Quadruplexes Are Conserved Near RNA Processing Sites Of Proto-oncogenes. *Melissa Hee Chung, Gadareth Higgs, Aileen Tolentino, Lawrence D'Antonio and Paramjeet Bagga, Ramapo College of New Jersey, Mahwah, NJ, USA.

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. We have used a computational approach (1) to map putative Quadruplex forming G Rich Sequences (QGRS) within the transcribed regions of a large number of mammalian genes. Our computational suite consists of a "QGRS Mapper" program (2) that can analyze genomic nucleotide sequences and the "GRSDB" database (3) for curation and further analysis of the QGRS Mapper generated data. At present, our database contains information obtained from ~30,000 eukaryotic genes that include large sets of alternatively processed pre-mRNAs and the genes involved in oncogenesis. The goal of the current project has been to study conservation of G-quadruplex structure motifs in near RNA processing site of proto-oncogenes and to explore their role in the human disease. These studies involve detailed comparisons of homologous genomic sequences and mapped G-quadruplexes near RNA processing sites. Our data indicate an evolutionary bias in the favor of G-quadruplex conservation near splice sites across the species and suggest an important role of G-quadruplex motifs in RNA splicing.

Blood Characteristics Of Two Quail Species. *Donald Dorfman¹ and K. Chapman², ¹Monmouth University, West Long Branch, NJ, USA, ²Lakewood H.S., Lakewood, NJ.

Comparisons of several blood characteristics of Japanese quail, *Coturnix japonica*, and bobwhite quail, *Colinus virginianus*, were made. Blood was collected, from the right ulnar artery, from a 17-day-old pre-hatchling and from hatched one to 50 day-old, and more than 150 day-old Japanese quail, and from one to 60 day-old bobwhite quail. Blood was centrifuged and the plasma separated from the red blood cells. Agarose gel electrophoresis was utilized to determine plasma and hemoglobin patterns, and densitometry to determine the area, in percent, for each band. Japanese quail have two adult hemoglobins, HbI and HbII, that are anodic, similar to bobwhite quail. However, Japanese quail have, and maintain a third cathodic band that is present for up to 38 days. This fetal hemoglobin band (HbF) is not evident in the electrophoretic patterns for bobwhite quail. For plasma proteins, seven bands were observed for Japanese quail and six for bobwhite quail. All of the plasma proteins are anodic, including a faint band that occurs in the region of the human pre-albumin area. Despite the similarity of the use of "quail" for both species, they are not closely related. Japanese quail are "old world" fowl, and bobwhite "new world" fowl.

Prevalence Of Periodontal Pathogens In The Third Moral Region. *Frandaluz Cuevas, Madell Collins, Dr. Raji Subramaniam and Dr. Patricia Schneider, Queensborough Community College, Bayside, NY, USA.

Severe forms of adult periodontal disease are associated with anaerobic gram-negative bacteria, in particular *Prophyromonas gingivalis*, *Treponema denticola*, and *Tannerella forsythensis*. Recent studies have linked the onset of periodontal disease in young adults with wisdom teeth or third molars. This study investigated the distribution of the three pathogens in wisdom teeth and in anterior teeth of patients at a private dental clinic. The BANA (N-benzoyl-DL-arginine-2-naphthamide) enzyme assay was performed on subgingival plaque samples taken during routine scaling. DNA was extracted from paper point samples of subgingival fluid. The polymerase chain reaction (PCR) detected specific pathogens based on the amplification of signature sequences of the small subunit 16S rRNA genes. No significant correlations were found between pocket depth, BANA intensity, patient age and bacterial distribution. *P. gingivalis* was found in 21% of patients. *T. forsythensis* was detected in only 7% of patients. No evidence of mixed infection was found. Results show marked difference in the pathogen population between the two regions. This suggests that while infection may have originated in the wisdom teeth, the pathogen population is not stable. Frandaluz Cuevas is a participant in the NIH Bridges to the Baccalaureate Program at Queensborough Community College (grant 1 R25 GM65096-05).

Visualization Of Chromatin and Analysis Of Transcription Of Ribosomal RNA Gene In Saccharomyces Cerevisiae Mutant Sstrain H3K4R. *Kelly Edebiri¹ and Dr. Anne Beyer², ¹St. John's University, Queens, NY, USA and ²University of Virginia, Charlottesville, VA, USA.

In another project, Miller chromatin spreading was also used to visualize and analyze a mutant strain of *Saccharomyces cerevisiae* (yeast). The mutant strain was the H3K4R strain, in which the mutant histone H3 tail has a change of lysine 4 to arginine. The preliminary experiment is to determine the effect of this mutation on transcription of the rRNA gene. The analysis involved comparing transcription of rRNA genes in both the mutant and control strain. The results derived from the experiment showed that the pol1 complexes on the rRNA gene chromatin were more on the control strain than on the H3K4R mutant strain. From this result, we concluded that the methylation of the lysine activates transcription of ribosomal genes. However, the rate of transcription of rRNA in the mutant strain was sufficient for proper growth.

Brain Catalase And Effects of Alcohol On Adolescents And Adults. *Salma Fathalla, *William Doherty and Dennis E. Rhoads, Monmouth University, W. Long Branch, NJ, USA.

Alcohol consumption by adolescents has prompted increased interest in the effects of alcohol on the developing brain. Rats can be used as a model for studying differences between adolescents and adults. Differences in responses to alcohol could arise during development of neurotransmitter systems or of metabolic processes involved in alcohol metabolism. Catalase accounts for ~ 60% of alcohol metabolism in the brain and its activity can influence the actions of alcohol. The present study was designed to compare catalase activities in the adolescent and adult brain using Long-Evans, Sprague-Dawley, and Wistar rat strains. Catalase activity was measured as decrease in hydrogen peroxide [H₂O₂] with time using a coupled assay. Comparison of the adolescents showed no differences among the three strains. Furthermore, no differences were observed between adolescent and adult rats. In all cases, there was ~50% increase in catalase levels following chronic consumption of an ethanol-containing liquid diet. In conclusion, differences between adolescent and adult rats in response to alcohol consumption are not associated with the enzyme catalase. The increase in brain catalase following chronic alcohol consumption (observed at both ages and in all three strains) is presumably a response to oxidative stress and requires further study.

Angiotensin-(1-7) Inhibits Atherogenesis By Increasing Macrophage ATP Binding Cassette Transporter A1 Expression. *Charles A. Hall, Xuewei Zhu, John S. Parks, Linda C. Moore, Carlos M. Ferrario and William B. Strawn. Hypertension & Vascular Research Center, Wake Forest University School of Medicine, Winston-Salem, NC, USA. Baruch College, New York.

Atherosclerosis is the leading cause of coronary artery disease. The formation of macrophage foam cells in the intima of arteries results in the earliest recognizable lesion in the atherosclerotic process, the fatty streak. Foam cells are formed when macrophages accumulate excess cholesterol. The membrane bound protein; ATP Binding Cassette Transporter A1 (ABCA-1) is responsible for the efflux of free cholesterol. Emerging evidence suggests that Angiotensin II inhibits macrophage ABCA-1 expression thereby increasing foam cell formation. Because Angiotensin – (1-7) has been shown to exert effects opposite to that of Angiotensin II, we hypothesized that Angiotensin – (1-7) would decrease foam cell formation via up regulating the expression of (ABCA-1). Furthermore the infusion of Angiotensin-(1-7) in mice has been shown to significantly reduce atherosclerosis in aortic root of mice. Until now a possible mechanism for this finding has yet to be discovered. The study used Human monocyte derived macrophages (THP-1) stimulated with Angiotensin-(1-7). Angiotensin – (1-7) receptor blockade was also done to determine if effects were receptor mediated. THP-1 macrophage ABCA-1 protein expression was determined by western blot analysis using cell lysates. Treatment with Angiotensin-(1-7) increased THP-1 macrophage ABCA-1 protein expression compared to vehicle treatment. Blockade of the angiotensin-(1-7) receptor reversed this effect.

Investigating The Selenocysteine Pathway For The Incorporation Of Unnatural Amino Acids. *Wendy Hom¹, Man Xia Lee¹, Susheel Kumar Gunasekar¹ and Jin K. Montclare^{1,2}, ¹Polytechnic University, Brooklyn, NY, USA, ²Downstate Medical Center, Brooklyn, NY, USA.

The proteins of all the organisms that we know of are made up of the basic twenty amino acids that are linked together by peptide bonds. For the past few years, a great deal of research has been put into understanding the mechanism of the incorporation of non-natural acids into proteins. The ability to synthesize unnatural amino acids can lead to the expansion of the genetic code for many organisms, which lead to changes in the properties of the protein. One unnatural amino acid that has been under extensive study is selenocysteine, the twenty-first amino acid. In this study, we have engineered constructs to test the ease of incorporation of nucleophiles into *E. coli* proteins *in vivo*. We demonstrate that we can incorporate certain nucleophiles using a test fusion protein of formate dehydrogenase and β -galactosidase (fdhF-lacZ).

The Neurotoxic Effects Of Manganese On The Dopaminergic Innervation Of The Gill Of The Bivalve Mollusc, *Crassostrea virginica*. *Turkesha Huggins, Kesha Martin, Margaret A. Carroll and Edward J. Catapane, Medgar. Evers College, Brooklyn, NY, USA.

Lateral cilia of gill of *Crassostrea virginica* are controlled by a serotonergic-dopaminergic innervation from their ganglia. Serotonin is an excitatory neurotransmitter at ganglia and gill, causing cilio-excitation. Dopamine is an excitatory neurotransmitter within ganglia, but an inhibitory neurotransmitter at gill, causing cilio-inhibition. We examined effects of manganese on the innervation of gill. High levels of manganese are neurotoxic and cause Manganism, a Parkinsons-like disease in humans. Beating rates of lateral cilia in gill epithelial cells were measured by stroboscopic microscopy of preparations having the ipsilateral cerebral and visceral ganglia attached, only the ipsilateral visceral ganglia attached, and isolated gill preparations. Animals were treated 3 days with manganese (0.05 - 1.0 mM), then tested by superfusion of the cerebral ganglia, visceral ganglia and gill with dopamine and serotonin. Acute treatments with manganese caused significant, dose dependant impairments of the dopaminergic system, but not the serotonergic, in agreement with the method of action of manganese toxicity in humans. This study demonstrates this preparation is a useful model to study manganese neurotoxicity and the pharmacology of drugs affecting it and biogenic amines. This work was supported by grants 2R25GM06003-05 of NIGMS, 0516041071 of NYSDOE, 0622197 of NSF and 67876-0036 of PSC-CUNY.

Presence Of The Antiapoptotic Protein Mcl-1 In The Normoxic And Ischemic Testis. *Jaclyn Horvath, *Anoop Shah, *Rebecca Tyson and Dr. Michael A. Palladino' Monmouth University, West Long Branch, NJ, USA.

Testicular torsion occurs from a twisting of the spermatic cord, resulting in diminished blood flow (ischemia) to the testis. The ischemic testis then reaches a state of hypoxia, a deficiency in the amount of oxygen in the tissue. When torsion occurs, germ cell-specific apoptosis following ischemia can lead to aspermatogenesis and infertility. Yet other cells such as Leydig and Sertoli cells do not undergo apoptosis following testicular torsion. Previously, we have shown that the transcription factor hypoxia-inducible factor-1 (HIF-1), a key regulator of oxygen homeostasis, is abundantly expressed in both the normoxic and ischemic testis. Our working hypothesis is HIF-1 may activate the antiapoptotic gene, *Mcl-1*, to protect Leydig cells, the androgen-producing cells of the testis, from apoptosis following torsion. The goal of this project was to detect *Mcl-1* protein in the ischemic and normoxic rat testis. Cytoplasmic and nuclear proteins were extracted from sham and experimentally-torsed rat testes and analyzed for the presence of *Mcl-1* protein by Western blotting. Results showed that *Mcl-1* was present in both ischemic and normal testes, and that the levels of *Mcl-1* remained constant. These results support our hypothesis that *Mcl-1* could play important roles in antiapoptotic protection of Leydig cells following testicular torsion.

Detection Of A Single Nucleotide Polymorphism In The Human OR3A1 Olfactory Receptor Gene That Discriminates Between An Intact And Pseudogene Allele. *Lindita Ismaili and Craig S. Hinkley, Kingsborough Community College, Brooklyn, NY, USA.

