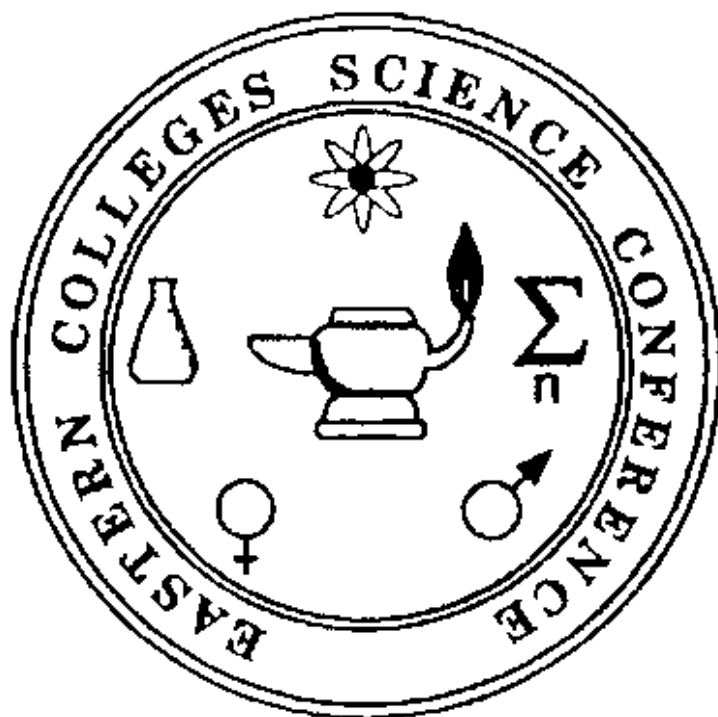


PROCEEDINGS OF THE 55<sup>th</sup> ANNUAL  
EASTERN COLLEGES SCIENCE CONFERENCE



MARCH 30-31<sup>st</sup>, 2001

WILKES UNIVERSITY,  
WILKES BARRE, PA 18766

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## In Memorial

On March 13 of this year, Dr. Walter Faber of the Biology Department of Manhattan College died unexpectedly during a shallow-water dive while participating in a marine biology course trip to the United States Virgin Islands. Dr. Faber was an accomplished diver with almost 400 dives to his credit. Dr. Faber was a dedicated researcher in which he focused his attention on water ecology especially drinking water. He understood the biology and the politics of fresh water sources. He gave of his time and efforts freely to both colleagues and students. He was also a lot of fun. He saw humorous aspects of almost every situation. Faculty and students of Manhattan College will miss him as a close friend.

Greetings and welcome to the 55<sup>th</sup> Annual Eastern Colleges Science Conference. One of the biggest advantages of the ESCS over many of the other student conferences is that it is truly multidisciplinary. Our conference affords you an excellent opportunity to see how scientists in other fields approach the world, design experiments, solve problems, and present their results. Let me encourage you to look through the abstracts and select at least one presentation outside of your discipline to sit in on.

More students this year are presenting posters than are giving platform presentations. Some, uncomfortable with public speaking, feel that posters are an easier medium to work with. I disagree. You could view a platform presentation as a swiftly flowing stream – you are given only a few minutes to carry your audience through the flow of your research. A poster presentation however is placid, like a still pond, allowing the audience to carefully reflect on its content. By this reckoning people who present posters shoulder a greater burden of proof. The debate over which is the better medium remains. Let s start some discussion.

Of course, I am glad you choose to come to this year s Eastern Colleges Science Conference. I know you ll enjoy your experience.

Sincerely,



M. Anthony Kapolka III  
Asst. Prof. of Computer Science,  
Wilkes University

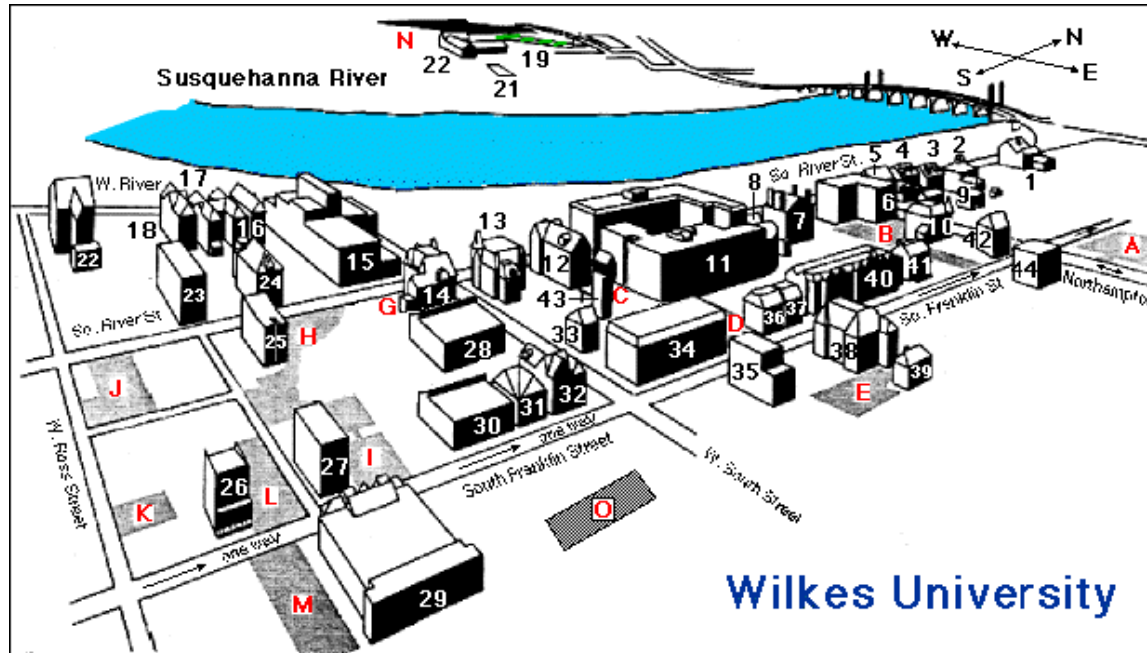
A Special Thanks to the Conference Steering Committee

Lester J. Turoczi,  
Professor and Chair Biology, Chemistry, and Health Sciences

Arthur H. Kibbe,  
Professor and Chair, Pharmaceutical Sciences

Matthew J. Zukoski,  
Assistant Professor of Computer Science

# CONFERENCE LOCATIONS



Key	Site
B	Parking (access from Northampton St.)
29	Arnaud C. Marts Sports & Conference Center
40	Breiseth Hall
11	Stark Learning Center
28	Student Union Building

# CONFERENCE SCHEDULE

Friday, March 30<sup>th</sup>

6:00 - 9:00 PM Registration and Informal Reception  
Ramada Plaza Hotel Lobby

Saturday, March 31<sup>st</sup>

8:00 - 8:50 AM Late Registration and Continental Breakfast  
Stark Learning Center 101

8:30 - 8:50 AM Welcome and Orientation  
Stark Learning Center 101

9:00 - 10:45 AM Platform Presentations

Astronomy, Engineering, and Computer Science	380 Stark Learning Center
Biology	106 Breiseth Hall
Chemistry	166 Stark Learning Center
Psychology	106 Breiseth Hall

11:00 - 11:50 AM Morning Poster Session,  
Jane Breiseth Gallery, Breiseth Hall

11:30 - 1:00 PM Student Brunch  
Dining Hall, Student Union Building

12:00 - 1:00 PM Faculty Buffet Lunch and ECSC Meeting  
Ballroom, Student Union Building

1:00 - 1:50 PM Afternoon Poster Session  
Jane Breiseth Gallery, Breiseth Hall

2:00 - 4:15 PM Platform Presentations

Biology and Health Sciences	106 Breiseth Hall
Molecular Biology, Genetics, and Evolutionary Biology	
Biochemistry	166 Stark Learning Center
Psychology	107 Breiseth Hall
Physics	380 Stark Learning Center

6:30 - 8:00 PM Banquet and Awards Presentation  
Arnaud C. Marts Sports & Conference Center

Keynote Address: Dr. Arthur Kibbe  
Wonder - The Soul of Scientific Discovery

8:30 - 11:00 PM After Conference Anime  
107 Breiseth Hall

ALSO: If you have time, the Sordoni Art Gallery on the first floor of Stark Learning Center is open from 12:00 - 4:30 PM, featuring a wonderful exhibit, Birds in Art.

