

Award Presentations

Announcement of Student Award: **Dr. Paulinus Chigbu, Chair, Faculty Awards Committee**
Professor, Department of Natural Sciences, UMES
Director, CREST/CISCEP
Outstanding Scholar 2010

Graduate Student (Oral Sessions)
Presented by

Mr. Adam Howell
Morgan State University
ETS/CHBGS 2013 Thesis Award Winner
(presenter for 1st, 2nd, 3rd place)

Graduate Students (Poster Sessions)
Presented by

Dr. Maurice Hall, Chair
Department of Communications, Villanova University
(presenter for 1st, 2nd, 3rd place)

Undergraduate Students (Oral Sessions)
Presented by

Dr. Michael Rabel
Department of Physical Therapy, UMES
(presenter for 1st, 2nd, 3rd place)

Undergraduate Students (Poster Sessions)
Presented by

Dr. Maryam Rahimi,
School of Pharmacy and Health Professions, UMES
(presenter for 1st, 2nd, 3rd place)

Graduate Student Winners (Oral Sessions)

First Place

Heather Wolfer

Physiological And Immune System Effects Of Sublethal Hypoxia On Atlantic Croaker, *Micropogonias undulatus*, In Chesapeake Bay

Heather Wolfer* and Andrea Johnson

Department of Natural Sciences, University of Maryland Eastern Shore, Princess Anne, MD 21853

Low dissolved oxygen (DO) is an increasingly common problem during the summer months in the Chesapeake Bay due to both natural and anthropogenic factors. While the lethal effects of hypoxia are easily observed the sublethal but physiologically relevant effects are more obscure. In this study both the physiological and immune system responses of Atlantic croaker to sublethal hypoxia were evaluated in the lab to better understand how organisms react to changes and stressors in their environment. Croaker were subjected to severe hypoxia (2.0 mg/L) for acute (24, 48, and 72h) and chronic (96 and 144h) trials. Blood and tissue samples were collected to assess overall health, reproductive, and immune responses. Comprehensive metabolic adjustment, liver and kidney damage, depressed hematocrit, hyperglycemia, and decreased phagocytic activity were observed in hypoxic fish. Improved information on immune response and croaker hypoxia biomarkers were key results from this project.

Second Place

Melinda Schwartz

School Lunch Project: If They Cook It, They Will Eat

Melinda Schwarz* and Salina Parveen,

Department of Agriculture, Food and Resource Sciences, University of Maryland Eastern Shore, Princess Anne, MD 21853

In an effort to improve child health and reduce childhood obesity, the Healthy, Hunger-Free Kids Act of 2010 mandates that more fruits, vegetables, whole grains, fat-free and low-fat milk be added to the National School Lunch Program. Despite implemented changes, high school students especially do not have to choose these items. Normally, nontraditional vegetables and legumes have low demand in the lunch room. This school lunch project aimed to promote student choice of legumes, and dark green leafy and orange vegetables during school lunch at a high school in Wicomico County on Maryland's Lower Eastern Shore through interactive educational programming that gives students ownership in the school lunch menu. The three week school lunch project was tested as a means to introduce a motivating nutrition experience into the current curriculum including project presentation, justification and parameters, a Food Service kitchen tour, nutrition lessons, group planning, food preparation, and food tasting. Entrée recipes were developed to meet the USDA guidelines with the food available to Food Service, within price constraints, and were required to incorporate at least one of the newly required nontraditional vegetables and legumes. The winning student group worked with food service staff to prepare and serve the new menu item in the cafeteria. Surveys were conducted at mealtime to measure the student's preferences. Classroom test subjects completed surveys throughout the longitudinal semester study. The study was repeated for a total of three semesters. Survey data were analyzed using ANOVA. The Student recipes sold out consistently in the cafeteria with a 75% intention of repurchase. Students chose the healthier items when they are a part of the decision making process. Future studies should investigate quantities of student recipes consumed.