In mammals, initial detection of chemical odorants occurs when an odorant interacts with a specific olfactory receptor (OR) in the neuroepithelium of the nasal cavity. The human OR receptors are encoded by 1000-1400 genes. Although OR receptors are known to bind odorants, the specificity of ligands has not been determined for most receptors. In mice, 20% of the OR genes are pseudogenes, but surprisingly, over 60% of the human OR genes are pseudogenes or are segregating between intact and pseudogene alleles. OR3A1 is a segregating human OR gene with an intact allele frequency of 55% and a pseudogene allele frequency of 45%. We have developed a PCR-based assay that detects a single nucleotide polymorphism which discriminates between the intact and pseudogene alleles of the OR3A1 gene. We plan to use this assay to determine the genotype of individuals and then test these individuals for their discrimination of different odorants. This information can be used to correlate odorant discrimination with functionality of the OR3A1 receptor and could be used for determination of ligand specificity of other OR receptors. L. Ismaili is a student participant in the Collegiate Science and Technology Program of the NY State Education Department, grant number 0516051091.

Initial Studies Toward Dissecting The Mechanisms Of Ionic Liquid Toxicity. *Jenelle Jack¹ Xing Li² Sharon - Lil Ramnarine², James Wishart³ and Catherine McEntee¹, ¹Kingsborough Community College, Brooklyn, NY, ²Queensborough Community College, Queens, NY and ³Brookhaven National Laboratory, Upton, NY, USA.

Green solvents are environmentally friendly solvents derived from agricultural crops. They are found under the subtitle of "green chemistry" which is used in bio engineering in processes that reduce or eliminate hazardous substances while generating little or no toxicity to humans and the environment. Ionic Liquids (ILs), because of its high solubility and low vapor pressure, are being researched as potential environmentally friendly solvents. However, toxicity studies of ILs indicate not all are safe. Our studies aimed at dissecting mechanism(s) of toxicity of ILs in order to understand impactS ILs will have on the environment. *Pseudomonas aeruginosa*, *Staphylococcus aureus*, *Bacillus subtilis* and *Klebsiella pneumoniae* were grown in tryptic soy broth for 24 hrs then transferred into 96 well plates. Each row of the plates contained 10 fold serial dilutions of specified ILs with fresh media. The concentrations ranged from 10 to 0.1mg/ml. At different intervals cells were replica plated onto Omniwell tryptic soy agar plates to determine viability. Response of the bacteria to ILs varied due to differences in alkyl chain lengths of the ILs, in agreement with published results. Additionally, *S aureus* and *B subtilis* were more sensitive to the toxic ILs than the other bacteria. Possible reasons for this result will be discussed.

Using Hybrid Spheroids To Assay Cancer Stem Cell Sensitivity To Ionizing Radiation And Chemotherapeutics. *Shy'Ann Jie¹, Davina Etwaru², B. Djordjevic³, G. Von Walstrom³ and C.S. Lange³, ¹Medgar Evers College, Brooklyn, NY, ²Barnard College, New York, NY and ³Downstate Medical Center, Brooklyn, NY, USA.

The cancer stem cell hypothesis postulates a small fraction of a tumor is responsible for its growth and cure requires sterilization of these cells. We used hybrid spheroids (HS) to assay tumor radio- and chemo-sensitivity. We maintained a cell line of human fibroblast (AG 1522) to make HS; chemically digested cervical carcinoma tumors to model *in situ* cell interactions; scored growth; observed mitotic cellular morphology; and analyzed data. HS measurements shrank from original size when incubated for several days then stayed at that size or grew as AG 1522s died off. HS growing past the original size is due to proliferation of cancer cells. Results indicate it is possible to discriminate between normal and neoplastic cells depending if grow in HS. This could lead to a system that suitable for testing cancer treatment strategies for individual patient in an *in vivo* environment. Ms. Jie is a participant in CSTEP of Medgar Evers, funded by 0516041071of NYSDOE.

Initial Steps In Determining The DNA Barcode For Ribbed Mussel (*Geukensia demissa*) Species Identification. *Lynique Johnson and Sarwar Jahangir. Kingsborough Community College, Brooklyn NY, USA.

The ribbed mussel is a dominant salt marsh species in the West Atlantic Coast. It is distributed from Gulf of St. Lawrence to Yukatan, with abundance from Cape Cod to Florida, and introduced in the west coast of USA. It remains attached to stems and roots of *Spartina alterniflora* by byssal threads, supporting the marsh against erosion, plays a major role in the saltwater food web cycling carbon, nutrients, and minerals. Blue crabs (*Callinectes sapidus*), other crustaceans, gastropods, and birds depend on it as food. In spite of its wide distribution and ecological importance, its species identification population structure remains unresolved. In this study we are planning to develop ribbed mussel mitochondrial cytochrome-c oxidase subunit I (COI) DNA barcode to enable one identify it from tissue remains, eggs and larvae for management. We collected multiple ribbed mussels locally, tissue extracted and cells separated, lysed using 1% SDS, digested with proteinase K, centrifuged at 10,000 g to collect mitochondria, lysed mitochondria and separated the DNA by phenol extraction followed by ethanol precipitation. The DNA was measured using UV spectrophotometer and will be amplified using COI DNA primers (GTTCAACAATCATAAAGATATTGG and TAACTTCAGGGTGACCAAAAATCA) in PCR. DNA sequences from \$three samples will be aligned to develop a ribbed mussel DNA barcode and published. The research was partially supported by CSTEP NY State grant.

Methamphetamine Regulates Dopamine Transporter Function When It Partitions Into Non-raft Membrane Microdomains. *Bianca Jones, J. Shawn Goodwin and Habibeh Khoshbouei, Meharry Medical College, Vanderbilt University Summer Science Academy.

Dopamine transporter (DAT), the main target of psychostimulants such as amphetamine and methamphetamine, is an integral membrane protein that resides in both lipid raft and non-lipid raft membrane fractions. DAT is the major molecular target responsible for the rewarding properties of psychostimulants, such as amphetamine and methamphetamine. Using the lateral diffusion of membrane proteins, we have found that: 1) DAT selectively partitions into different membrane microenvironments when membrane is loaded or depleted of cholesterol. 2) Amphetamine and methamphetamine effect lateral diffusion of DAT in similar fashion, as when plasma membrane is depleted of - or loaded with - cholesterol. 3) Methamphetamine decreases and amphetamine increases DAT's rate of lateral diffusion, 4) Methamphetamine increases intracellular Ca ($[Ca^{2+}]_i$) via DAT more effectively than amphetamine. Thus, one of the molecular mechanisms involved in DAT-mediated increase in $[Ca^{2+}]_i$, might be the membrane microenvironments surrounding DAT molecule. We tested whether amphetamine and methamphetamine differentially regulate DAT-mediated rise in $[Ca^{2+}]_i$ when DAT molecule partitions into different membrane microdomains. We found that when the plasma membrane is depleted of cholesterol, methamphetamine-mediated $[Ca^{2+}]_i$ is increased. Therefore, partitioning of DAT into various membrane microdomains may contribute to pharmacology of psychostimulants providing a principal molecular mechanism of action of methamphetamine.

Determination Of Total Estrogen (Estrone + 17 β -Estradiol + Estriole) Concentrations at Selected Sites In Jamaica Bay, New York. *Sixtina Jones, Maria Norako and Gary Sarinsky. Kingsborough Community College, Brooklyn, NY.

Hormonal steroids excreted by humans and animals enter the environment through the discharge of domestic sewerage effluents. These compounds can have an impact on human health and wildlife by disrupting their endocrine systems. Estrone (E1), 17 β -Estradiol (E2) and Estriole (E3) are predominantly female hormones that play important and varying roles in differentiation, development and reproduction. This experiment was designed to determine the total estrogen (E1 + E2 + E3) concentrations at six sites in Jamaica Bay, New York. Three of the sites tested the effluents from sewerage treatment plants. The samples were pretreated by solid phase extraction followed by an ELISA Assay. Standard solutions were prepared and measured at an absorbance of 450 nm and a standard curve was generated. The total E1 + E2 + E3 concentration in a sample was determined from its absorbance reading and interpolated from the standard curve. The results of this experiment showed that total estrogen concentrations ranged from 54 ng/L to 118 ng/L. There was no significant difference between the sewerage treatment locations and the other sites. This research will lead to further studies which will attempt to determine the effects of estrogen on selected marine organisms residing in Jamaica Bay.

Nickel Chloride (1mM) Treatment Affects The Development of *Drosophila melanogaster*. *Penel Joseph¹, Kwesi W. Blackman¹, Janet E. Rollins² and Thomas M. Onorato³, ¹Kingsborough Community College, Brooklyn, NY, ²College of Mount Saint Vincent, Riverdale, NY and ³LaGuardia Community College, Long Island City, NY, USA.

Nickel, although it is an essential natural element, can be very harmful at high levels of exposure. The general public is exposed to nickel through ingestion and inhalation; food being the major source of nickel exposure. Previous animal studies in mice and zebrafish have shown that nickel has adverse effects on the male reproductive system and animal development. Decreases in live pups per litter and increased pup mortality have been reported after exposure to soluble nickel salts. Furthermore, exposure to nickel (both ingestion and inhalation) results in sperm abnormalities and decreased sperm counts in these organisms. The fruit fly, *Drosophila melanogaster*, is an economical and well-established model organism for studying reproduction and development; research that can be translated to humans. Therefore, we investigated the effect of nickel chloride treatment on the development of the fly. Adult wild-type flies (parental generation) were grown either with exposure to 1mM nickel chloride or just food as a control. The resulting F₁ generation was counted. Although 1mM nickel chloride treatment did not affect the lethality of the parental generation, there was a significant reduction in adult flies (43%, p= 0.0324) of the F₁ generation after 14 days of exposure to 1mM nickel chloride. Our findings are consistent with animal studies showing that nickel exposure affects pup development.

DNA Barcoding Of The Eastern Oyster (*Crassostrea virginica*) For Species Identification. Mohamed Kattaria and Z.M.G. Sarwar Jahangir, Kingsborough Community College, Brooklyn NY, USA.

Eastern oyster (EO) is distributed throughout the Atlantic coast of Canada until Panama, and transplanted into many coasts including western Canada, US, Mexico, Hawaii, Fiji, Japan, UK and others. Due to its high demand as seafood, it is also raised in aquaculture. The US EO landings declined to 2% from 73 million Kg in 1900 to 1.5 million Kg in 2002 due to overutilization and habitat destruction. Due to its important ecological role, the Ecosystem Advisory Service demanded EO to be listed as threatened/endangered in 2005 for conservation. In spite of its diversity, due to morphological plasticity, its population and species identification is obscure, but essential for management. Species identification using physical characteristics is limited. A highly conserved mitochondrial gene, cytochrome-c oxidase subunit I (COI) is known to vary between species due to degenerative codons and wobble, making it an excellent candidate DNA barcode for EO species identification. We obtained EO locally, isolated, minced and grounded its tissue in 1XSSC and TE (pH 7.5), centrifuged at 800 g. Centrifuged the supernatant at 10,000 g, collected mitochondria pellet, and extracted the DNA using the BioVision Kit. DNA from three EO will be amplified using PCR, and COI primers (GTTCAACAAATCATAAAGATATTGG and AAACCTCAGGGTGACCAAAAATCA), sequenced, and aligned to identify EO consensus COI DNA barcode. The research was partially supported by CSTEP NY State grant.

The Effects Of p-Aminosalicylic Acid On The Neurotoxicity Of Manganese On Biogenic Amines In The Nervous System And Innervated Organs Of *Crassostrea virginica*. *Candice King, Marie Myrthil, Margaret A. Carroll and Edward J. Catapane, Medgar Evers College, Brooklyn, NY, USA.