## PAPERS SUBMITTED FOR REVIEW

### BIOLOGY

Compressive/Tensile Stresses and Lignified Cells as Resistance Components in Joints Between Cladodes of *Opuntia Covillei* and *Opuntia Parryi*.

Jacklyn Pancrudo, College of Mount Saint Vincent

Diversity Of Cell Lengths In Terminal Portions Of Roots: Location Of The Proliferative Cell Population  
Karen Lagrazon. College of Mount Saint Vincent.

The Relationship of Eye Color to Early Graying Hair

Ruth E. Freeburg and Mark Gallo

Department of Biology, Niagara University

### HEALTH SCIENCES

The Effects of Vasopressin on Ethanol Tolerance as Evidence by Circadian Rhythms of Activity and Body Temperature

Kristen A. Yankura, John Carroll University

### PHYSICS

The Simulation of Spacecraft Dynamic Motion for the Development of Spacecraft Autonomous Rendezvous and Capture (ARC) Systems

MIDN Stephen M. Long, USN, Dr. George E. Piper, and Dr.

Bradley E. Bishop, United States Naval Academy

### PHYSIOLOGY

Population and Synthesis of Glycosaminoglycans in Mitral Valve Interstitial Cell Culture

Julie Ann Corcoran, John Carroll University

### PSYCHOLOGY

The Role of Vasopressin in Anxiety-Related Behavior in Rats

Katie Jungers, John Carroll University

## PLATFORM PRESENTATIONS

### MORNING SESSIONS

A	ASTRONOMY, ENGINEERING, and COMPUTER SCIENCE	380 STARK LEARNING CENTER
B	BIOLOGY	106 BREISETH HALL
C	CHEMISTRY	166 STARK LEARNING CENTER
D	PSYCHOLOGY	107 BREISETH HALL

### AFTERNOON SESSIONS

E	BIOLOGY and HEALTH SCIENCES	106 BREISETH HALL
F	MOLECULAR BIOLOGY, GENETICS, and EVOLUTIONARY BIOLOGY	166 STARK LEARNING CENTER
G	BIOCHEMISTRY	166 STARK LEARNING CENTER
H	PSYCHOLOGY	107 BREISETH HALL
I	PHYSICS	380 STARK LEARNING CENTER

# ASTRONOMY, ENGINEERING, and COMPUTER SCIENCE SESSION

380 Stark Learning Center

Session Moderator: Dr. Barbara Bracken,  
Assistant Professor of Computer Science,  
Wilkes University

## Session Schedule:

- 9:00 A1     DETECTING FAINT ASTEROIDS WITH IMAGE PROCESSING  
             Bettina Schimanski and Dan Briotta, Ithaca College
- 9:15 A2     ONLINE 3D TERRAIN VISUALIZATION AND OBJECT TRACKING  
             Milos Barjaktarovic and Dr. Anthony Kapolka, Wilkes University
- 9:30 A3     SIMULATION OF ASTRODYNAMIC MOTION FOR THE DEVELOPMENT OF  
             SPACECRAFT AUTOMATED RENDEZVOUS AND CAPTURE SYSTEM(S)  
             Midshipman 1/c Stephen M Long, USN,  
             Assoc. Prof. George Piper and Asst. Prof. Bradley Bishop  
             United States Naval Academy
- 9:45 A4     REACTIVE CONTROL IN AUTONOMOUS ROBOTS  
             Bernard Graham, III, Dr. Barbara Nostrand, Wilkes University
- 10:00 A5     ENVIRONMENTAL ENGINEERING APPLIED: AQUATIC FILTRATION  
             Kevin Frank and Dr Brian Whitman, Wilkes University



9:00 A1

DETECTING FAINT ASTERIODS WITH IMAGE PROCESSING  
Bettina Schimanski and Dan Briotta, Ithaca College

Detecting faint asteroids and stars in space has been a goal and interest of the Ithaca College Observatory, in order to measure and predict the orbits of asteroids. Asteroids, if not monitored regularly, are in danger of being lost as the error bars in their calculated positions increases with time until in effect the asteroid has been lost. Last summer I developed a stacking program with IGOR, a finite analysis programming language, to significantly improve our observation of asteroids. A series of digital images were taken minutes apart, shifted to line up the same stars in all the images, noise and dust spots subtracted, and lastly the images were combined to produce the final image. This result showed most of the stars in the frame with greater intensity and any asteroids with trails. Consequently the asteroids could be recognized among the stars with less difficulty, and faint stars could be more easily distinguished than in the original images.

9:15 A2

ONLINE 3D TERRAIN VISUALIZATION AND OBJECT TRACKING  
Milos Barjaktarovic and Dr. Anthony Kapolka,  
Wilkes University

We develop 3D software for a tracking system which follows a GPS device providing longitude and latitude data for a particular object. Location data is transmitted through amateur radio to a web server which creates and displays dynamic 3D terrain maps marking the position of the object. Our maps are created by combining GIS DEM files and topographical maps so that users can see the position of the object and the actual situation on the terrain through a web browser.

9:30 A3

SIMULATION OF ASTRODYNAMIC MOTION FOR THE DEVELOPMENT OF SPACECRAFT AUTOMATED RENDEZVOUS AND CAPTURE SYSTEM(S)  
Midshipman 1/c Stephen M Long, USN,  
Assoc. Prof. George Piper and Asst. Prof. Bradley Bishop  
United States Naval Academy

The United States space program has several high-priority missions on the horizon that will require the capability to perform autonomous rendezvous and captures (ARC) with unmanned space vehicles. Consequently, the development and maturation of the technologies associated with ARC systems is drawing a great deal of interest among researchers across the nation. Recognizing the high cost that would result from the repeated development, construction, and testing of these systems in a space environment, it is our goal to investigate the feasibility of using robotic or machine platforms to accurately simulate spacecraft relative motion in a laboratory. A robust platform for the simulation of spacecraft dynamic motion will greatly reduce the costs associated with the implementation and testing of numerous ARC systems on various space vehicles.

9:45 A4

REACTIVE CONTROL IN AUTONOMOUS ROBOTS

Bernard Graham, III, Barbara Nostrand, Ph.D. (advisor)  
Wilkes University

Despite initial hopes with promises of ubiquitous household robots in the near future, robotics has progressed slowly. A major problem facing developers of autonomous robots is robust control system. The problem is not really the construction of the robot itself, the problem is the environment and how the robot senses and interacts with it. You can predict a solution for a static environment, but natural environments are always changing. We have been investigating reactive control as a means for solving this problem.

10:00 A5

ENVIRONMENTAL ENGINEERING APPLIED: AQUATIC FILTRATION

Kevin Frank, Wilkes University

The application of aquatic filtration in the design and construction of garden ponds and aquariums has become increasingly needed and improved. Water-quality is desired to remain constant in an aquarium or garden pond, however this is rarely the case. In real systems, as the fish load is increased, the water quality typically decreases. To improve the poor water quality conditions caused by increased fish loads, aquatic filtration is applied. Three main filtration techniques are commonly used in the garden pond and aquarium industry: Mechanical, Chemical, and Biological. By comparing the functions of these techniques to improve the water quality for a particular reproduced aquatic environment, an aquatic filtration system can be designed.