Award Recipients Graduate Students

Graduate Student Winners (Poster Sessions)

First Place

Robert Figliozzi**Thyroid Hormone Treated, Differentiated, Human Neuroendocrine Cells, Exhibit Hormone-Dependent Viral Gene Silencing/Reactivation Similar to HSV-1 Latent Infection****Robert Figliozzi**^{1*}, Matthew Balish², Feng Chen², and Victor Hsia²¹Department of Natural Sciences, ²Department of Pharmaceutical Sciences, University of Maryland Eastern Shore, Princess Anne, MD 21853

HSV-1 infection consists of two stages, acute active lytic infection and lifelong latent infection in sensory neurons. During latent infection, the majority of the viral genes are silenced in neurons, except latency-associated transcript (LAT). The molecular mechanisms of gene silencing and reactivation are still puzzling. We are investigating the host factors/pathways that controlled HSV-1 latency/reactivation and demonstrated that thyroid hormone, T₃, and its nuclear receptor, TR, regulated the expression of LAT, ICP0, and TK in neuroblastoma cell line Neuro-2a and thus controlled viral replication. In this report, we studied the regulatory effects of T₃/TR on HSV-1 gene expression and replication in a neuro-endocrine cell line, LNCaP. Upon androgen deprivation these cells differentiate, exhibit neurite-like morphology, and neuronal physiology. Using this novel model, our microscopy data indicated that these differentiated cells were readily infected and maintained many processes iconic of dendritic morphology. T₃ treated infection experiments showed decreased viral plaque counts compared to untreated cells; T₃ washout restored the plaque counts. QRT-PCR assays showed strong signals for ICP0 in (-)T₃ and T₃ washout condition while the (+)T₃ condition had a greatly reduced signal. Additional experiments using LAT primers revealed stronger signals under (+)T₃ conditions. We are currently performing chromatin immuno-precipitation (ChIP) assays using antibodies for acetylated and methylated histone tails, and TR. These assays are coupled with qPCR for viral gene promoter regions. We expect to see increased repressive transcription marks (methylated histone tails) on viral promoters in the presence of T₃ where TRs bind. We hypothesize that T₃ treated differentiated LNCaP cells display a quiescent infection similar to HSV-1 latency and may be used as a cell culture model for HSV-1 latency studies. We believe that this quiescent infection may be the effect of viral genomic silencing by viral DNA condensation mediated by T₃/TR binding.

Second Place

Evan Lindsay**Exploring fecundity-somatic relationships in the American goosefish, *Lophius americanus*****Evan Lindsay**^{1,*}, Richard McBride², and Andrea Johnson¹¹ Department of Natural Sciences, University of Maryland Eastern Shore, Princess Anne, MD 21853² National Marine Fisheries Service, Northeast Fisheries Science Center, Woods Hole, MA 02543

Fishery managers characterize the reproductive capacity of a fish population as stock reproductive potential (SRP), and use this as a proxy for its resiliency to harvest pressure. Traditionally, SRP has been established using an estimate of spawning stock biomass (SSB), but more recently total egg production (TEP) has gained recognition as more appropriate. A detailed understanding of reproductive strategy, particularly fecundity type, is required for an accurate estimate of TEP. Fecundity, a measure of egg production during a given time frame (i.e. annual fecundity), may vary due to fish demographics, fish condition, and environmental conditions. Such variability imposes uncertainty in the egg production method. Therefore, describing how fecundity varies at the individual level can help reduce uncertainty, ultimately increasing the effectiveness of SRP as a tool for stock assessment. This study explored fecundity-somatic relationships in the American goosefish (*Lophius americanus*), an iteroparous marine teleost that supports a valuable commercial fishery in the northeastern United States. A potential batch fecundity (BF) was characterized using histological examination of gonad tissue and an auto-gravimetric method for enumerating eggs. Fecundity was explored in relation to fish length (total length, TL), weight (guttled weight, GW), condition (K), and age. The results of this study expand knowledge on goosefish reproductive capacity and present information that may be useful for management of this commercially important species.