Manganese, a neurotoxin inducing Manganism, a Parkinsons-like disease, injures brain dopamine neurons. p-Aminosalicylic acid is being used to alleviate symptoms of Manganism in humans, but its mechanism of action is unknown. *Crassostrea virginica* possesses a dopaminergic system innervating the gill and regulating lateral ciliary activity. Previously we reported manganese caused reductions in dopamine levels in cerebral ganglia, visceral ganglia and gill, but not norepinephrine, octopamine or serotonin, consistent with reported mechanisms of action of manganese in humans. We now studied effects of p-aminosalicylic acid on the neurotoxicity of manganese. *C. virginica* were exposed to 0.5 and 1 mM of manganese with and without 0.5 and 1 mM p-aminosalicylic acid for 3 days. Controls were similarly treated without manganese or p-aminosalicylic acid. Amines were measured by HPLC with fluorescence detection. p-Aminosalicylic acid protected ganglia and gill against 0.5 mM manganese, but not 1 mM manganese. We did not see similar results for serotonin. This study demonstrates p-aminosalicylic acid protects against the neurotoxicity of manganese, but is concentration dependent. These findings provide insights into actions of p-aminosalicylic acid in treatments of Manganism. This work was supported by 2R25GM06003-05 of NIGMS, 0516041071 of NYSDOE, 0622197 and 0420359 of NSF and 67876-0036 of PSC-CUNY.

Gene Expression Of Inflammatory Cytokine IL-17 During The Course Of Experimental Autoimmune Myocarditis (EAM). *Christina Lamb^{1,2}, G. Christian Baldeviano^{1,2}, Daniela Čiháková¹ and Noel R. Rose^{1,2},¹Johns Hopkins School of Medicine and ²Johns Hopkins Bloomberg School of Public Health.

Myocarditis is an inflammation of the heart muscle, and cytokines play a critical role in influencing the outcome of the immune response. Traditionally, organ-specific autoimmune diseases were thought to be driven by a Th1 pathway. Recent research, however, suggests that tissue damage in several autoimmune disease models may be due to Th17 CD4 T helper cells that express IL-17, IL-17F, and TNF alpha^[1,2]. In order to further assess the specific role of IL17 on EAM, we studied the gene expression of IL17 after EAM induction. Data from IL-17 gene expression during EAM must be reevaluated by increasing the concentration of cDNA used in amplification. This will shift the amplification curve to the left and increase the reliability of the data. In addition, since IL-13 deficient mice develop a severe EAM, we assessed gene expression of IL-17 in this model. There appears to be an up regulation of IL-17 gene expression in WT mice after EAM induction. Interestingly, IL-13 deficient mice do not seem to up regulate IL-17 at the same level. This observation agrees with previous data showing that IL-13 deficient mice have decreased levels of IL-17 in spleens and hearts at day 21.

Machine Learning Designs For Artificial Histone Acetyltransferases. *Man Xia Lee, Zhiqiang Liu, Aye Sandar Moe, Jin K. Montclare, Phyllis Frankl and Lisa Hellerstein, Polytechnic University, Brooklyn, NY, USA.

In vivo incorporation of non-natural amino acids can be used to improve protein stability. However, there is a trade off; improved stability of the protein may lead to loss in activity. One way to improve function is to employ machine-learning algorithms to identify the variants that improve activity. Our target protein *Tetrahymena* GCN5 (tGCN5), a member of the Histone Acetyltransferases (HAT), acetylates the lysine residues of the histones, enabling transcriptional regulation. Experimental data have shown an increase in stability against protease but loss in activity with the incorporation of p-fluorophenylalanine into tGCN5 *in vivo*. With the aid of computer guidance, we plan to design a set of fluorinated variants. Using information from biochemical and structural data, we identified eleven residues to mutate. One of the supervised machine learning algorithms, Linear Regression Analysis, will be used to identify the residues that have positive impact on the mutated sequences.

Effects Of REST Overexpression On Neocortical Neuronal Progenitors *In Vivo*. *Alberto Legoute¹, Faiez Siddiqi², Christopher Fiondella² and Joseph J. LoTurco²,¹Medgar Evers College, Brooklyn, NY, USA, ²University of Connecticut, Storrs, CT, USA.

A prerequisite for neurogenesis is turning on and off genes promoting neuronal features. REST (Neuron Repressor Element Silencing Transcription Factor) is responsible for repressing expression of neuron-specific genes in glial cells. REST is expressed in progenitors preceding neurogenesis, then turned off during differentiation. Turning off REST is believed to allow proper neuron development. We demonstrate REST overexpression in progenitors alters neuron migration and morphology but not completely block development of all neuronal features. Progenitors of embryonic Wistar rats were transfected *in utero*. Using immunocytochemistry, coronally sections of cortex were processed. Transfected cells neither developed properly nor migrated radially to appropriate locations. They clustered in progenitor stages in white matter. Staining confirmed the cells were positive for the REST gene and were not glia. Tissues stained with NeuN antibody had cells 100% positive for neuronal fates whereas only 83% positive for the REST gene. We conclude transfecting cells with pCAG-REST-IRES-eGFP plasmid disrupted cell migration and cell placement. The maintained expression of REST will not completely block cell development and neuronal identity, only appropriate cell placement and morphology. Alberto Legoute is a participant in the CSTEP and NSF-STEP programs of Medgar Evers College, funded by 0516041071 of NYSDOE and 0622197 of NSF.

Glucocorticoids Suppress Stress-Induced Activation Of Extracellular Signal-Regulated Kinase In The Paraventricular Nucleus Of The Hypothalamus. *Lucy Leid¹, Erin Jarvis² and Robert L. Spencer², ¹Medgar Evers College, Brooklyn, NY and ²University of Colorado, Boulder, CO.

Extracellular signal regulated kinase (ERK) is a member of the Mitogen-activated protein kinases (MAPKs) family. During stress, ERKs activate in the Paraventricular nucleus (PVN) of the Hypothalamus. It is thought interruption of this pathway inhibits signal transduction response mechanisms that alter secretion of hormones during stress. This study focused on effects glucocorticoid negative feedback has on activation of ERK. We applied a 2 x 2 factorial design using Sprague Dawley rats (N=16). Half the rats were adrenalectomized, ADX, and SHAM surgery was performed on the remainder. Half of both groups were subjected to no stress or 15 min restraint stress. Immunohistochemistry was used to determine activation of ERK in the PVN. Acute restraint stress produced detectable amounts of activated ERK. ADX stressed rats showed significantly increased amount of activated ERK. ADX and SHAM no stress rats showed no differences in activation of ERK. These results suggest it is feasible to inhibit activation of ERK with glucocorticoid pretreatment. This project was supported by the SMART Program of the University of Colorado, Boulder. Lucy Leid is a participant in the CSTEP and NSF-STEP programs of Medgar Evers College which are funded by 0516041071 of NYSDOE and 0622197 of the DUE Program of NSF.

A Day At The Beach? Fuhgeddaboutit. *Karen Lewis and Anthea M. Stavroulakis PhD. Kingsborough Community College, Brooklyn, NY, USA.

Hundreds of people spend time at the beach, but recent beach ratings have caused periodic closure of regional beaches in New York which were deemed unsafe due to high bacterial levels. This study follows up and expands last year's, including additional study areas and experimentation to assess bacterial types and levels in four regional beaches. Our hypothesis that high bacterial levels would also be seen this year was confirmed. Winogradsky columns constructed using sediment and water demonstrated the metabolic diversity of microorganisms. H₂S formation by sulfur-reducing bacteria in all columns was demonstrated; this could alter the sediment environment and nutrient cycling, turning it a black color. Presumptive tests designed to determine presence of coliform organisms in a water sample tested positively in all beaches, which can cause harm to humans if they ingest the water. Compared to last year's results, coliforms were still present, confirming our hypothesis. Coliforms are present in areas people access for swimming as well as areas not utilized for swimming, thereby reaffirming the need to address the safety of these publicly accessed areas. This work was supported by the Bridges to the Baccalaureate Program [NIGMS grant #1R25GM62003-01] and the CSTEP Program of the NYS Education Department.

Interleukin-10 Inhibits Dendritic Cell (DC) Activity By Inducing Apoptosis Of Precursors Newly Committed To DC Growth. *Jean Bernard Lubin¹, Danielle L. Kurkowski¹ and Frances Santiago-Schwarz^{1,2}, ¹Farmingdale State University, Farmingdale, NY,² and SUNY at Stony Brook, Stony Brook, NY, USA.

Dendritic cells are antigen presenting cells that regulate adaptive (antigen-driven) immunity. Monocyte-macrophages, while sharing functions with DCs, promote innate (nonspecific) immunity. DCs and mono-macrophages share a common precursor. Proteins known as cytokines regulate the growth of DCs from these precursors. Interleukin-10 (IL-10) is a cytokine that suppresses DC growth. However, molecular mechanisms underlying this suppression remain poorly characterized. We hypothesized that IL-10 inhibits DC activity by initiating an apoptotic (programmed cell death) schedule at the onset of DC growth from monocyte/DC precursors. To test our hypothesis, peripheral blood precursors were cultured with cytokines sustaining DC growth (GM-CSF/IL-4) in the absence/presence of IL-10. Temporal analyses of annexin V binding and cell morphology verified that IL-10 induces apoptosis within 48 hrs. In order to identify IL-10 targeted cells, we designed a flow cytometry-based strategy allowing simultaneous evaluation of apoptosis and cell surface phenotype (immunofluorescence analysis). Our results substantiate that IL-10 mediates apoptosis of monocyte/DC precursors while sparing monocyte-macrophage like cells. Surviving cells exhibited exceptionally high phagocytic ability but lacked the capacity to stimulate naïve T cells (a hallmark function of DCs). Thus, IL-10 regulates DC activity by killing monocyte/DC precursors upon commitment to DC growth while enhancing monocyte-macrophage survival and innate immunity. This work was supported in part by the Arthritis Foundation, Long Island Chapter and BIGC IFR at FSC.

Crystallization And Crystallography Analysis Of Amidohydrolase Enzyme From The Structure Genomic Project. *Arshad Mahmood¹, Jennifer Levia¹, Ann C. Brown¹, S. Kumaran² and S. Swaminathan², ¹Medgar Evers College, Brooklyn, NY and ²Brookhaven National Laboratory, Upton, NY, USA.

The crystal structure of an *amidohydrolase* (target ID 9355e) has been obtained to 2.35 Å resolution. Diffraction data were collected at the National Synchrotron facility of Brookhaven National Laboratory (beam-line X29). The crystals obtained by the sitting drop vapor diffusion method were 0.1 x 0.06 x 0.05 mm³ in dimension. The crystals belong to the tetragonal space group P4 with unit-cell parameters a=b=144.74 Å, c =100.96 Å. In this tetragonal crystalline structure of 9355e there was one dimer per asymmetric unit. *Amidohydrolase* includes the families of enzymes that catalyze the cleavage of wide range of substrates bearing amide or ester functional groups at Carbon and Phosphorus centers. This enzymatic reaction is common in various metabolic processes thus it is important to understand this reaction at the molecular level. Therefore, by knowing the three-dimensional structures of these enzymes and their active sites, we can predict their function and the catalytic mechanism.

Using The Development Of *Manduca sexta* As A Biomarker For The Presence Of Steroid Hormone Mimics. *Jennifer Martinez and M.E. Royston, St. Joseph's College, Patchogue, NY, USA.

Steroid hormone mimics are endocrine disrupting contaminants that may behave as agonists or antagonists to a preexisting hormone, or may alter the synthesis and/or degradation of hormones. Bisphenol A, a steroid hormone mimic, is receiving much attention because of its large production rate in the manufacturing of polycarbonates such as food containers, industrial detergents, and dental fillings. Research has supported the hypothesis that Bisphenol A acts as an estrogen receptor agonist. However, since experimentation on human beings is prohibited, a biomarker is necessary to detect steroid hormone mimic exposure. The *Manduca sexta* is a common organism used for experimentation due to short life cycles, easily accessible organ systems, and large larval structure. An insect hormone related to estrogen is ecdysterone, which can be found in the salivary glands of *Manduca sexta*. Ecdysterone is a steroid hormone that is responsible for each moult during the egg to pupa stages. In this experiment, the salivary glands of *Manduca sexta* will be analyzed for morphological alterations and hormonal abnormalities due to Bisphenol A exposure.

Effects Of Diltiazem And Lanthanum On Copper Inhibition Of Mitochondrial O₂ Consumption Of Gill Of *Crassostrea virginica*. *Kwanza McCoy, Edward J. Catapane and Margaret A. Carroll, Medgar Evers College, Brooklyn, NY, USA.