## BIOLOGY SESSION

106 Breiseth Hall

Session Moderator: Dr. Brian E. Whitman,  
Assistant Professor of Environmental Engineering,  
Wilkes University

- 9:00 B1 COMPRESSIVE/TENSILE STRESSES AND LIGNIFIED CELLS AS RESISTANCE COMPONENTS IN JOINTS BETWEEN CLADODES OF OPUNTIA COVILLEI AND OPUNTIA PARRYI.  
Jacklyn Pancrudo, College of Mount Saint Vincent
- 9:15 B2 EFFECTS OF PCBs ON PHYSIOLOGY AND DNA OF Sphagnum magellanicum AND Lycopersicon esculentum  
Dana L. Felice, Martine Mirrione, Zofia E. Gagnon, Laura Arwood  
Marist College, Poughkeepsie, NY
- 9:30 B3 DEVELOPING A "SMART" APPROACH TO MINE RECLAMATION IN EASTERN PENNSYLVANIA  
Richard Ali, Wilkes University
- 9:45 B4 CHARACTERISTICS OF INTERCALLARY MERISTEMS OF GRASSES. DOES INTERCALLARY MERISTEMS EXHIBIT EXPONENTIAL CELL PROLIFERATION AND GROWTH?  
Rawan Fanek and Shereene Rabadi, Manhattan College
- 10:00 B5 CELL CYCLE CONTROL GENE EXPRESSION IN PEA ROOT MERISTEMS MITOTICALLY ARREST BY DEACETYLASE INHIBITORS  
Mary DiMiceli, James Murphy, Jessica Papile and William A. Tramontano  
Biological Sciences Research Laboratory,  
Manhattan College/College of Mount Saint Vincent,  
Riverdale, NY 10471
- 10:15 B6 THE ROLE OF NITRIC OXIDE IN AMPHIBIAN DEVELOPMENT  
Claire Leonard, L. Mays, C. Brandoni. C. Montes, J. Menon  
William Patterson University

9:00 B1

COMPRESSIVE/TENSILE STRESSES AND LIGNIFIED CELLS AS RESISTANCE COMPONENTS IN JOINTS BETWEEN CLADODES OF OPUNTIA COVILLEI AND OPUNTIA PARRYI.  
Jacklyn Pancrudo. College of Mount Saint Vincent

Cacti are a diverse group of plants with a wide variety of morphologies. Many species have segmented stems in which terminal stem segments may be separated from plants with varying amounts of resistance. Most tissues inside stem segments have thin cell walls and therefore should provide little resistance to joint separation. However, thick-walled, lignified xylem cells should provide the main resistance to joint separation among stem segments. We hypothesized that stem joints of cacti should be analogous to reinforced concrete beams in which the lignified xylem cells should act like steel rods while thin-walled cells should act like concrete. Concrete that is not reinforced cannot withstand tensile forces. For this analogy to be effective in cacti, (1) maximum bending stresses should be linearly related to areas of lignified xylem cell in joints, (2) more lignified xylem cells should be present in tensile joint portions than in other joint portions, and (3) lignified cells should be closer to tensile surfaces than on other surfaces. Data from joints of two cactus species (*Opuntia covillei* and *O. parryi*) support our hypothesis. Specifically, for *O. covillei*, maximum normal stress ( $y$ ) was linearly related to area of lignified xylem cells ( $x$ ) with  $y = 159.14 + 0.79x$  in which  $y$  is expressed in kPa and  $x$  is expressed in  $\text{mm}^2$ . With regard to (2) above, both species showed nearly twice the area of lignified xylem cells in tensile portions compared with compressive portions of joints. Data also show that xylem cells are closer to stem surfaces in tensile sides than in other tissues.

9:15 B2

EFFECTS OF PCBs ON PHYSIOLOGY AND DNA OF  
*Sphagnum magellanicum* AND *Lycopersicon esculentum*  
Dana L. Felice, Martine Mirrione, Zofia E. Gagnon, Laura Arwood  
Marist College, Poughkeepsie, NY

During a 30-year period ending in 1977, an estimated 1.1 million pounds of PCBs were discharged into the Hudson River from two industrial sites. There is a valid concern regarding the effects the PCBs may have on the surrounding terrestrial ecosystem. In a previous study, sediment samples were collected down river from five EPA-designated "hotspots." The analysis showed an average PCB concentration of 50 ppm. Plants grown in these sediments revealed elevated levels of PCBs but not morphological or physiological changes such as growth rate, chlorophyll content, and biomass. In a continuation of that study, *Sphagnum magellanicum*, a native wetland moss, and *Lycopersicon esculentum* (tomato) were grown for 21 days in media with the PCB congener 2,2',4,4',5,5'-hexachlorobiphenyl at concentrations of 0, 1, 10, 100, and 1,000 ppm. As the PCB concentration increased above 100 ppm, the height, biomass, and chlorophyll content of the plants decreased drastically. Currently, we are studying more subtle effects using single cell gel electrophoresis (SCGE), also known as the Comet Assay. This method, which quantitatively measures DNA damage, is performed on plants grown on PCB-contaminated soil and on plant tissue exposed directly to PCBs. In addition, analysis of the plant tissue by gas chromatography will determine the concentration of PCBs accumulated into the plant tissue over the 21-day growth period.

9:30 B3

DEVELOPING A "SMART" APPROACH TO MINE RECLAMATION IN EASTERN PENNSYLVANIA  
Richard Ali, Wilkes University

Strip mining for coal and other minerals results in a stony, drought-prone and infertile substrate. The reclamation of strip-mined lands involves the application of a grass-legume-seed mixture to allow ecological succession. A previous study on two sites, one located in Hanover Township and the other in Newport Townships suggested a lush herbaceous ground cover inhibits tree invasion. This study sought to extend those findings by looking at an additional site, and by assessing soil characteristics. It was hypothesized that intensively reclaimed sites having highly fertile, fine-grained soils and dense herbaceous cover will exhibit less tree invasion than sites having more sterile, coarser soils and low herbaceous cover. The results suggested no significant correlation between the percent herbaceous cover and the number of invading trees. Furthermore, no significant relationship was found between the soil characteristics and the type of invading vegetation. This study is still in progress to identify the mechanism(s) that allow tree invasion on reclaimed sites.

9:45 B4

CHARACTERISTICS OF INTERCALLARY MERISTEMS OF GRASSES.  
DOES INTERCALLARY MERISTEMS EXHIBIT EXPONENTIAL CELL PROLIFERATION AND GROWTH?  
Rawan Fanek and Shereene Rabadi, Manhattan College

Growth in length by grasses is completed by apical meristems and intercalary meristems (IM). Intercalary meristems have been shown to be the main factor in the overall growth of grass stems. In this study, characteristics of IMs from a perennial (bamboo) and an annual grass (reed grass) species were compared. Results of this study show that IMs of reed grass are short-lived, they produce many cells very quickly and these cells have rather thin cell walls. In contrast, IMs of bamboo produce new cells, with very thick cell walls, over a long time period. These differences are coincident with reproductive strategy since reed grasses produce a seed head each year while bamboo plants would only produce one seed head after many, many years. IMs of reed grass did not exhibit an exponential cell age-distribution over the period of study while IMs of bamboo show a distinct exponential cell-age distribution indicating that the IM produces many new cells over a long time period. These two species show very different characteristics from an energy point of view, since bamboo stems produce cells with thick cell walls (requires much energy) so the stem may survive over many years while reed grass stems produce cells with very thin walls (requires much less energy) and each stem only survives for one growing season. The height and growth rates of these stems can be determined from the cell cycle activities of their intercalary meristems.