Award Recipients Undergraduate Students

Undergraduate Student Winners (Oral Sessions)

First Place

Blessing Aroh

The Effect of Nitrogen Treatment on the Anthocyanin and Polyphenol Content of *Aronia melanocarpa* Grown in Maryland**Blessing Aroh**^{1*}, Baruch Volkis¹, Andrew Ristvey², Sudeep Mathew² and Victoria Volkis¹¹Department of Natural Sciences, University of Maryland Eastern Shore, Princess Anne, MD 21853²University of Maryland Extension, Wye Research & Education Center, Queenstown, MD 21658

Black chokeberry or *Aronia melanocarpa* is a small fruit-bearing shrub in the rose family. Although it is native to Maryland, its range in these days are from Newfoundland, west to Ontario, south into Alabama, and east to Georgia, and it is hardy to Zone 3. *Aronia* is a landscape quality plant, susceptible to few pests and diseases that persist in a variety of soils and temperate climatic conditions. It is, therefore, an ideal candidate for organic fruit production. The *Aronia* fruit has nutraceutical qualities, heightening its marketability and sales potential as a value-added product. It is high in anthocyanin content and antioxidant activity and contains more than five times more flavonoids than cranberry. Its antioxidating radical trapping ability is about 40 times higher than that of tomatoes. Due to health-promoting effects, this crop is of particular interest of NASA because of its high antioxidants and nutrition content per weight unit. In space, room is very limited in shuttles and space-crafts. So, for deep space travel to be practical, NASA needs a small and nutritious food source, such as *Aronia*, for the small cabin the astronauts will inhabiting. Some recent studies have implicated the relationship between in-field plant nutrient fertility and antioxidant production in *aronia*. Here we present the data for the antioxidant content of *Aronia melanocarpa* as a function of the difference of age, amount of time spent in the sun or shade, and nitrogen treatment levels of crops. We have shown that the level of nitrogen treatment in the soil influences the antioxidant capacity significantly. Detailed measurements and an analysis of anthocyanin and polyphenols will be presented and discussed. The aim of the project is to determine the treatment that produces the highest capacity of antioxidants in *aronia*.

The project described was supported by the UMES MARC U STAR Program, Award Number T34GM008411, from the National Institute of General Medical Sciences.*

Second Place

Duane Simpson

Biocompatible Polymeric Hooks for *in vivo* Trapping and Determination of Free Radicals**Duane Simpson**^{*}, Yan Waguespack and Victoria Volkis

Department of Natural Sciences, University of Maryland, Eastern Shore, Princess Anne, MD 21853

Free radicals are formed in living tissues under UV irradiation and/or when oxygen biradicals react with biomolecules. Their chief danger results from the damage they inflict when reaction occurs with important cellular components such as DNA, or the cell membrane leading to impaired function or death. It has been shown that free radicals in human blood and tissues can lead to cancer formation. Therefore, the tracking and characterization of free radicals in tissues and biological samples is of relevance and importance. The short-lived life span of free radicals is problematic for their study. Observation relies mostly on indirect methods focused on studying tissues affected by free radicals instead of direct observation and trapping of the radicals. Fullerene, C₆₀, is biocompatible and is a known free radical scavenger. Radical traps are widely used in chemistry for trapping and stabilizing free radicals for further investigation. It was hypothesized that we could chemically link fullerene to a polycyclic ester to trap radicals on the surface on this biocompatible polymer. Here we present methods for the synthesis of biocompatible polymers based on polycyclic esters in which fullerene is chemically linked to the polymeric matrix. Radical trapping occurs on the surface of the biocompatible polymer instead of in physiological fluids allowing for the *in vivo* study of free radicals and their effects. Due to radical trapping properties of fullerenes, the filter prepared from this polymer will be useful for studying free radical content in biological samples and in studying the antioxidant properties of food additives such as lycopene and other carotenoids. To synthesize the biocompatible polymer we used organometallic polymerization of cyclic esters followed by the reaction with amino-substituted fullerenes in which the reaction of carbonyl groups with primary amines links the fullerene to the polymeric matrix. *Supported by NIH T34GM008411*