Tissues of *Crassostrea virginica* accumulate from their surroundings copper and other metals in excess of environmental levels. Mitochondrial O₂ consumption in *C. virginica* gill and isolated gill mitochondria is inhibited by copper. We studied effects of two metal transport blockers, diltiazem and lanthanum, on actions of copper on O₂ consumption in gill mitochondria using a YSI Micro-Biological Oxygen Monitor with micro-batch chambers. CuSO₄ (1-20 mM) decreased O₂ consumption. Diltiazem (5-10 mM) did not alter O₂ utilization but reduced inhibitory effects of copper. Lanthanum (5-10 mM) less effectively protected against copper and itself inhibited O₂ utilization. We demonstrate diltiazem is effective in blocking copper's inhibitory effects. The effects of copper on gill mitochondria are physiologically significant to growth and health of oysters and other marine animals living in a copper polluted environment. A copper uptake blocker could be of benefit for preventing diseases caused by high serum copper levels in humans. This work was supported by grants 2R25GM06003-05 of NIGMS, 0516041071 of NYSDOE, 0622197 of NSF and 67876-0036 of PSC-CUNY.

Analysis Of Lipids And Fatty Acids In Nuclear Fractions Of NMU Rat Mammary Tumor Cells After Treatment With Dietary Fatty Acids. *Brentnol McPherson¹, Joanne Tillotson² and Joseph Skrivanek². ¹Kingsborough Community College, Brooklyn, NY and ²Purchase College, Purchase, NY, USA.

Previous reports have documented the effects of omega-3 and omega-6 fatty acids on cell proliferation in tumor cells. Linoleic acid (LA) (omega-6) has been shown to increase cell proliferation, where as docosahexaenoic acid (DHA) (omega-3) has been shown to decrease proliferation. In this study, we used subcellular fractionation techniques followed by lipid isolation and fatty acid analysis to investigate the mechanism behind these effects. Using cell fractions enriched in nuclei, we are examining the abundance of lipids and fatty acids in treated cells using the methods of thin layer chromatography (TLC) and Gas Chromatography/Mass spectrometry (GC/MS). Cells treated with DHA and LA had a similar pattern for phospholipids with all being present. Cholesterol levels varied from fraction to fraction. Fatty acid analysis revealed that only the nuclear fraction contained arachidonic acid (AA) and that the amount of AA increased 1.5 fold upon treatment with LA. Supported in part by Grants: NIH 62012-04 and NSF DUE 0524965.

Metal Concentrations In Tissues And Shell Of *Crassostrea virginica* And *Geukensia demissa* In NY Hudson River Estuary And Long Island Sound Using Synchrotron Radiation. *Soren Murray¹ and Keith Jones². ¹Kingsborough Community College, Brooklyn, NY and ²Brookhaven National Laboratory, Upton, NY, USA.

Bivalves filter feed suspended food particles in water. Metals and contaminants found in the filtered food, silt and water are absorbed and reflected in their shells and tissues. Synchrotron radiation can be used to determine concentrations and locations of contaminating elements in shells indicating multi-year time span and soft tissue indicating compounds that may be recycled into the environment when the bivalve dies. *Crassostrea virginica* and *Geukensia demissa* shell and tissues were taken from NY Hudson Estuary, Long Island Sound, known contaminated and uncontaminated locations. Gill, adductor muscle, foot and digestive track were analyzed at the National Synchrotron Light Source using the x26a beamline for Ni, Ti, Cr, Zn, Cu, Fe, Mn, Pb, As and Sr at 27 sites. Results show Ni and Fe tend to be high, Zn was very high at several sites and Mn was moderately high. Cu and Pb were low. This work was supported by grants 2R25GM06003-05 of NIGMS and the CSTEP Program of NYSDOE.

Image Analysis Of Insulin-Like Growth Factor-II Receptor Expression In HIV Encephalitis. *Ryan Natividad¹, Meng-Liang Zhao², Hannah Suh², Sunhee C. Lee² and Melissa Nashat^{1,2}, ¹Borough of Manhattan Community College, New York, NY and ²Albert Einstein College of Medicine, Bronx, NY, USA.

IGF-IIR (also known as the mannose-6-phosphate receptor) is an important transmembrane glycoprotein that facilitates trafficking of lysosomal enzymes and degradation or activation of various ligands. The expression of IGF-IIR in human brain is not well-characterized. Therefore, this project investigated the expression of IGF-IIR in normal human brain and the inflammatory disease HIV encephalitis (HIVE). HIVE is the pathological correlate of HIV-associated dementia and occurs when HIV proliferates in the brain. Sections of frontal cortex were used and patient material (provided by the Manhattan HIV-1 Brain Bank) was grouped according to HIV serostatus. A polyclonal anti-IGF-IIR antibody (courtesy of Peter Lobel) was used for immunohistochemistry. Images of white matter were captured using a digital camera and were analyzed with NIH Image J. Normal brain (HIV-) and HIV-seropositive brain without encephalitis (HIV+), exhibited IGF-IIR immunoreactivity in intravascular immune cells and neurons, but parenchymal staining was minimal. The average IGF-IIR staining was significantly greater in HIVE cases as compared to HIV- and HIV+ brains. In HIVE, IGF-IIR upregulation was observed in microglia, multinucleated giant cells, microglial nodules and HIV-infected cells. The function of the receptor in HIV-1 infection is still under investigation. We received support from the City University of New York PSC-CUNY Research Award Program, Einstein CFAR-AI051519, and the National Science Foundation-DUE-0631045 (S-STEMs).

Incidence Of Imposex In The Mud Snail *Ilyanassa obsoleta* From Jamaica Bay, Brooklyn, NY. *Rabia Naqvi and Kristin Polizzotto. Kingsborough Community College, Brooklyn, NY, USA.

Reproductive systems of marine organisms are susceptible to chemical pollution from tributyltin (TBT). This compound is a common component of anti-fouling paint. In the presence of TBT, male mud snails (*Ilyanassa obsoleta*) retain the penis beyond the end of the mating season, and females may develop male characteristics. This condition is known as imposex, and its presence in mud snails has been used as an indicator of high TBT levels. During the summer of 2007, we investigated the incidence of imposex at Kingsborough Community College beach. Since an active marina is nearby, we expected to find a male-skewed sex ratio in the mud snails. However, out of 63 snails dissected, we found 25 male, 22 female, and 16 indeterminate. This suggests that TBT is not present in high levels at this beach.

Analysis Of Surface And Subsurface Levels Of Heavy Metals In Bronx River Water. *Orson Noel, Glen Woodley, Antona Williams and Dereck Skeete, Medgar Evers College, Brooklyn, NY, USA.

The Bronx River was a dumping ground for factories, privies, scrap metals, auto salvage, gas plants, and public and medicinal waste. The South Bronx was heavily industrialized while being a respite for city dwellers. Because of past years of pollution the Bronx River faces serious environmental hazards. We examined water samples from Sheridan Parkway in the vicinity of Hunts Point to determine levels of copper, arsenic, cadmium, lead, nickel and cadmium using a Perkin Elymer AA 8800 Atomic Absorption spectrometer with THGA graphite furnace. Significant levels of copper were found in surface and sub-surface samples as compared to cadmium, noted in minute quantities throughout the sets. A higher concentration of nickel was found in surface samples than sub-surface samples. The aggregate of chromium was quite consistent throughout, with exception of one bottom sample. All results corroborated with results from soil samples taken from the same location of the river. This work was supported by grants 2R25GM06003-05 NIGMS, 0516041071 of NYSDOE, 0622197 of NSF, 0420359 NSF and 67876-0036 of PSC-CUNY.

Transgenic Approaches For Functional Insight Into Plant Acyl-CoA Dependent Acyltransferases. *Maria Norako¹, Xiao-Hong Yu² and Chang-Jun Liu². ¹Kingsborough Community College, Brooklyn, NY and ²Brookhaven National Laboratory, Upton, NY, USA.

This study is focused on three putative acyltransferase genes from *Populus trichocarpa* (poplar tree): *PtHCT1* (Hydroxycinnamoyl-CoA: shikimate/quinic acid hydroxycinnamoyl transferase), its homologue *PtHCT2*, and *PtACT45*. Transgenic approaches were used to monitor the "loss and gain" functions of the individual acyltransferase gene. Each gene was independently cloned into a binary vector pMDC85 chimeric with a green fluorescent protein (GFP) gene and driven by a double 35S promoter. The resultant plasmids were transferred into two strains of *Agrobacterium* (EHA105 and C58C1) and confirmed by Polymerase Chain Reaction (PCR). The transformed strains were used to infect 295 pieces of tobacco leaves using the leaf disc method. The co-incubated leaves were selected on a hygromycin containing medium under the required conditions of light and temperature. Hygromycin resistant callus appeared around the edge of the leaves after 2 or 3 weeks. The rate of callus formation was 92.8% when were used *Agrobacterium* EHA105 and 82.5% when using C58C1 strain. The insertion of *PtHCT1*, *PtHCT2* and *PtACT45* genes were confirmed by performing genomic DNA-PCR and electrophoresis. LC-MS analysis was performed to monitor the enzymatic activity of the transgenic product. As the result, the high activity on the formation of p-coumaroyl shikimate was detected in *PtHCT2*- transgenic tobacco.

The Disruption Of Morphological Response, The Disruption Of Sex Ratios Of *Xenopus laevis* As A Result Of Bisphenol An Exposure. *Thomas Orioles Jr., and M.E. Royston, St. Josephs College, Patchogue, NY.

Bisphenol A, commonly known as BPA, is a chemical belonging to the phthalate family. Phthalates are used to soften vinyl; BPA in particular is a chemical building block used in the production of clear, shatterproof, formable polycarbonate plastics. Later, after heating and scratching of the plastics, these phthalates can leach into our food or drink. Most are known to be endocrine disruptors, capable of interfering with the hormones that regulate masculinity and femininity. Scientist from the Centers for Disease Control and Prevention and several universities found that boys born to mothers with higher phthalate levels are more likely to show altered genital development, linked to incomplete testicular descent. Additional studies found higher phthalates levels led to lower sperm counts. In addition to these occurrences, male alligators located in Florida with sex organs on third to one half normal size. In this experiment sex ratios, morphological processes of the *Xenopus laevis* (African Clawed Frog) with exposure to Bisphenol A is studied.

Lipopolysaccharide (LPS) Stimulation Of Bone-Derived Macrophages To Produce Interleukin-15 Receptor- α Subunit Is Stat3 Independent. *Lisa A. Palmer and Andrew Nyugen, Ph.D. Kingsborough Community College, Brooklyn, NY, USA.

Macrophages are phagocytes that play vital roles in the body defenses against certain bacteria, viruses and other pathogens. Their responses could be both specific and non-specific. In the case of negative gram bacteria which contain an endotoxin called Lipopolysaccharide (LPS) to which macrophages respond to by producing a number of pro-inflammatory cytokines, LPS binds to a lipid binding protein on the surface of the macrophage, which transfers it to CD14/TLR4/MD2 receptors complex which in turn stimulates the signaling cascade in macrophage to secrete the cytokines. Secreted cytokines found outside of the cells recruits other leukocytes to the site of infection. One of the cytokines we are interesting in examining is interleukin-15. We have previously shown that bone-marrow derived macrophages produce an α subunit of IL-15 receptor after LPS stimulation. Since the intracellular molecule known as signal-transducer and activator of transcription 3 (Stat3) has been shown to mediate the expression of a number of pro-inflammatory cytokines and their receptors, we want to investigate whether LPS stimulation of macrophages to produce the α Subunit of interleukin-15 receptors is Stat3 dependent. Bone-marrow derived macrophages do produce IL15R- α after LPS stimulation even in the absence of Stat 3 protein.

Evaluation Of Cranial Suture Complexity. *Marie Pierre Payen¹, George Tremburger, Tak Cheung and Patricia Schneider, Queensborough Community College, Bayside, NY.

Skull sutures typically exhibit a sinuous structure. Quantitative analysis of suture complexity has been used in evolutionary studies of fish, amphibians and mammals. Premature closure of the human coronal suture (craniosynostosis) is caused by mutations at the TWIST locus. The synostosis can be surgically corrected, but the natural course of the disease process is unknown. This project applied fractal analysis to the sutures of 20 dry human skulls. The geometric patterns of the sagittal sutures were digitized and analyzed using the Box Counting tool in NIH ImageJ software. The results showed that the average fractal dimension FD is about 1.3 (N = 20). The standard deviation is about 0.2. Outliers are FD of less than 1 and larger than 1.7. The sensitivity of threshold selection was also studied and suture width correlated with FD. We found that the FD variability is sufficiently large for potential use in clinical monitoring of craniosynostosis in infants.