10:00 B5

CELL CYCLE CONTROL GENE EXPRESSION IN PEA ROOT MERISTEMS MITOTICALLY  
ARREST BY DEACETYLASE INHIBITORS

Mary DiMiceli, James Murphy, Jessica Papile and William A. Tramontano  
Biological Sciences Research Laboratory, Manhattan College/College of Mount  
Saint Vincent, Riverdale, NY 10471

Cultured root meristems of the garden pea, *Pisum sativum* are an excellent system for cell division studies, since cultured roots rapidly uptake a variety of exogenously applied compounds. A 24 hr exposure to the specific deacetylase inhibitors trichostatin A and HC-toxin, or the short-chain fatty acids butyrate and proprionate that may act as deacetylase inhibitors, results in mitotic indices of less than 1% in the meristem. Four cell cycle control genes histone H2A, MAP Kinase, *cyc A2:1* and *cdc2* were expressed in roots treated with either the deacetylase inhibitors or the short-chain fatty acids, yet these genes were not expressed in roots mitotically arrested by carbohydrate deprivation. Via Western analysis, hyperacetylated nuclear proteins were detected in trichostatin A and proprionate treated cells, but not in carbohydrate deprived cells. Current experiments suggest that proprionate treated cells may be undergoing apoptosis, as evidenced by some DNA fragmentation. Different mechanisms probably account for the mitotic inhibition demonstrated in carbohydrate deprived vs. deacetylase inhibitor treated roots.

10:15 B6

THE ROLE OF NITRIC OXIDE IN AMPHIBIAN DEVELOPMENT

Claire Leonard, L. Mays, C. Brandoni. C. Montes, J. Menon  
William Patterson University

The role of nitric oxide (NO), a free radical, as a novel intercellular signal molecule in embryonic development of several organisms has been well documented. In addition, NO has been also shown to be involved in remodeling of the spinal cord and thyroxine induced tail regression in anuran tadpoles. In this study, the distribution of NADPH-diaphorase (NADPH-d) activity was studied in *Xenopus laevis* tadpoles during embryonic and post-embryonic development by the histochemical reaction of NADPH-diaphorase that indicates the presence of nitric oxide synthase (NOS), the enzyme responsible for nitric oxide production. Developmental stages were designated according to Nieuwkoop and Faber, (1967). The highest activity appeared at stage 37/38 and by stage 46/47, NADPH-d activity was widely distributed in brain especially in olfactory lobes, cerebral hemispheres and cerebellum which could be due to development of neuronal connectivities and synaptic plasticity. By the time tadpoles reached stage 52, there was complete lack of NADPH-d activity in the brain. In this study we also show the enhancement of NADPH-d staining in response to retinol and retinol/thyroxine treatment in vitro. At the molecular level, the levels of mRNA for NOS increased significantly in response to these treatments. In conclusion, we propose a role for NO as a hormone-sensitive trigger, beginning the complicated cascade of events that lead to the remodeling of brain and regression of tissues such as tail during amphibian metamorphosis. The presence and distribution of this enzyme in evolutionarily distant animals from mammals adds information about the role of nitric oxide in development.

## CHEMISTRY SESSION

166 Stark Learning Center

Session Moderator: Dr. Arthur Kibbe,  
Professor of Pharmaceutical Sciences,  
Wilkes University

- 9:00 C1 INVESTIGATION OF RING SIZES AVAILABLE BY CHELATION-ASSISTED  
INTRAMOLECULAR HYDROACYLATION  
Elizabeth Dixon, Dr. Holly Bendorf, Lycoming College
- 9:15 C2 SOLID, SOLUTION, AND GAS PHASE STRUCTURAL STUDIES FOR A SERIES OF  
NI(II) AND CU(II) COMPLEXES.  
Midshipman 1/C Amanda L. Kammier, Professor Judith Ann R. Hartman  
Department of Chemistry; United States Naval Academy, Annapolis, MD
- 9:30 C3 SYNTHESIS AND STUDY OF A SERIES OF AMINE FUNCTIONALIZED SILICA GELS  
MADE VIA THE SOL GEL PROCESS  
Midshipman 1/C Joshua Nassiri, Midshipman John Childs,  
Professor Judith Ann R. Hartman  
Department of Chemistry; United States Naval Academy, Annapolis, MD
- 9:45 C4 PREPARATION OF MODIFIED CANTHARIDIN ANALOGUES  
TO TEST FOR ANTICANCER ACTIVITY  
Mary Chlebowski, Thomas Holovics and Dr. Josef G. Krause  
Department of Chemistry, Niagara University, NY 14109
- 10:00 C5 POLAR EFFECT IN THE FREE RADICAL TRANSITION STATE.  
Jeremy Koscielecki, Lucas Tucker, and Dr. Lawrence Menapace.  
Marist College
- 10:15 C6 ESTIMATION OF ARSENIC IN GROUNDWATER IRRIGATED SOIL OF BANGLADESH BY  
ELECTROTHERMAL ATOMIC ABSORPTION SPECTROSCOPY  
Jennifer D'Amato(1) and Mohammad Alauddin(2)\*  
Departments of Biology(1) and Chemistry(2)  
Wagner College, Staten Island, NY 10301  
\*Faculty Advisor

9:00 C1

INVESTIGATION OF RING SIZES AVAILABLE BY CHELATION-ASSISTED  
INTRAMOLECULAR HYDROACYLATION

Elizabeth Dixon, Dr. Holly Bendorf, Lycoming College

Synthesizing medium rings is a challenge to organic chemists because of entropic conditions that hinder ring closure. The synthesis of medium sized rings via simple cyclization reactions results in low yields. Using intramolecular hydroacylation as method of synthesis, 4-pentenals can be converted to cyclopentanones under a rhodium catalyst. However, when this method was used to attempt the cyclization of medium rings it has proven unsuccessful. From this application, chelation-assisted intramolecular hydroacylation is the proposed synthesis developed to cyclize medium rings. A tethering atom, in the middle of an alkene and aldehyde functional group in the same molecule is used to complex to rhodium. Sulfur, the tether atom, helps to form two smaller thermodynamically more favored cyclic system and helps to promote the oxidative addition of the aldehyde. This method of synthesis has been successful in the cyclization of the 4, 3 substrate forming a 7-membered ring. It also shows potential in the cyclization of the 5,3 substrate forming an 8-membered ring.

9:15 C2

SOLID, SOLUTION, AND GAS PHASE STRUCTURAL STUDIES FOR A SERIES OF  
NI(II) AND CU(II) COMPLEXES.

Midshipman 1/C Amanda L. Kammier, Professor Judith Ann R. Hartman  
Department of Chemistry; United States Naval Academy, Annapolis, MD

The Ni(II) and Cu(II) complexes of a series of aminopyridine ligands with denticities ranging from 3 to 7 have been synthesized, and their binding geometries characterized in the gas, solution, and solid phase. Ligands that contain both 5- and 6-member chelate rings were studied to determine the influence of the ligand structure on the coordination geometry of the metal complexes in both the gas and condensed phases.



9:30 C3

SYNTHESIS AND STUDY OF A SERIES OF AMINE FUNCTIONALIZED SILICA GELS  
MADE VIA THE SOL GEL PROCESS

Midshipman 1/C Joshua Nassiri, Midshipman John Childs,  
Professor Judith Ann R. Hartman  
Department of Chemistry; United States Naval Academy, Annapolis, MD

The development of a technology to remove Cu(II) ions from jet fuel is a current goal of the U.S. Navy and Air Force because Cu(II) ions catalyze reactions that cause coking in jet engines. The use of amine functionalized silica gels is currently one of the most promising candidates. This project investigates the direct synthesis of functionalized silica gels via the sol gel process using tetraethoxysilicate and 10% of an alkylamine substituted trialkoxysilicate. Three alkylamines were studied: propylamine, propylethylenediamine, and propyldiethylenetriamine. The sol gel reactions were carried out in the presence of one of three different metal ions to determine if the metal ions serve as templates to orient the geometry of the amine groups to optimize metal ion selectivity.

9:45 C4

PREPARATION OF MODIFIED CANTHARIDIN ANALOGUES TO TEST FOR ANTICANCER ACTIVITY

Mary Chlebowski, Thomas Holovics and Dr. Josef G. Krause  
Department of Chemistry, Niagara University, Niagara University, NY 14109

Cantharidin is a naturally occurring molecule that possesses an oxygen atom at the 7-position of a bicyclo[2.2.1]heptane ring system and a carboxylic acid anhydride moiety. It has been known to have antitumor activity for some time, however, it is also known to be extremely toxic. Our goal has been to synthesize a number of variations on this structure, especially with respect to the oxygen atom and/or the anhydride moiety. All analogues would then be tested for possible anticancer activity.