Award Recipients Undergraduate Students

Undergraduate Student Winners (Poster Sessions)

First Place

Courtney DePass

Contrasting Biogenic Silica Concentrations in the North and South AtlanticCourtney DePass¹, Phoebe J. Lam² and Maureen E. Auro²¹ Department of Natural Sciences, University of Maryland Eastern Shore, Princess Anne, MD, 21853²Department of Marine Chemistry and Geochemistry, Woods Hole Oceanographic Institution, Woods Hole, MA 02543

Diatoms, one of the most important bloom-forming phytoplankton groups in the ocean, depend on silica for growth and formation of their skeletal material. We measured the concentrations of biogenic silica (<51 μ m size fraction collected by in-situ filtration) from the U.S. North Atlantic Geotraces cruise, and the Great Calcite Belt (GCB) cruise in the South Atlantic. Biogenic silica concentrations were estimated using a mild alkaline leach procedure followed by standard spectrophotometric detection. Shallow samples (<1000m) were leached for 1 hr; deep samples (>1000m) were leached in a 3-hr time-series to correct for contributions of lithogenic silica. We analyzed the biogenic silica of <51 μ m suspended particles from the shallow (<1000m) casts of 11 Geotraces stations, and from the deep (>1000m) casts of six of those stations. Samples from all GCB stations analyzed (n=4) were from depths less than 1000m. The results from this study were used to aid in obtaining the full description of particle composition in the North Atlantic (Geotraces) and aid in understanding the role of ballast minerals in controlling the biological pump in the South Atlantic (GCB). The data obtained confirmed that biogenic silica in the North Atlantic in October is extremely low as compared to the South Atlantic. We also tested a weak acid (0.1N HCl) pre-leach of particle samples to test whether the removal of oxyhydroxides prior to the alkaline leach increased its effectiveness, as has been shown for some sediments. We found that the acid pre-leach did not increase the effectiveness of the alkaline leach.

Second Place

Chelsea Grainger

Presence of Vesicular Arbuscular Mycorrhiza on Organic Brandywine Red and Debarao Plum Tomato Roots

Chelsea Grainger*, Fawzy Hashem, Lurline Marsh, Brett Smith, and Luke Lee

Department of Agriculture, Food, and Resource Sciences, University of Maryland Eastern Shore, Princess Anne, MD 21853

The symbiotic relationship between vesicular arbuscular mycorrhiza (VAM) and plant roots is beneficial to plant growth due to increased nutrient uptake, protection of the host roots from pathogens, and increased tolerance to environmental stress such as drought. This study determined the presence of VAM on organic tomato cultivars, Brandywine Red and Debarao Plum, in order to distinguish whether the presence or absence of VAM is related to fruit yield and quality. Brandywine Red and Debarao Plum tomatoes were planted from transplants in late spring 2012. Three soil treatments consisting of combinations of poultry compost and VAM and one control treatment with no additive were applied to the two varieties of tomato crops. Each treatment was replicated four times. Roots from three separate plants in each plot were separated from the plant, washed, and cleared with 10% KOH and 5.6% HCl. They were then stained with 0.05% trypan blue lactoglycerine to visualize the mycelium of the fungi in the roots. Two variations of this technique were attempted yielding inconclusive results at both times. It was decided that in order to accurately determine the presence of VAM on the plant roots, the viability of the VAM used in the inoculation of the tomato plants needed to be determined via culturing. Serial dilutions of the VAM in sterile water were created and grown on potato dextrose agar at 26°C and observed after 3 days. Fungal colonies of different sizes and colors were produced, therefore the VAM was viable. An alternate method of determining the presence of VAM in the roots was then employed. Roots were surface sterilized and placed on potato dextrose agar plates and incubated at 26°C. All samples yielded colonies similar to those that were observed in the VAM cultured for viability, indicating that the VAM was present in the roots of the tomato plants, including those in the control group. In conclusion, more tests are needed to further distinguish the identity of the colonies cultivated in the second experiment as well as the colonies grown out of the roots, and to confirm the presence of VAM on the tomato roots.