Heavy Metal Content In Jamaica Bay, NY Sediment.

*Autumn Robbins, Kristin Polizzotto, Ashrain Corbie and Mary T. Ortiz, Kingsborough Community College, Brooklyn, NY.

During the summer of 2007, we studied heavy content in the sediment at three locations in Jamaica Bay, NY: Runway Channel, Sheepshead Bay, and Canarsie Pier. Seven sediment samples were collected, dried, and digested and then tested for aluminum, chromium, manganese, iron, nickel, copper, arsenic, cadmium, mercury, thallium, and lead using atomic absorption spectrometry. Runway Channel and Sheepshead Bay had higher levels of heavy metals than Canarsie Pier except for Al, Hg, Mn, and Tl. Levels of Pb and Cu were much higher in Sheepshead Bay and Runway Channel than at Canarsie Pier. Heavy metal levels in marine sediments are associated with high levels in marine organisms, some of which may be consumed by humans. Therefore, the levels found in this study suggest a significant risk to those who fish for food in Jamaica Bay.

In Vitro And in Vivo Reduction Of Reovirus Infectivity By Pure And Store Purchased Concord Grape Juice (CGJ), Cranberry Juice (CJ), And A Proanthocyanidin Enriched Cranberry Concentrate. *Angelica Sobilo¹, M. Adragno¹, M. Roy², G. Stotzky², A. Burdowski¹ and S. M. Lipson¹, ¹St. Francis College and ²New York University, New York, NY.

Concentrations of 2 to 16% pure CJ reduced reovirus infectivity levels by 75 to 95%, respectively. Similar results were obtained with pure CGJ. Reductions in reoviral titers by pretreatment of MA-104 cell culture monolayers with store purchased CJ or CGJ drinks were similar to that with the pure juices. Vitamin C at concentrations present in a store-purchased CGJ had no adverse effect on viral titers. Supplements in CJ and CGJ drinks do not impact on infectivity titers. A synergistic effect between CJ and CGJ was not observed. PACran^R reduced reovirus infectivity titers by ca. 95% at concentrations <1% (w/v), probably due to increased PAC concentration. Reovirus dsRNA was absent in monolayers pretreated with both juices or in cell-free virus-juice suspensions; these results suggest a blockage of host-cell receptor site(s) and/or a direct inactivation of the virus. Clinical disease was absent in mice 4 days after administration of CJ- or CGJ-reovirus suspensions. Positive controls displayed systemic hemorrhage, diarrhea, dehydration, and death 3-4 days post inoculation. Histology of mouse colon revealed shrunken mucosa, mucin-depleted goblet cells, large inflammatory foci, and debris in lumen of CGJ-virus inoculated mice. Mice treated with CJ-reovirus were normal on autopsy. CJ and, to a lesser extent, CGJ showed, antiviral inhibitory activity in the mouse model.

Functional Significance Of Protein Kinase C α And Hsp90 Interaction In A Yeast Model. *Farrah Solomon¹, Corinne A. Michels², Susan A. Rotenberg² and Nidhi Gadura¹, ¹Queensborough Community College, Bayside, NY and ²Queens College, Flushing, NY, USA.

Hsp90 is a molecular chaperone essential to the folding, activation and maturation of small number of distinct client proteins. It is involved in regulating cell growth and differentiation. Levels of Hsp90 increase in cancer cells, therefore, it is of critical importance to cancer-related phenotypes. Hsp90 client proteins bind to the multi-component Hsp90 chaperone complex. Results from Rotenberg Laboratory show that Hsp90 and PKC α co-immunoprecipitate, suggesting a functional relationship between Hsp90 and PKC α . We used *Saccharomyces* as a model system to explore the possibility that PKC α is an Hsp90 client. Bovine PKC α is expressed in *Saccharomyces* strains carrying defects in the Hsp90/Hsp70 chaperone machinery and its impact on PKC α catalytic function will be determined. The proposed work looked at the expression levels of 3HA-tagged PKC α in wild-type as well as various Hsp90 mutants. PKC α will be partially purified by immunoprecipitation and its kinase activity monitored by an *in vitro* assay using a known PKC α substrate, MARCKS protein. Farrah Solomon is a participant in the NIH Bridges to the Baccalaureate Program at Queensborough Community College (grant 1 R25 GM65096-05).

Effect Of Blocking Agents On Manganese Accumulations In Gill Of *Crassostrea virginica*. *Yamel Perdomo, Margaret A. Carroll and Edward J. Catapane, Medgar Evers College, Brooklyn, NY, USA.

High amounts of manganese are toxic, causing Manganism. Manganism is similar to Parkinsons, both due to disruption in dopamine neurons in brain. P-Aminosalicylic acid (PAS) is being used to alleviate Manganism in humans, but its mechanism of action is unknown. *Crassostrea virginica*, possesses a dopaminergic system innervating the gill. We determined effects of PAS on manganese accumulations. Animals were incubated with 0.5 mM manganese with and without 0.5 mM PAS for 3 days. Manganese levels were measured using atomic absorption spectrophotometry with a graphite furnace. PAS treated animals accumulated less manganese. In other experiments gills were exposed to manganese for 10 hours, then with PAS or EDTA for three days. PAS treatments lower manganese accumulations as compared to controls. EDTA was less effective in reducing manganese accumulations. The study shows the mechanism of action of PAS for alleviating symptoms of Manganism may be due to reducing tissue accumulations of manganese. This work was supported by LSAMP, 2R25GM06003-05 of NIGMS, 0516041071 of NYSDOE, 0622197 of NSF, 0420359 of NSF and 67876-0036 of PSC-CUNY.

Endocrine Disrupting Compounds (EDCs). *Cynthia Pierre¹ and Ebere Nduka², ¹Kingsborough Community College, Brooklyn, NY, USA and ²Medgar Evers College, Brooklyn, NY, USA.

Endocrine disrupting compounds (EDCs) are chemicals affecting the endocrine system of humans and animals. The US Environmental Protection Agency defines EDC as AAn exogenous agent that interferes with the synthesis, secretion, transport, binding, action, or elimination of natural hormones in the body that are responsible for the maintenance of homeostasis, reproduction, development, and behavior (USEPA, 1997,p1). This project looked at effects of exogenous steroids on steroid content of various oyster tissues. Oysters were incubated with different exogenous steroids - testosterone, estradiol, estrone, estriol and progesterone for three days, then various tissues were assayed for levels of progesterone by ELISA. Progesterone in palps was reduced from 100 to 5.49 pg and in gills, 199.4 to 5.27 pg in testosterone treated oysters while there was no significant difference in levels the gonads. Testosterone in tissues of testosterone treated oysters increased significantly. The mechanism by which these tissues handle the exogenous steroids is very little understood and therefore needs to be investigated further. This work was supported by 1R25GM62003 of NIGMS.

MicroRNA's Regulate Normal And Malignant Hematopoiesis. *Andrew Pistilli^{1,2}, Chris Roxbury¹ and Elias Zambidis¹, ¹John Hopkins University, Baltimore, Maryland and ²Wagner College, Staten Island, NY, USA.

MicroRNAs (miRNA) constitute a novel class of small, noncoding RNA's that regulate gene expression at the post-transcriptional level. Mature miRNAs are loaded into an RNA Induced Silencing Complex (RISC). The loaded-RISC then binds to the 3' UTR of target mRNAs according to sequence complementarity and silences expression by degrading target mRNA or interfering with translation. miRNA's regulate many processes including apoptosis, cell cycle control, pattern formation, and differentiation. In this study, the role of miRNA's in hematopoiesis (blood cell formation) was examined. Firstly, a novel construct for the conditional over-expression of mir-155 using a loxP-Cre system was created using molecular biology techniques. The construct is flanked upstream by a β -Geo cassette and a downstream by an eGFP reporter. Transfected K562 cells were characterized using FACS analysis and florescent microscopy. The construct was then transfected into a human embryonic stem cell model that mimics the development of blood cells *in vivo*. In another experiment, the possible involvement of miRNA's in blood cancer was examined using miRNA RT-PCR. The results indicate mir-10a, 10b, 181, 196a, and 196b are over-expressed in RS4:11 leukemic cells. This suggests that microRNA dysregulation may be involved in the molecular pathogenesis of leukemia.

Developing Bluefish (*Pomatomus saltatrix*) AC_n Microsatellite DNA Markers For Population Identification. *Stacy Portnoy¹ and Z.M.G. Sarwar Jahangir², ¹Hunter College, New York, NY and ²Kingsborough Community College, Brooklyn, NY, USA.

Since 1981, bluefish landings declined in US due to overfishing. Management of this migratory fish requires knowledge of its population structure. Currently, its population structure is based mainly on morphology and debated for accuracy. Since population identification using microsatellite DNA has been demonstrated to be highly accurate, this research is designed to identify a bluefish (AC)_n microsatellite DNA marker for population identification. Our findings will be made available for the management of bluefish fishery by the US Marine Fisheries Service. Bluefish samples were collected from Jamaica Bay, nuclear DNA was extracted using a standard protocol. The sample was digested with *NheI* for ligation with dsSNX DNA linkers. The ligated samples will be amplified using PCR, hybridized with 5' biotinylated oligos (AC)_n, separated by streptavidin coated magnetic beads, and followed by (AC)_n microsatellite DNA elution. It will be reamplified by PCR using ssSNA primers for (AC)_n microsatellite DNA enrichment, cloned into pBluescript SK+ phagemid vector, and transferred to *Escherichia coli*. DNA clones will be extracted from *E. coli* using Wizard MiniPreps, and the bluefish DNA fragment will be amplified by PCR. Several such samples will be sent out for sequencing using pBluescript primers and the DNA sequences will be aligned to identify the conserved markers for (AC)_n microsatellite DNA. The presenter and the research project were partially supported by LSAM, KCC Presidents Award and CSTEP.

Cell Culture Model Of Starvation And Refeeding To Study The Regulation Of Mitochondrial Glycerophosphate Acyltransferase. *Dwayne Punnette, Rasheda Shilpi, Prajna Guha and Dipak Haldar, St. John's University, Jamaica, NY.

The effect of starvation and refeeding of rat liver cells on the activity of mitochondrial glycerophosphate acyltransferase (mtGPAT) was investigated. Rat liver cells were cultured and placed in Dulbecco's Modified Eagle's Medium (DMEM) lacking glucose, pyruvate, and fetal bovine serum (FBS) for different periods of time, then placed in media which contained those compounds for additional time. The activity of mtGPAT was then measured. After 2 days of starvation and 1 day of refeeding, there was no change in mtGPAT activity. After 2 days of starvation and 2 days of refeeding, mtGPAT activity increased about 5 fold. The viability of the cells was between 85% and 90%. The results of a Western blot experiment confirmed the presence of a larger amount of mtGPAT protein in the group of cells that was starved for 2 days and refed for 2 days. These results suggest that increased concentrations of either glucose, pyruvate or FBS are directly related to an increase in mtGPAT activity.

Toxicological Studies Of Selected Ionic Liquids Using *Rhizopus stolonifer*. Abigail Richardson¹, Xing Li², James Wishart³, Sharon Lall-Ramnarine² and Catherine McEntee⁴, ¹Brooklyn College, Brooklyn, NY, ²Queensborough Community College, Queens, NY, ³Brookhaven National Laboratory, Upton, NY, and ⁴Kingsborough Community College, NY.

Ionic liquids are newly synthesized organic salts made up of cations and anions, one or both of which is particularly large. Proposed uses for ionic liquids are varied and include alternative organic solvents, stationary phases for gas chromatography, and as electrolytes in batteries. Because ionic liquids (ILs) are non-volatile, they are considered to be solvents for green chemistry. However, while ILs do not pollute the air, they can be released into aquatic environments as well as be introduced into the soil. This study examines the possible toxic effects of ILs of varying carbon chain length and differing purities on *Rhizopus stolonifer*. The ionic liquids tested in this experiment were synthesized from cations such as pyridinium, pyrrolidinium, and imidazolium. Consistent with the literature, we report that ILs with long chains of 8 to 12 carbons, proved to be fungicidal at the highest concentrations tested. Research studies have stated that if the ionic liquid has a carbon chain of more the 12 carbons do not demonstrate a considerable amount of toxicity. We report, however, that while ILs whose alkyl chains are longer than 12 carbons are not fungicidal, they do inhibit growth of the mycelia to a certain percent.