10:00 C5

POLAR EFFECT IN THE FREE RADICAL TRANSITION STATE.

Jeremy Koscielcki, Lucas Tucker, and Dr. Lawrence Menapace.  
Marist College

The purpose of this research is to determine the nature of the transition state in the organotin hydride reduction of alkyl halides. This is done using substituted benzyl bromides. Current data on the subject suggests that the reaction involves a variable transition state. The exact nature of the transition state may depend on the nature of the substitutions on the benzene ring. Hammett plots of the data are used in order to determine if a linear correlation exists. Linear correlation would suggest that there is a predictable mechanism that the reaction follows. The two distinct linear correlations observed in this research suggest that the reaction involves a variable transition state that has both free radical and polar character.

10:15 C6

ESTIMATION OF ARSENIC IN GROUNDWATER IRRIGATED SOIL OF BANGLADESH BY  
ELECTROTHERMAL ATOMIC ABSORPTION SPECTROSCOPY

Jennifer D'Amato(1) and Mohammad Alauddin(2)\*

Departments of Biology(1) and Chemistry(2)

Wagner College, Staten Island, NY 10301

\*Faculty Advisor

Arsenic is an important environmental contaminant. In Bangladesh, 97% of 120 million population depend on groundwater as a source of drinking water. In some parts of Bangladesh, agricultural land is irrigated with groundwater. In 1993, it was discovered that the groundwater which was once considered to be safe, is contaminated with arsenic, a known cancer causing agent. Arsenic contamination of groundwater in West Bengal(India) and in neighboring country Bangladesh is now considered as the greatest arsenic calamity in the world. While the country is desperately looking for a solution to the scarcity of drinking water, there are other overwhelming issue of possible soil contamination and possible contamination of crops grown in the soil. In the present study we developed a acid digestion method of soil and determination of arsenic at sub-microgram per gram soil by electrothermal atomic absorption spectroscopy. Analytical methodology and our findings on arsenic contamination of soil from Bangladesh will be presented.

## PSYCHOLOGY SESSION

106 Breiseth Hall

Session Moderator: Dr. Rudolph Libeck,  
Psychotherapist,  
Clark Summit State Hospital (retired)

9:00 OPENING REMARKS

- 9:05 D1 CHILDREN'S BELIEFS ABOUT SANTA CLAUS AND OTHER FANTASY CHARACTERS  
Courtney Campbell, Jennifer Tausig, Dan Weiss, Brendan McCorkle,  
Janet Appe, Michelle Moreau, and Josh Reno, Ithaca College
- 9:20 D2 THE EFFECTS OF MEDIA LITERACY TRAINING ON CHILDREN'S UNDERSTANDING  
OF NUTRITIONAL MISINFORMATION ON TELEVISION  
Lauren Parker, Kelly Rosekrans, Jason Carney, Jessica Vinluan,  
and Lisa McNeil, Ithaca College
- 9:35 D3 YOUNG CHILDREN'S REPETITIVE VIEWING OF VIDEOS  
Natalie Hodges, Nick Cadmus, Christian Fisher, Jennifer Ganci,  
Jackie Bernstein, and Heather Carroll, Ithaca College
- 9:50 D4 "YOU'RE A GREAT KID" EFFECTS ON COGNITIVE PERFORMANCE: PEER VS.  
AUTHORITY DIFFERENCES FOR KINDERGARTEN BOYS AND GIRLS  
Michelle Pidluski, Lana Bodach, Jamie Donsbach, Nancy Rader,  
and Research Team 04, Ithaca College
- 10:05 D5 THE EFFECTS OF GENDER AND OCCUPATION ON THE SUCCESS  
OF THE INSANITY DEFENSE  
Heather Porter, Ithaca College
- 10:20 D6 NO TITLE GIVEN  
Shauna McQuillen, Lycoming College
- 10:35 D7 FOOD PREFERENCES IN DIFFERENT SOCIAL SETTINGS  
Jillien Soranno and Laurence J. Nolan, Wagner College

9:05 D1

CHILDREN'S BELIEFS ABOUT SANTA CLAUS AND OTHER FANTASY CHARACTERS

Courtney Campbell, Jennifer Tausig, Dan Weiss, Brendan McCorkle, Janet Appe, Michelle Moreau, and Josh Reno, Ithaca College

To assess children's understanding of the categories "real" and "make-believe" as they apply to actors, characters and cultural fantasy figures, a developmental study was conducted using clinical interviews with children in grades 1-5, along with questionnaires completed by their parents. Children were interviewed individually using pictures of Will Smith, Rosie O'Donnell, Mr. Rogers, Batman, Ronald McDonald, Santa Claus and the Tooth Fairy, with children making judgments about whether each person was real or only make-believe. These judgments were analyzed by age, religion, and birth order of the child, with results indicating that as children get older their concept of "make-believe" becomes clearer while their concept of "real" becomes fuzzier. Beliefs about Santa Claus and the Tooth Fairy changed gradually, usually between the ages of 7 and 9.

9:20 D2

THE EFFECTS OF MEDIA LITERACY TRAINING ON CHILDREN'S UNDERSTANDING OF NUTRITIONAL MISINFORMATION ON TELEVISION

Lauren Parker, Kelly Rosekrans, Jason Carney, Jessica Vinluan, and Lisa McNeil Ithaca College

This study tested the effectiveness of a media literacy unit about nutrition on kindergarten and first-graders' comprehension of cereal and other food commercials. All children viewed a 13 minute videotape containing a cartoon and 12 commercials, and were then questioned individually about 12 different foods concerning how much fruit each contained and whether it should be part of a complete, balanced breakfast. Four conditions were tested, two in which children viewed regular cereal commercials (with half receiving the media lesson before they were questioned, and half afterwards), one in which the "complete breakfast shot" was removed from the cereal commercials, and one in which the voiceover was replaced by one emphasizing that all of the foods shown need to be eaten in order to have a complete, balanced, breakfast. The media literacy training included lessons on the food pyramid, the category of fruit, and learning to analyze the misleading images and phrases used in TV commercials. Results showed that children receiving the media literacy training were significantly more accurate in their nutritional judgments than those in the other 3 conditions.

9:35 D3

YOUNG CHILDREN'S REPETITIVE VIEWING OF VIDEOS

Natalie Hodges, Nick Cadmus, Christian Fisher, Jennifer Ganci, Jackie Bernstein, and Heather Carroll, Ithaca College

This is the second in a series of studies designed to identify the developmental patterns of repetitive viewing of videos (watching the same videotape over and over, often immediately after seeing it the first time). This study reports data from individual interviews conducted with children ages 3-9 following the viewing of a 20 minute videotape of "Fraggle Rock." Children were tested for comprehension of the story, identification of major characters, and overall liking of the program. They were then given the chance to watch part of the video again, with the choices reflecting parts that used humor, complexity, music, or animals. The results are used to begin identifying the reasons why children want to engage in repetitive viewing, and how this changes with age.

9:50 D4

"YOU'RE A GREAT KID" EFFECTS ON COGNITIVE PERFORMANCE: PEER VS. AUTHORITY DIFFERENCES FOR KINDERGARTEN BOYS AND GIRLS

Michelle Pidluski, Lana Bodach, Jamie Donsbach, Nancy Rader, & Research Team 04 Ithaca College

This study is investigating the effect praise has on the subsequent performance of a cognitive task. The praise given is for the child as a person, not praise for task performance. The study is designed to look at the effects of the presence or absence of praise, whether the speaker is an authority or peer figure, and the gender of the child participants. To date, 55 children, aged 5 and 6 years, have been testing, and we anticipate testing another 25. There are four conditions to which children are randomly assigned: Authority Praise, Authority No-Praise, Peer Praise, and Peer No-Praise. The conditions are realized through the use of videotapes that introduce the child to the lab and to the task that follows. The Praise conditions include two additional, brief sentences indicating that the child is "very special" and "a great kid". The sex of the speaker on the videotape is matched to that of the child. The child has fifteen minutes to work on a set of six puzzles, but can stop at any time prior to that. The dependent variable is an efficiency score, defined as the total number of puzzle pieces placed correctly divided by the total time spent working on the puzzles. It is hypothesized that girls will respond best to authority praise and boys to peer praise. This pattern of response is supported by the results we have to date.