Award Presentations

Announcement of Faculty Awards: *Dr. William Talley,*
Assistant Dean, School of Pharmacy and Health Professions, UMES

Faculty (Poster Sessions)
Presented by

Dr. Retia Walker
Special Assistant to the Provost, UMES

FIRST PLACE**Dennis Klima****Fall Risk Screening in the Emergency Department: Development of a Preliminary Tool**

Dennis Klima,¹ Tina Brown Reid,² and Roberta Newton³

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²Department of Nursing, Salisbury University, Salisbury, MD 21801

³Department of Physical Therapy, Temple University, Philadelphia, PA 19140

Older adults often present with a variety of medical conditions related to falls. Emergency Departments (ED), though are rarely screened for fall risk. Fall risk tools for the ED setting are limited. The purpose of the study was to utilize a pilot fall risk screening tool to identify older adults at risk for falls in both the ED and community settings. Forty-two community-dwelling older adults completed the initial pilot and follow-up phases of the Fall Risk Screen in the ED. Upon completion of the initial phase, the screening tool was revised by adding select physical performance tests, including the Timed Up and Go (TUG) Test, Multidirectional Reach and tandem test instruments, and then administered to a second cohort of 103 older adults on-site in the community. Three month follow-up was performed. Statistical analyses included demographic analyses and logistic regression modeling for prediction of falls. Results: Fifteen of the ED patients (35.7%) had two major fall risk factors, including: previous falls, decreased leg strength, and balance and gait problems. On follow-up, three falls occurred in two people. Of the 103 community living subjects (age: 79.3 ± 10.4 years) completing the 3-month follow-up with the revised instrument, 76.7% had one or more major fall risk factors. Select questions and physical performance tests predicted future falls by 70%. TUG Test performance slower than 12 seconds, a Forward Reach excursion > nine inches, and summed semi-tandem/tandem time >20 seconds were independent predictors of falls among the community-living group (p<0.05). The revised Fall Risk Screen is beneficial for identifying older adults at risk for falls and demonstrates both psychometric stability and clinical utility to predict falls among older adults. Our TUG cut-off fall threshold score of 12 seconds is faster than previously reported findings. Interprofessional fall risk interventions and education, including joint nursing and rehabilitation initiatives, are warranted.

Award Recipients Undergraduate Students

Announcement of Faculty Excellence Awards: *Dr. Anthony K. Nyame,
Professor, Department of Natural Sciences, UMES*

**Faculty Awards and Medallions
Presented by**

**Dr. G. Dale Wesson
Vice President for Research and Economic Development, UMES**

Distinguished Scholar Award **Dr. S. Victor Hsia**
Associate Professor, Pharmaceutical Sciences , UMES

Promising Scholar Award **Dr. LaKeisha Harris, CRC**
Assistant Professor, Department of Rehabilitation, UMES

Joseph M. Okoh Award for Excellence
Awarded to **Dr. Arthur L. Allen**
Associate Research Director-1890 Programs, and
Associate Professor, Department of Agriculture, Food
and Resource Sciences, UMES

**Award Recipients
Students**

Committee and Participant Appreciation Awards and Certificates

Presented by

Dr. Ronald Nykiel

Provost and Vice-President for Academic Affairs, UMES

**Poster
Presentations**