The Electrode-Electrolyte Impedance Spectroscopy Measurements Of Cancer Cell Culture Media And KCL (Potassium Chloride) While Calibrating A System Throughout A Frequency Range. *Clarice Richardson¹, Shekhar Bhansali² and Geetha Vuppala², ¹Medgar Evers College, Brooklyn, NY and ²University of South Florida, Tampa, FL.

System calibration throughout a frequency range and impedance measurements are vital skills. We studied how to calibrate a system to obtain correct readings throughout a frequency range and record impedance of standard KCL and different cell culture media. Two methods used to calibrate were the Open and Short Compensation, and Open, Short and Load Compensation. We used the Multi Micro-Electrode Bio-Sensor at University of South Florida's Electrical and Biomedical Engineering Laboratory and studied the electrode-electrolyte interface of impedance spectroscopy measurements. We built a circuit using and found at lower frequencies the correct value of the load resistor was obtained; however, at high frequencies the results were incorrect. We also used KCL to study the physical aspects of the Biosensor System. The Biosensor is used to measure Electrode-Electrolyte Impedance Spectroscopy of Cancer Cell Culture Media and KCL. Clarice Richards is a participant in the CSTEP and NSF-STEP programs of Medgar Evers College funded by 0516041071 of NYSDOE and 0622197 of NSF.

Manganese Disruption Of Mitochondrial Respiration In The Bivalve *Crassostrea virginica* And Its Protection By p-Aminosalicylic Acid. *Claudette Saddler¹, Kiyva Davis², Edward J. Catapane² and Margaret A. Carroll², ¹Kingsborough Community College, Brooklyn, NY, USA, ²Medgar Evers College, Brooklyn, NY, USA.

Manganese is an essential metal that at excessive levels in brain produces extrapyramidal symptoms called Manganism which is similar to Parkinsons disease. The mechanism of action of manganese is not completely understood but thought due to factors including decreased brain dopamine levels, altered dopamine receptor activity and/or oxidative stress in mitochondria. p-Aminosalicylic acid (PAS) is a drug which is being shown to alleviate symptoms of Manganism. We studied the effects of manganese and PAS on mitochondrial respiration in gill of the bivalve mollusc, *Crassostrea virginica*. *C. virginica* gill is a tissue which is innervated by dopaminergic neurons. Mitochondrial respiration was measured using a YSI Micro-Biological Oxygen Monitor with a micro-batch chamber. Additions of manganese (0.1 - 10 mM) caused dose dependent decreases in mitochondrial O₂ consumption. Adding PAS (0.1, 1 mM) prior to manganese protected the mitochondria. The study demonstrates that manganese does adversely affect mitochondrial respiration and that the protective actions of PAS may in part be due to its ability to shield mitochondria from manganese induced oxidative stress. This work was supported in part by grants 2R25GM06003-05 of the Bridge Program of NIGMS, 0516041071 of NYSDOE, 0622197 of the DUE Program of NSF and 67876-0036 of PSC-CUNY.

Identification Of Toll-like Receptors In Spermatozoa.

*Michael Savarese¹, *Dan Plaska², Dr. Michael Palladino, ¹Monmouth University, West Long Branch, NJ, USA, ²The College of New Jersey, Ewing, NJ, USA.

The ability of an organism to reproduce is one of the most fundamental concepts for the vitality of a species. Challenging the ability to reproduce are bacterial, viral, and yeast infections which can render the male reproductive organs impaired or infertile. Protection of spermatozoa from microbes is a vital function of male reproductive organs such as the epididymis, an organ that is essential for sperm maturation, transport and storage. Toll-like receptors (TLRs) are a group of highly conserved transmembrane proteins that recognize invading microbes and activate innate immune responses. We hypothesize that TLRs are involved in antibacterial responses in male reproductive organs where they recognize and help destroy luminal and circulatory pathogens. Previously we have shown that TLRs are highly expressed in the testis and epididymis. The goal of this research was to determine if rat spermatozoa express TLRs. Reproductive organs were excised from adult, male retired-breeder Sprague-Dawley rats, and testicular and epididymal sperm were prepared for immunoblot and immunofluorescence analysis to detect TLRs. Results showed that TLRs 1-5, 7-9, and 11 are present on sperm. These results suggest that sperm can detect luminal pathogens via TLRs in addition to TLRs located on cell types of the testis and epididymis.

Identification Of Phycocyanin Gene In Cyanobacterium *Synechococcus sp.* IU 625. *Nahid Shahidi, *Sara S. Goma, Bijin J. Vadasserril, Lee H. Lee, Tin-Chun Chu, John J. Gaynor and Quinn C. Vega. Montclair State University, Montclair, NJ, USA.

Cyanobacteria possess a light-harvesting complex to absorb light at different wavelengths. This complex includes some of the most intricate pigments, such as phycoerythrin, photosystems I and II, phycobilisome and phycocyanin. These work together to absorb light at low and high energies as well as to increase the photosynthetic capacity of the organism. The unicellular cyanobacterium *Anacystis nidulans* (AN), also named *Synechococcus sp.* IU 625, is a major causative agent of algal blooms. Phycocyanin is a unique blue pigment in cyanobacteria, making them blue-green in color. The phycocyanin gene can be subdivided into two subunits and has been studied in depth in many cyanobacteria. In this study, the primers have been designed using the data generated from the genomic library of *Synechococcus sp.* IU 625. The designed primers were used to prime AN DNA and obtain PCR products. The PCR products will then be sequenced using an ABI Prism 3700 Genetic Analyzer. The sequences will then be sent to GenBank for BlastN and BlastP sequence similarity searches. Phylogenetic analyses of the sequenced phycocyanin gene will be obtained using the PHYLIP package. We will elucidate sequence identity between *Synechococcus sp.* IU 625, *Synechococcus elongatus* PCC 7942 and other cyanobacteria.

Distribution And Community Structure Of Fish Assemblages In An Urban Estuary. *Meghan Shaw, *Samantha Nealer, John Tiedemann and Ursula Howson, Monmouth University, West Long Branch, NJ, USA.

The Shark River ecosystem is an urban estuary located in Monmouth County, New Jersey. The ecosystem serves as nursery ground for many estuarine-dependent fishes. Shark River is also used heavily by recreational boaters and fishermen. The estuary has become increasingly silted over the past 30 years due to watershed soil erosion. Depth is very shallow throughout most of the estuary, preventing access to some locations at low tide. Dredging has been proposed for Shark River. Although dredging is seen by many environmental groups to be detrimental to an ecosystem, in this case anthropogenic siltation of Shark River may lead to conversion to terrestrial wetland, precipitating a change in ecological function. A pre-dredge baseline assessment of fish community structure was conducted. Subsequent to completion of dredging, a second assessment will be performed to determine effects of dredging on fish community structure. Monthly surveys were conducted July - October 2006. Sampling site locations were based on proposed dredge sites. Abiotic parameters (water temperature, salinity, dissolved oxygen, turbidity, photosynthetically active radiation [PAR]) were measured at each sampling site. Replicate otter trawls were conducted. Fish were identified, measured, and enumerated. Frequency distributions were created to examine temporal and spatial differences in abundance.

The Effect Of MAP Kinase Phosphatase Expression On Proliferation. *Michael Slisz and Dorothy Hutter, Monmouth University, West Long Branch, NJ.

Previous results have indicated that, upon contact inhibition in normal fibroblasts, there are increased levels of MAP kinase phosphatase-1 (MKP-1), MKP-2, and MKP-3 proteins, and a decrease in phosphorylated extracellular signal-regulated kinase (ERK) and p38. Fibrosarcoma cells, which are cancerous cells, do not show contact inhibition, and do not have variations of the levels of active MAP kinases or MKPs. It is not known however if the variations in the levels of MAP kinase and MKPs are a cause or effect of contact inhibition. It is hypothesized that the over-expression of MKPs in normal and cancerous cells will cause a decrease in cell growth. Similarly, it is expected that overexpression of phosphatase-resistant MAP kinases will allow normal fibroblasts to overcome contact inhibition. Altering the levels of MKPs or MAP kinases should show direct effects on growth and signaling in cells. Cells were transfected with a vector to overexpress MKP-1 and western blot analysis was used to confirm the expression of the exogenous protein. MTT assays were used to measure the effect of the transfected constructs on the growth of the cultures, and the over-expression of MKP-1 was found to decrease proliferation.

Expression Levels Of PKC Substrates In Human Breast Cancer Cells. *Guy Surpris¹, Regina Sullivan¹, Thushara Abeyweera² and Susan A. Rotenberg², ¹Queensborough Community College, Bayside, NY and ²Queens College, Flushing, NY, USA.

Protein kinase C is a serine-threonine kinase that exists as a family of 12 isoforms. Numerous studies have linked the PKC isoforms to the maintenance of a malignant phenotype, however the direct substrates and downstream targets of PKC are largely unknown. Specifically, the alpha isoform is reported to be involved in the motility signaling pathways of MDA MB- 231 cells, a metastatic human breast cancer cell line. This study was designed to investigate the expression levels of PKC alpha, PKC substrates and the PKC substrate MARCKS in human breast cancer cell lines. The cell lines were reported to be of varying metastatic potential. Immunoblot analysis and immunohistochemistry revealed differences in expression levels of PKC alpha, PKC substrates and MARCKS. In MDA 468 cells, the expression level of PKC alpha is low, however the expression level of MARCKS was high. These results indicate the role of the PKC isoforms in malignant phenotypes may be cell line specific. Further studies will be directed toward establishing PKC isoform profiles in each cell line and identification of substrates. The results from these studies could be useful when designing cancer drug therapies.

Matrix Dependent Expression Of A 65 kDa Protein Associated With Enhanced tMorigenesis. *Catherine Tolvo. New York College of Osteopathic Medicine, Old Westbury, NY, USA.

Malignant Pleural Mesothelioma (MM) is a lung cancer induced by excessive exposure to asbestos. The #40 and #40L cell lines used in this project were taken from a mouse afflicted with pleural mesothelioma. A previous study indicated that tumors from #40L cells were more aggressive because the cells were less adhesive to the environment and proliferate faster than the #40 cells. A 25% decrease in adhesion was noticed when #40L was grown on laminin coated plates compared to plastic tissue-culture plates. An unknown ~65kDa protein band was also discovered in the #40L cells grown on plastic tissue-culture plates. This investigation explored the effect of seeding cells on various surfaces on the expression of the ~65kDa protein, particularly on laminin because of the known decreased adhesion of #40L cells. Results showed that very few cells of either cell line attach to poly-D-lysine coated plates and that both cell lines attached and grew extremely fast on Matrigel. Neither of these conditions changed the expression level of the ~65kDa protein. Laminin induced the protein of interest to appear in the #40 cells and become more strongly expressed in the #40L cells. These results suggest that laminin is possibly involved in advanced tumorigenesis.

Cytosolic C-Terminal Kinase: A Key Regulator Of Fyn During Oligodendrocyte Myelination. *Tahirah Sylvester-Daniel-Wilson¹, Iva D. Tzvetanova² and Holly Colognato², ¹Medgar Evers College, Brooklyn, NY and ²Stony Brook University, Stony Brook, NY, USA.

Myelination is essential for brain development and function. If myelin production or stability is compromised, neurodegenerative diseases, such as Multiple Sclerosis, may arise. Mechanisms of myelination are not fully understood. It is known a Src family kinase, Fyn, is a necessary regulatory molecule. Fyn is inactivated when cytosolic C-terminal kinase (Csk) is recruited by Csk binding protein (Cbp), which directs Csk to lipid rafts, deactivating Fyn and reducing myelin production. We investigated Fyn regulation and function during myelination by testing whether Csk and its kinase activity are necessary to deactivate Fyn during oligodendrocyte development. DNA constructs were made expressing Csk wild type, myristolated Csk, Kinase dead Csk and Kinase dead-myristolated Csk and control pECFP empty vector. Our results show a successful transfection process, predicting Csk is involved in myelin production. We are working to establish its role in cell proliferation and /or cell maturation. Tahirah Sylvester-Daniel-Wilson is a participant in CSTEP and NSF-STEP of Medgar Evers, funded by 0516041071 of NYSDOE and 0622197 of NSF.