10:05 D5

THE EFFECTS OF GENDER AND OCCUPATION ON THE SUCCESS OF THE INSANITY DEFENSE  
Heather Porter, Ithaca College

This study looks at the effects of the gender of the defendant, the occupation of the defendant and the gender of the juror, in the success of a plea of not guilty by reason of insanity. Past research with mock juries has found that women tend to be more lenient towards defendants and the effect of the occupation of the defendant varied based on the seriousness of the crime. The current study seeks to find out if the similarity of the occupation and gender of the defendant to the juror play a role in the success of the insanity defense. The participants in this study, 41 male and 74 female undergraduate students, read a four page murder trial summary, including jury instructions, where the defendant pled not guilty by reason of insanity. The task then was to answer a series of questions about the verdict they would give, sentence recommendations, and factors that influenced the decision, such as a belief of specific testimony and outside influences. The results of this study showed that gender played a major role in not only the verdicts of participants, but also the degree to which they believed defendant's testimony. Occupation of the defendant, although not significant to the verdict, was shown to have an effect on the believability of the defendant. An interaction between defendant gender, participant gender and the perceived degree of planning of the crime was found. Further analysis is still being conducted.

10:20 D6

NO TITLE GIVEN  
Shauna McQuillen, Lycoming College

The relationship between a human male's ethnic origin and the pheromones he produces serving as an attractant to females of like ethnic origins was examined. Participants were 35 female undergraduate students from a small liberal arts school. T-shirts were collected from 10 males who had worn the shirts during light physical activity. Participants were asked to smell the 10 T-shirts and rate their appeal on a 10 point scale and also choose the one that they found to be the most appealing. It was hypothesized that the females would be most attracted to males of the same ethnic origin based on the pheromones that they produced. Implications of the results and ideas for future research were discussed.

10:35 D7

FOOD PREFERENCES IN DIFFERENT SOCIAL SETTINGS  
Jillien Soranno and Laurence J. Nolan, Wagner College

The presence of others during a meal has been shown to consistently increase the meal size of research subjects. This social facilitation is strongest in the presence of friends and family. The current study was conducted to determine whether food selection (meal composition) would vary with the identity of the other diner(s) across 6 meal scenarios read by college student research participants. Sex differences in food selection across these settings were also explored.

# BIOLOGY AND HEALTH SCIENCE AFTERNOON SESSION

106 Breiseth Hall

Session Moderator: Dr Mary McManus,  
Associate Professor of Pharmacuetical Sciences,  
Wilkes University

- 2:00 E1 CORRELATION BETWEEN RESPIRATORY RATE AND GALVANIC SKIN RESPONSE  
CHANGES DURING ELICITATION OF RELAXATION RESPONSE:  
A PHYSIOLOGICAL STUDY  
Susan Spalluto<sup>1</sup>, Georgia Koutsovasilis<sup>2</sup>, ParamPreet Ghuman<sup>1</sup>,  
Nathalie Saint Jean<sup>3</sup>, Michael Rotondo<sup>1</sup>, Zohreh Sahvar<sup>2\*</sup> & Zoltan Fulop<sup>1\*</sup>  
Departments of Biology<sup>1</sup>, Mathematics<sup>2</sup> and Nursing<sup>3</sup>,  
Wagner College, Staten Island NY, 10301 \*Faculty advisor
- 2:15 E2 STUDIES WITH ENRICHMENT ACTIVITIES FOR CAPTIVE ANIMALS  
Roy Keech, Central Connecticut State University
- 2:30 E3 THE ESCAPE RESPONSES OF MUD SNAILS  
Danielle M. Cappelli, Department of Biology,  
Manhattan College/College of Mount Saint Vincent, Riverdale, NY
- 2:45 E4 BEHAVIORAL ASSESSMENT OF A COLONY OF LEOPARD GECKOS  
(EUBLEPHARIS MASCULARUS) TO DETERMINE NORMAL BEHAVIOR AND THE  
POSSIBLE IMPACT OF INCUBATION TEMPERATURE.  
Dennis Quinn, Kristi Lamonica, Cheryl Watson, Ph.D.  
Central Connecticut State University
- 3:00 E5 GUT CONTENT OF THE CTENOPHORE *Mnemiopsis leidyi*  
Daniel B. Novak and John Costello, Providence College
- 3:15 E6 USE OF TOLLUIDINE-BLUE-STAINED SEMITHIN SECTIONS TO  
DIFFERENTIATE GLIAL AND NEURONAL PROFILES IN  
DEVELOPING ZEBRAFISH BRAIN  
John DiClerico<sup>1</sup>, Ren e Sudol<sup>2</sup>, Nneka Onianwah<sup>1</sup>, Cathia Saint Jean<sup>1</sup>  
and Zoltan L. Fulop<sup>1\*</sup> Departments of Biology<sup>1</sup> and Nursing<sup>2</sup>,  
Wagner College, Staten Island, New York 10301, \* Faculty advisor
- 3:30 E7 DIVERSITY OF CELL LENGTHS IN TERMINAL PORTIONS OF ROOTS:  
LOCATION OF THE PROLIFERATIVE CELL POPULATION  
Karen Lagrazon. College of Mount Saint Vincent.
- 3:45 E8 EFFECT OF ADMINISTRATION OF PHYSIOLOGICAL DOSES OF EXOGENOUS  
MELATONIN IN BULLFROG (*RANA CATESBEIANA*) TADPOLES  
Rachael Visconti, Biology Department, Elms College
- 4:00 E9 EXPOSURE OF CULTURED RAT BRAIN ASTROCYTES TO NOREPINEPHRINE  
INCREASES INTRACELLULAR LEVELS OF CYCLIC AMP,  
Deborah A. Nunziato, Department of Biology,  
College of Mt. St. Vincent/Manhattan College, Riverdale, N.Y. 10471

2:00 E1

CORRELATION BETWEEN RESPIRATORY RATE AND GALVANIC SKIN RESPONSE CHANGES DURING ELICITATION OF RELAXATION RESPONSE: A PHYSIOLOGICAL STUDY

Susan Spalluto<sup>1</sup>, Georgia Koutsovasilis<sup>2</sup>, ParamPreet Ghuman<sup>1</sup>, Nathalie Saint Jean<sup>3</sup>, Michael Rotondo<sup>1</sup>, Zohreh Sahvar<sup>2\*</sup> and Zoltan Fulop<sup>1\*</sup>  
Departments of Biology<sup>1</sup>, Mathematics<sup>2</sup> and Nursing<sup>3</sup>,  
Wagner College, Staten Island NY, 10301 \*Faculty advisor

A growing body of evidence has documented that a person's state of mind can enhance or reduce resistance to infections, cancer and other malignancies. The use of certain meditation techniques leading to relaxation has been found to alleviate and reverse some illnesses, hence relaxation is generally accepted as an activity that may have therapeutic value. The physiological response that is elicited with the relaxation technique is referred to as relaxation response. The relaxation response is believed to be associated with physiological changes that may reduce the sympathetic, emergency reaction, fight or flight, and doing this may enhance the regenerative, parasympathetic influences.

The aim of this project was to study the correlation between two physiological parameters, the respiratory rate and the galvanic skin response of subjects during different phases of practicing relaxation. All procedures were performed in accordance with the Institutional Review Board Protocol issued by the Staten Island University Hospital. Each subject signed an Informed Consent.

Acknowledgements: This study was supported by the Mind/Body Institute of Harvard University, Medical School, Boston, MA.