Alternatively Processed Sites In Apoptotic Genes Are Associated With Special G-Quadruplex Motifs. *Viktor Vasilev, Oleg Kikin, Lawrence D'Antonio and Paramjeet Bagga, Ramapo College of New Jersey, NJ, USA.

G-quadruplexes have come into the limelight in recent years, especially because of increasing indication for their diverse roles in key cellular processes, human disease, and as targets for therapy. Although prevalence of G-quadruplexes in the human genome has been established, there is a paucity of systematic studies focusing on the analysis of G-quadruplex motifs near RNA processing sites. Our group has been interested in studying the role of G-quadruplexes in regulation of gene expression at post-transcriptional level. We have adopted a bioinformatics approach to study composition and patterns of G-quadruplexes in pre-mRNA sequences (1). Our computational suite consists of a "QGRS Mapper" program (2) that can analyze genomic nucleotide sequences and the "GRSDB" database (3) for curation and further analysis of the QGRS Mapper generated data. At present, our database contains over three million G-quadruplex motifs mapped to >29,000 eukaryotic genes including that are alternatively processed. The current study is focused on ~800 genes involved in apoptosis. We found prevalence of G-quadruplex elements near splice sites and poly (A) regions. G-quadruplexes were conserved near alternatively processed sites. Our findings suggest that G-quadruplexes play a regulatory role in differential RNA-processing of the apoptotic genes studied in this investigation.

Effects Of 5-HT₇ Agonist AS-19 And Antagonist SB-269970 On Male Long-Evans Rats In A Morris Water Maze. *Yves C. Verdieu¹, Brooke Rodriguez¹, Maurice Anderson¹ and Francisco Villegas², ¹Queensborough Community College, Bayside, NY and ²York College, Jamaica, NY.

Serotonin (5-HT) has been shown to play a critical role in learning, memory, and neurological disorders including: Alzheimer's disease, bipolar disorder, and schizophrenia. Nootropic drugs can be utilized as cognitive enhancers and can potentially be used for the treatment of neurodegenerative disorders. It has been shown that by using an auto-shaping technique, there is consolidation of memory using SB-269970 and AS-19 for the receptor 5-HT₇. Forty rats were randomly divided into six experimental groups. All animals were tested for memory consolidation in a Morris water maze. The maze was filled with opaque water, and divided into four quadrants labeled North, South, East, and West. A Plexiglas escape platform was submerged in the Northwest quadrant. Immediately after each of the water maze trials the animals received either vehicle AS-19 (5 mg/kg, s.c.) or SB-269970 (10 mg/kg, i.p.). Data sheets and the "SMART video tracking" software were used to record the time spent to locate the submerged platform (escape latency). Preliminary data suggests a decrease in the escape latency time for the rats treated with AS-19 as well as SB-269970. The current data supports earlier findings that AS-19 and SB-269970 promote memory consolidation in a spatial navigational memory task. This work was supported by the Bridges to the Baccalaureate Program of NIGMS.

Effect Of Blocking Agents On Cadmium Uptake In Gill Of *Crassostrea virginica*. *Mona Yates, Margaret A. Carroll and Edward J. Catapane, Medgar Evers College, Brooklyn, NY, USA.

Cadmium adversely affects human organs, including kidney, liver and lung by inducing apoptosis or carcinogenesis. Cadmium pollution is widespread in aquatic environments and marine animals accumulate cadmium. Gill of *Crassostrea virginica* is a good tissue to study cadmium accumulations. We studied effects of p-aminosalicylic acid (PAS) and EDTA, two metal blocking agents used to treat metal toxicity, on cadmium accumulations in gill. Gills were incubated for 10 hours with 0.5 mM cadmium, removed from cadmium then incubated with blocking agents for 3 days. Cadmium was measured using atomic absorption spectrophotometry with a graphite furnace. Significant amounts of cadmium accumulated after 10 hours. PAS treatments did not reduce cadmium accumulations nor did low concentrations of EDTA (0.5 - 1 mM). Higher concentrations of EDTA (2 - 4 mM) reduced accumulations. Cadmium accumulations are toxic to animals and it can be valuable to find effective agents that can remove cadmium from tissues and blood. This work was supported by 2R25GM06003-05 of NIGMS, 0516041071 of NYSDOE, 0622197 of NSF, 0420359 of NSF and 67876-0036 of PSC-CUNY.

Incorporation Of Fluorinated Phenylalanine Analogs Into Histone Acetyltransferases. *Anita Yuhua Zhu¹, Natalya Voloshchuk¹, and Jin K. Montclare^{1,2}, ¹Polytechnic University, Brooklyn, NY and ²Downstate Medical Center, Brooklyn, NY, USA.

The introduction of fluorinated amino acids into proteins has been used to design proteins with improved thermal stability and increased resistance to denaturants. Proteins that exhibit increased stability have great potential as medicinal therapeutics. Histone acetyltransferases (HATs) represent a group of proteins that acetylate histone tails using acetyl coenzyme A. Our goal is to explore the effects fluorinated amino acids have on the stability and function of HAT tGcn5. In this study, we have biosynthetically replaced phenylalanines in tGcn5 with a series of fluorinated analogs: *p*-fluorophenylalanine (pFF), *o*-fluorophenylalanine (oFF), and *m*-fluorophenylalanine (mFF). We demonstrate high levels of substitution and will investigate the effects that these fluorinated phenylalanines have on the protease stability and function of tGcn5.

Altered Expression Of Receptor Proteins In Adolescent Alcohol Dependency. *Michelle Zook, Darsi Pitchon and Dennis E. Rhoads, Monmouth University, W. Long Branch NJ, USA.

Specific parallels between humans and rats allow for the latter to be studied as a model for understanding unique effects of ethanol on the adolescent brain. The present study focuses on brain adenosine receptors as a target for alcohol that may be affected differently during chronic alcohol consumption by adolescents and may explain their greater susceptibility to alcohol dependency. To further develop the model, Long-Evans rats were started on an ethanol-containing liquid diet in one of two postnatal (P) age ranges (days): P35-45 (adolescent) and P60-70 (young adult). Alcohol consumption (~16 g ethanol/day/kg body weight) and blood alcohol levels (~300 mg/dl) were comparable between the two age groups. When alcohol consumption was abruptly terminated, withdrawal seizures resulted for >50% of the adolescent rats compared to only 16% of the young adults. A standard forebrain nerve-ending preparation was isolated from rats following specified periods of alcohol consumption and from age-matched controls. Western blotting with specific antibodies against A1 and A2a adenosine receptors has detected both proteins in these preparations. This has provided an approach to compare forebrain adenosine receptor levels between adults and adolescents and to assess other potential differences following chronic alcohol consumption.

The Fall 2007 Conference Member Presentations



Microbial Association With The Exterior Of Certain Spiders. J. Trachman, V. Ovtcharenko, Hostos Community College, Bronx, NY, USA.

Many arthropods including mosquitoes and ticks carry microorganisms. In fact, many serve as vectors of microbial disease, with *Borrelia burgdorferi* and Plasmodium species as examples of etiologic agents of Lyme Disease and malaria, respectively. Curiously, the scientific literature is mostly silent when it comes to spiders and their possible association with microbial agents, whether be in terms of normal flora or in terms of serving as disease vectors. Recently, it was suggested that certain spiders might introduce bacteria of the *Photorehabdus* genus, a newly recognized human pathogen, into bite wounds. Another study claims that the presence of *Clostridium perfringens* in the spider venom of the brown recluse spider exacerbates the spider bite necrosis. They also found several other bacteria such as *Bacillus* species on the brown recluse spider exterior. As part of a pilot study, seven different species of spiders were collected from a rural area in upstate New York. Three of these spiders, *Phidippus*, *Salticus*, and *Sitticus* frequent the air amongst tall grasses. *Pisaurina* alternates between short grass and soil. *Trochosa* is in leaf litter and burrows under rocks and logs. *Pardosa* moves frequently between leaf litter and soil whereas the ant-mimic, *Micaria* sits quietly under leaf litter. These spiders were introduced on to the surfaces of solid bacterial media in order to demonstrate the presence of microbes, if any, on their cuticles. Three of the four spiders associated with leaf litter and soil demonstrated a mixture of Gram positive and Gram negative bacteria including *Bacillus* species. The exact nature of the bacteria depended on the species of spider. We primarily found fungi on the cuticles



Discordant Mitochondrial And Nuclear Data In Phylogeny Reconstruction Of Rare Pacific Northwestern Ranid Frogs. Kirsten J. Monsen and Michael S. Blouin, Montclair State University, Montclair, NJ, USA.

Independent phylogenetic studies among closely related organisms may yield conflicting results, especially if these studies use different molecular markers. During a recent intraspecific study of the rare Cascades frog *Rana cascadae*, we discovered three mtDNA haplotype groups within the species' range. In order to elucidate the phylogenetic relationships among these three groups, we compared sequence data from the mitochondrial ND1 gene and flanking tRNA genes and two single copy nuclear loci from the three *R. cascadae* groups and six other ranid species. We found the surprising result that the mtDNA of the Northern red-legged frog *R. aurora aurora*, is more closely related to the mtDNA of *R. cascadae* than to the mtDNA of its own subspecies (and putative closest relative), *R. aurora draytoni* (California red-legged frog). This result conflicts with several previously published independent studies, including the nuclear data we will report in this presentation. In our presentation, we will report the results of our phylogenetic analyses for both types of molecular markers and discuss two possible explanations for the discordance between mtDNA and nuclear DNA in these ranid species: ancient hybridization and incomplete lineage sorting of mtDNA alleles.



A Preliminary Study Of The Plant Communities At Brookhaven National Laboratory, Long Island, New York. R. Stalter, J. Velovic and A. Jung, St. John's University, Queens, NY, USA.

Brookhaven National Laboratory, composed of 5,500 hectares, is located in Suffolk County, Long Island, New York. The objective of this study was to define and describe the major plant communities at the site. Seven major plant communities were identified here: oak woodland, pine/oak woodland; ruderal (disturbed sites); successional fields; planted pine plantations; ponds, streams and wetlands; and the Gamma Forest, Woodwell's Ce 137 irradiated pine/oak woodland. Ruderal sites and successional fields contain the greatest number of vascular plant species. Two species, *Gaylussacia dumosa* and *Lepedeza angustifolium* are New York State rare plants. A 12' dbh American Chestnut, *Castanea dentata*, thrives on laboratory land.



The Millennium Development Goals As A Tool In Biology Education. B. Davis and M. Flannery, Bergen Community College, Paramus, NJ , USA.

Integrating the Millennium Development Goals (MDG) into biology curricula is an approach to promoting diversity, global learning and civic engagement. At the United Nations Millennium Summit in 2000 world leaders agreed to work together to combat world poverty, hunger, disease, environmental degradation and discrimination against women. The MDG were established with a framework to attain these time bound and measurable goals. At Bergen Community College (BCC) the MDG have been infused into several biology curricula through student projects, co-curricular and service learning activities, and faculty inter-classroom collaborations. A major challenge in teaching undergraduate biology, especially to non majors, is to establish a connection between the subject and the student. The MDG offer an opportunity to address this challenge by providing a platform to launch investigations of global disease and environmental problems with devastating, real life implications. MDG such as reducing child mortality, improving maternal health, combating HIV/AIDS and malaria and other diseases are easily integrated into biology curricula. Specific targets within the MDG were identified as most applicable to the Biological Sciences and semester long projects with co-curricular activities and service learning were developed. The *Effects of the World Water Crisis on Human Health and Disease/World Water Day at Bergen Community College*, *AIDS in Africa* and *World AIDS Awareness Day at Bergen Community College* are the first projects. Our presentation will focus on the MDG projects and their assessments. A MDG resource website for faculty and student research will be presented. Project benefits, future projects, strategies to increase co-curricular and service learning student participation will be discussed. The MDG projects immersed students in global biological issues, provided an opportunity for student civic engagement and increased student faculty interaction. The MDG can be integrated into other Biology curricula when faculty is presented with easily accessible resources.

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Abstract

Electrophoretic patterns of Japanese quail, using agarose gel, yield three hemoglobin bands from pre-hatch to 36 days. One band, HbF, is cathodic, the others anodic. Only the two adult Hb bands appear on day 41 and afterwards. The estimated life span of a red blood cell is 36 days

Introduction

The hemoglobin (Hb) of vertebrate species is not homogenous. The types of Hb present may vary in different stages of development and the life cycle, and the adult may also possess a number of different Hb types¹.

In birds the numbers of Hbs reported varies from three components (hereinafter referred to as bands) in chickens and ducks² to five in adult chickens and three distinct bands in 5-day chicken embryos¹. Two Hb bands were found in each of 20 species of wild birds, and one in the pigeon and penguin².

Preliminary work in this laboratory indicated the presence of three hemoglobin bands in Japanese quail. The purpose of this study was to determine the hemoglobins present in Japanese quail in their late embryonic stage (pre-hatch), and in their post-embryonic stage, to adulthood, and to determine the life span of red blood cells of this species by following the occurrence of fetal hemoglobin and its subsequent disappearance as the quail matures.

Materials and Methods

Two adult quail of more than 150 days old, a male and a female, were obtained from a private source. These were maintained in a cage and fed mash and water ad libitum. The birds mated and the fertilized eggs were incubated at 38.5° C. Blood was obtained from a 17 day old embryo, and from one, seven, 11, 16, 22, 29, 35, 36, 37, 38, 41, 42, 44, 47, 48, 49, 50 day old chicks, and from adults more than 150 days old, all unanaesthetized. On several common dates blood was obtained from more than one chick or one adult bird. Full term chicks were maintained in separate cages and fed and watered daily. Blood (approximately 25 µl) was drawn from the right ulnar artery.

Blood was centrifuged for six minutes at 5,000 rpm) then the red blood cells (rbcs) separated from the plasma. The rbcs were diluted with deionized water (five parts water to one part blood), then frozen to lyse the rbcs.

Protein fractions of the hemolyzed rbcs were resolved using agarose gel electrophoresis (Titan Gel High Resolution Protein System, Cat. No. 3040, Helena

Laboratories, Beaumont, Texas). Electrophoresis was conducted at pH 8.7 for 24 minutes at 250 volts. The patterns were stained with Coomassie Brilliant Blue. Percents of the bands within the pattern's curves were obtained by analysis using an imaging densitometer (Bio-Rad Quantity One Version 4.6.3).

Results

Thirty hemoglobin (Hb) patterns were obtained from embryonic to post-hatched quail 56 days old, and five patterns from quail more than 150 days old.

Quail show three Hb bands up to and including 36 days and at 29 days (Fig. 1 A and B, respectively), followed by a sharp decline in the fetal hemoglobin (HbF) on the 37th day and its absence by the 41st day (Fig. 1C). The decline of HbF was accompanied by an increase in Adult I Hb (Table 1). Two of the three bands were anodic (Fig. 1C and D), the third, the fetal hemoglobin (HbF), cathodic (Fig. 1 A and B, the band to the left of the application point). A single Hb sample from a 17 day-old embryo (pre-hatch) contained 17 percent fetal hemoglobin (cathodic), 54 percent Adult I Hb (the shortest migration from the sample origin), and 29 percent of Adult II Hb.

Five samples of adult Hb yielded an average Hb percent for Adult I and Adult II of 62.5 and 37.5 respectively (Fig. 1 D).

Discussion

The two adult hemoglobin bands observed in this study is the same number as that reported for domestic chickens in other studies using different electrophoretic procedures. However, the percentage of the adult hemoglobin with the lower anodic mobility (Adult I) for Japanese quail comprised 65 percent of the total hemoglobin, compared with 75-80 percent Adult I in the adult chicken³.

The near term (pre-hatch) fetal hemoglobin comprised 17% of the total hemoglobin whereas the Adult I hemoglobin, at this stage, contained 54%. Adult I increased as fetal hemoglobin declined.

In Japanese quail earlier forms of hemoglobin may

Table 1. Densitometry obtained percents of electrophoretic patterns of hemoglobin bands from Japanese quail blood

Day	Number of Observations	Band HbF*	Band Adult I*	Band Adult II*
17 day embryo	1	17.4	54.1	28.5
1	3	16.8	50.2	33.4
7	1	12.7	50.2	37.1
11	2	10.1	54.2	35.5
16	1	10.3	52.4	37.2
22	2	16.3	49.1	34.6
29	1	9.2	53.5	37.3
35	1	10.1	53.2	36.7
36	2	1.2	65.7	33.1
37	1	2.7	61.6	35.7
38	1	2.1	63.3	34.6
41	1	0	66.8	33.2
42	1	0	71.1	28.9
44	3	0	68.6	31.4
47	1	0	65.9	34.1
48	3	0	66.8	33.2
49	1	0	68.4	31.6
50	3	0	68.8	31.2
Adults	5	0	62.6	37.4

* The numbers are averages for multiple observations.

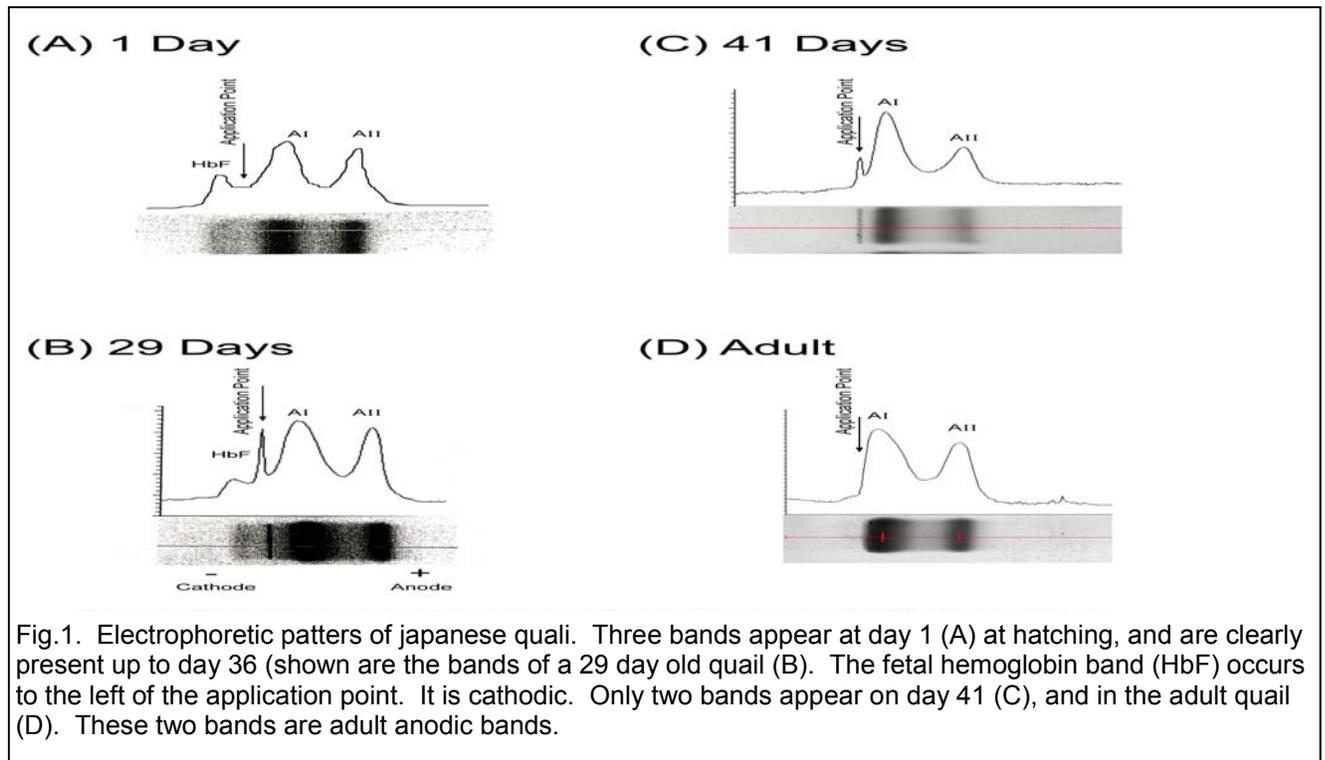


Fig.1. Electrophoretic patterns of Japanese quail. Three bands appear at day 1 (A) at hatching, and are clearly present up to day 36 (shown are the bands of a 29 day old quail (B)). The fetal hemoglobin band (HbF) occurs to the left of the application point. It is cathodic. Only two bands appear on day 41 (C), and in the adult quail (D). These two bands are adult anodic bands.

occur as the chorio-allantois becomes less efficient in providing oxygen as development proceeds, similar to that reported in chickens⁴. Additional forms of hemoglobins that may occur and subsequently disappear prior to the quail HbF observed in this study may follow a similar sequence occurring in other Phasianidae, which include Japanese quail and chickens. For example, in the developing chicken there is a succession of hemopoietic tissues, with the yolk sac yielding to liver and spleen and eventually to bone marrow as the principal definitive site⁵.

Various methods have been used to estimate the average life span of red blood cells. The majority of these methods can be put into two classes: those which tag the cells as they are being formed, and those which attempt to tag proportionately the cells of all ages found in the vascular system⁶. The present study suggests that a less involved method can be used to approximate the life span of red blood cells, at least with avian species.

With the assumption that the production of fetal hemoglobin ceases upon hatching, the longevity of quail red blood cells can be estimated to be approximately 36 days. This life span estimation is similar to that reported for other avian species (chicken, pigeon, and duck) using the aforementioned tagging procedures^{7,8}.

Acknowledgments

Thanks are extended to W. Elliott, Instructional Technology Services, and to the Monmouth University Biology Department for their project support.

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40 Years of MACUB Conferences

by

Pamela J. Carlton

Retired Assistant Professor of Biology from CSI/CUNY

The first female President of MACUB

Original editor of "The Innovator"

MACUB Historian and First Archivist

Welcome speech for the MACUB 40th Anniversary Conference at St. John's University

Welcome and WOW have we come a long way... and I finally got to be a homecoming Queen!

Since, I am an original member of MACUB and was on the Steering Committee in 1966 with Al Donor, Jim Averett, Irv Galinsky and Jeanette Schneiweiss, I can speak as a relic with references!

MACUB started out to meet the needs of local faculty so that they could have a way to exchange ideas with a focus on science education, articulation between two and four year schools (helping to bring the 2 year colleges out of the shadow of the stepchild), and innovative teaching laboratory projects.

MACUB's first conference in 1967 focused on teaching for the major and the non-major biology students, and interactive laboratory experiments using the technology of the time. Our guest speaker was Dr. Hal Murray, colleague of Dr. Postelweit from Purdue University, whose ideas for self paced, tutored laboratories using computer assisted learning in general biology as either primary or supplementary laboratories was far ahead of the curve.

Through the years we have grown to include faculty-student research, scholarship awards for mentors to support their students research (originally named for the late Dr. Joseph Concannon, former Chairperson of Biology at St. John's and long time MACUB treasurer). With the help of all of our vendors, many captured by our current President, Prof. Gary Sarinsky, we now have many scholarships to support student research. Our student poster presentations have grown from the original 10 presenters to over 100 presenters at today's meeting. The original MACUB publication, "The Innovator", has matured into a refereed journal, IN VIVO, thanks to the efforts of Dr. Ed Catapane from Medger Evers College/CUNY.

So here we are and once again the wheel turns and we will go forward re-treading and retooling the tread and the rim. With new workshops on science education, with further supported faculty-student research, with new cutting edge speakers, we will continue to grow. However, neither Gary nor I have made any arrangements for cryogenic recombination...so please, we need your input, we need your leadership! Let us go forward for another 40 years and continue to go from strength to strength.



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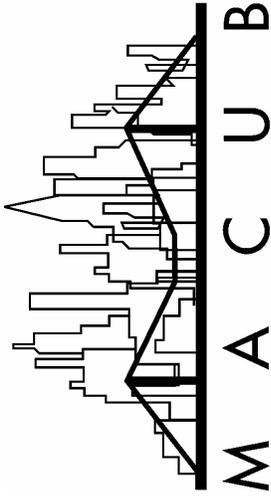
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