2:15 E2

STUDIES WITH ENRICHMENT ACTIVITIES FOR CAPTIVE ANIMALS

Roy Keech, Central Connecticut State University

Many captive animals exhibit abnormal behavior, such as pacing, head bobbing, refusal to eat, aggressive behavior apparently due to stress, excessive inactivity, etc. Enrichment activities are interventions intended to reduce such abnormal behavior. I performed a series of successful enrichment activities at the Beardsley Zoo, Bridgeport, Connecticut. For example, I introduced fabrics with odors such as catnip and cinnamon to the cage of a pair of ocelots; this intervention substantially increased the activity of the ocelots, who scratched, batted, and rubbed against the scented cloths. I will describe the enrichment activities, the animals' responses, and proposals for additional enrichments.



2:30 E3

THE ESCAPE RESPONSES OF MUD SNAILS

Danielle M. Cappelli, Department of Biology,  
Manhattan College/College of Mount Saint Vincent, Riverdale, NY

Mud snails (*Ilyanasa obsoleta*) are common intertidal marine snails, which co-occur with several potential predators, such as the blue crab (*Callinectes sapidus*) and the green crab (*Carcinus maenas*). I sought to examine how the mud snails alter their behavior in a laboratory experiment. The experimental trials were performed at the College of Mount Saint Vincent in a recirculating seawater system (500L) wet lab. For each experimental trial, paired aquarium tanks were used. One tank housed the predator cue addition (single blue crab, single green crab, and five sacrificed conspecifics) while the other served as a control. Fifty snails were introduced to both tanks and the distribution of snails on the sides of the tanks was assessed at two time periods (.5 & 24hrs). The proportion eaten by blue crabs and green crabs after (24hrs.) was .067 and .028, respectively. The proportion of surviving snails relocated to the sides was analyzed by ANOVA with predator type (blue and green crab, conspecifics (5 dead snails), none) as the main effect. The proportion of snails leaving their initial position did vary by predator cue ( $F_{3,99} = 63.535$ ,  $p < 0.001$ ), although the response to green and blue crabs were indistinguishable. Thus, mud snails appear to recognize the general threat of crab predators, but seem unable to discriminate among the crabs actual predatory skills.

2:45 E4

BEHAVIORAL ASSESSMENT OF A COLONY OF LEOPARD GECKOS (*EUBLEPHARIS MASCULARUS*) TO DETERMINE NORMAL BEHAVIOR AND THE POSSIBLE IMPACT OF INCUBATION TEMPERATURE.

Dennis Quinn, Kristi Lamonica, Cheryl Watson, Ph.D.  
Central Connecticut State University

The sex of leopard geckos is determined by incubation temperature of the eggs. It has been proposed that incubation temperature of females also affects their behavior. However, there has been no in-depth research on behavioral patterns of Leopard gecko in breeding and non-breeding seasons. Previous behavioral research has focused on aggressive behavior in female leopard geckos from different incubation temperatures when exposed to short-term stimuli. These studies were done in short time intervals (several minutes) and without any baseline behavioral comparisons.

Our goal is to describe group behavior of a colony of male and female geckos during breeding and non-breeding seasons. This will be done through nighttime video observations (4-8 hours) and the scoring of female-to-female and male-to-female interactions during breeding and non-breeding seasons. Some of the interactions scored will be tail vibrations, fighting, licking, mounting, and assertion of dominance through chasing. This baseline of normal behavior will be used to compare the behavioral patterns of females incubated at higher temperatures (33; C) to determine if they display more aggressive behaviors than lower temperature females (24; C).

3:00 E5

GUT CONTENT OF THE CTENOPHORE *Mnemiopsis leidyi*  
Daniel B. Novak and John Costello, Providence College

Prey ingested by *Mnemiopsis leidyi* varies with size and morphological development. The variation correlates increasing carbon demand relative to growth and increasing overall carbon consumption with changing consumptive patterns. Less-motile protozoan prey constitute the major observed prey item for the smallest sizes of *M. leidyi* with a regular increase toward the consumption of larger, more-motile prey items relative to increases in predator size. Predatory success on larger prey species increases with the increased encounter radius and increased encounter surface area observed through growth. The processing rate for more non-motile species appears to be consistent throughout size increases, with selectivity relative to larger prey concentrations in situ becoming more pronounced relative to size increases in *M. leidyi*.

3:15 E6

USE OF TOLLUIDINE-BLUE-STAINED SEMITHIN SECTIONS TO DIFFERENTIATE GLIAL AND NEURONAL PROFILES IN DEVELOPING ZEBRAFISH BRAIN

John DiClerico<sup>1</sup>, Ren e Sudol<sup>2</sup>, Nneka Onianwah<sup>1</sup>, Cathia Saint Jean<sup>1</sup>  
and Zoltan L. Fulop<sup>1\*</sup> Departments of Biology<sup>1</sup> and Nursing<sup>2</sup>,  
Wagner College, Staten Island, New York 10301, \* Faculty advisor

The role of glial cells in the developing central nervous system became one of the fundamental questions of vertebrate embryology. For example, glial cell processes are believed to be the guiding substrates for migrating neurons. Glial cells are also involved in myelin formation and assist in neuronal metabolism. However, the differentiation of glioblasts from developing neurons or neuroblasts in histological preparations represents a serious problem if no specific stains, such as immunocytochemistry are involved. One  $\mu\text{m}$  thick, so called semithin sections obtained from plastic embedded tissue samples using a glass knife and an ultratome give a high resolution light microscopic image that is believed to be as detailed as a low magnification electronmicrograph. In this study an attempt was made to use tolluidine-blue-stained semithin sections to differentiate profiles of developing neurons and glial cells during embryogenesis of zebrafish brain.

Acknowledgement: This study was supported by George and Eva Megerle

3:30 E7

DIVERSITY OF CELL LENGTHS IN TERMINAL PORTIONS OF ROOTS:  
LOCATION OF THE PROLIFERATIVE CELL POPULATION  
Karen Lagrazon. College of Mount Saint Vincent.

Cell cycle kinetics is important in the study of animal cancer because changes in cell cycle kinetics can lead to the production of hard tumors. In mammals, however, it is difficult to impossible to conduct experiments on hard tumors of animals. Animal tumors, therefore, are compared to the cell cycle kinetics of plant root meristems. Terminal meristems are responsible for all primary growth in roots. It has been asserted that all cells of root meristems are actively dividing and that the stem cell population expands exponentially. Lengths of cells in roots just proximal to the root cap/initial boundary were used to determine the numbers of cortex and stele cells in the meristem. Meristem cells were defined as cells that did not have significantly different cell lengths from initial cells at the boundary. Data show that for five of the six species (*Allium cepa*, *Pisum sativum*, *Pyrus communis*, *Triticum aestivum*, *Vicia faba*, and *Zea mays*) tested, only the first 15 stele and the first 10 to 35 cortex cells in median longitudinal sections would be in the meristem. For one species, *T. aestivum*, no meristem was found. In addition to the above subject, the distributions of lengths of cells in the root meristems for the six species were compared with a theoretical cell-age distribution for exponentially dividing cells, to determine if actual distributions were similar to the theoretical distribution. For all the species tested, the distribution of cell lengths was not similar to a theoretical cell age distribution. From the data of this study with six plant species, it is concluded that the continuous proliferative cell populations of root meristems are very small and they do not resemble an exponential cell-age distribution.

3:45 E8

EFFECT OF ADMINISTRATION OF PHYSIOLOGICAL DOSES OF EXOGENOUS MELATONIN IN  
BULLFROG (*RANA CATESBEIANA*) TADPOLES  
Rachael Visconti, Biology Department, Elms College

Melatonin (ML) is a hormone secreted by the pineal gland and the retina. Experimental work has shown that it may accelerate or inhibit metamorphosis depending largely on the concentration and mode of administration. Yet ML has a direct inhibitory effect on the thyroid. In many experiments where ML was administered in vivo, microgram (g) quantities of ML were used. Discrepancies in experimental results might arise because high levels of exogenous ML are quickly cleared from the plasma, and have no time to inhibit the thyroid. Consequently, experiments were done to explore whether or not administration of physiological concentrations (pg quantities) of ML would have an effect on plasma T4 in vivo or thyroid secretion in vitro. Immersion of late prometamorphic tadpoles in 150pg/mL of ML for five days increased plasma T4 but did not significantly change the level of plasma ML. However, culture of late prometamorphic tadpole thyroids for two days in 200 pg/mL of ML did not significantly alter T4 secretion. Thus, the findings so far suggest that physiological concentrations of exogenous ML might increase the plasma level of T4 but not through a direct effect on the thyroid. Previous work indicated that ML increases in the tissues upon administration of high levels of exogenous ML. Another experiment was done in which ML was administered and tissues were extracted to see if a physiological dose of ML increases tissue ML. These results will also be presented.

EXPOSURE OF CULTURED RAT BRAIN ASTROCYTES TO NOREPINEPHRINE INCREASES  
INTRACELLULAR LEVELS OF CYCLIC AMP,  
Deborah A. Nunziato, Department of Biology,  
College of Mt. St. Vincent/Manhattan College, Riverdale, N.Y. 10471

Amersham's cyclic AMP assay system, which has high specificity and affinity for cyclic AMP of a highly purified and stabilized binding protein, combines the use of an improved charcoal separation step, resulting in freedom from interference by materials that may be present in crude extracts. Using a linear calibration curve with a detection limit of 0.05 picomoles, cyclic AMP in the range 0.2 to 16 picomoles/incubation tube can be assayed. The kit is based on the competition between unlabelled cAMP and a fixed amount of tritium labeled compound for binding to a protein that has high specificity and affinity for cAMP. Therefore, the amount of labeled protein-cAMP complex formed is inversely related to the amount of unlabeled cAMP in the sample, and measurement of the protein-bound radioactivity allows the amount of unlabeled cAMP to be calculated. The protein bound cAMP was separated from the unbound nucleotide by adsorption of the free nucleotide onto coated charcoal, followed by centrifugation. An aliquot of the supernatant was then removed for liquid scintillation counting, and the concentration of unlabeled cAMP in the sample was determined from a linear standard curve. Exposure of cultured astrocytes to 1 to 10 micromolar norepinephrine showed a dose and time dependent increase of intracellular levels of cyclic AMP within 15 minutes. These results suggest that there are adrenergic receptors on the surface of cultured astrocytes that elicit second messenger systems.

MOLECULAR BIOLOGY, GENETICS  
AND EVOLUTIONARY BIOLOGY SESSION

166 Stark Learning Center

Session Moderator: Dr. Chin Chin Lee,  
Associate Professor of Biology,  
King s College

- 2:00 F1 A HEAT-INDUCIBLE GENE OF DICTYOSTELIUM DISCOIDEUM MAY  
ENCODE A PROTEIN TYROSINE PHOSPHATASE.  
Lindsey Cooper and Brian Skehan,  
Dept. of Biology, Sacred Heart University.
- 2:15 F2 CHARACTERIZATION OF THE CLOSTRIDIUM PERFRINGENS DNAK OPERON  
Matthew Johnson and Theodore Lee  
Biology Department, SUNY Fredonia, Fredonia, NY 14063
- 2:30 F3 THE CHARACTERIZATION OF THE DNAK GENE FROM RHODOBACTER SPHAEROIDES  
Christina Stancato and Theodore Lee  
Biology Department, SUNY Fredonia, Fredonia, NY 14063
- 2:45 F4 ISOLATION AND IDENTIFICATION OF HOMOLOGOUS M. TUBERCULOSIS INVASIN  
GENE IN MYCOBACTERIUM PARATUBERCULOSIS  
Michelle Maxson, Ian Brett, Luis Campodonico and Sheldon Brown  
Department of Chemistry/Biochemistry, Manhattan College,  
Riverdale, NY 10471,  
Bronx Veterans Affairs Medical Center, Bronx, NY 10468
- 3:00 F5 INDUCTION OF APOPTOSIS BY HERPES SIMPLEX VIRUS I IN HEP-2 CELLS  
Renee Baranin, Martine Aubert and John Blaho  
Department of Biology, Manhattan College/College of Mount Saint  
Vincent, Riverdale, NY, Department of Microbiology, Mt. Sinai School  
of Medicine, New York, NY
- 3:15 F6 SEARCHING FOR HOMOLOGS OF THE ASTEROID GENE IN DROSOPHILA  
Jason Flint and Michael Kotarski Department of Biology,  
Niagara University, Niagara, NY 14109

2:00 F1

A HEAT-INDUCIBLE GENE OF DICTYOSTELIUM DISCOIDEUM MAY  
ENCODE A PROTEIN TYROSINE PHOSPHATASE.

Lindsey Cooper and Brian Skehan,  
Dept. of Biology, Sacred Heart University.

The expression of heat shock proteins in all organisms is increased when cells undergo a variety of stressful conditions. Dictyostelium discoideum provides a simple eukaryotic system to characterize the genes encoding these proteins, which provide the cells with tolerance to various environmental stresses. The genes responsible for stress tolerance are highly conserved in all species. Isolation of a cDNA clone, pHS-8A, was obtained through differential screening of a library prepared from heat shocked Dd amoebae using two probes: total cDNA prepared from control cells and total cDNA prepared from heat shocked cells. Preliminary screening revealed that there were several cDNAs that could encode heat-shock proteins. Northern blot analysis using the 8A cDNA as a probe revealed a single hybridizing mRNA species present in low levels in control cells and much higher levels in cells that were heat shocked for three hours. BLAST search of sequences in the Dd genome database revealed identity between 197 base pairs at the 5' end of pHS-8A and Dd genomic Contig 15895 assembled by the Sanger Centre. The relationship between the Contig and pHS-8A was partially confirmed by restriction mapping. Using synthetic primers we are in the process of confirming the sequence through directed sequencing. The longest ORF contained within the Contig encodes a 43 kD protein that shares significant homology with microbial protein tyrosine phosphatases (PTPases). A role for PTPases in cellular stress responses has been described.

2:15 F2

CHARACTERIZATION OF THE CLOSTRIDIUM PERFRINGENS DNAK OPERON

Matthew Johnson and Theodore Lee  
Biology Department, SUNY Fredonia, Fredonia, NY 14063

*Clostridium perfringens* is a pathogen that can cause food poisoning and gas gangrene. *C. perfringens* grows well at elevated temperatures and may become thermal tolerant following exposure to a non-lethal heat shock. The dnaK operon encodes proteins that are involved in organisms' responses to higher temperatures. The *C. perfringens* hrcA, grpE and dnaK genes have been isolated using the polymerase chain reaction (PCR). The hrcA gene encodes a protein that is involved with the regulation of the heat shock response. The grpE and dnaK genes encode proteins that function as molecular chaperones, proteins that assist the folding of other proteins. These genes have been sequenced and research is ongoing to isolate a genomic clone that will contain all the genes present in this operon.

2:30 F3

THE CHARACTERIZATION OF THE DNAK GENE FROM RHODOBACTER SPHAEROIDES

Christina Stancato and Theodore Lee

Biology Department, SUNY Fredonia, Fredonia, NY 14063

The dnaK gene encodes a molecular chaperone that assists in the folding of proteins during translation and following heat shock. This gene has been isolated from the photosynthetic bacterium *Rhodobacter sphaeroides*. The transcription of the gene will be studied by measuring the levels of mRNA transcripts under ambient conditions and following heat shock. The levels of dnaK mRNA will also be compared in the wild type strain and in a rpoH mutant strain. The rpoH gene encodes a sigma factor that is thought to be involved in the regulation of the dnaK gene. The role of dnaK will be further studied by examination of a putative dnaK knockout strain of *R. sphaeroides*.

2:45 F4

ISOLATION AND IDENTIFICATION OF HOMOLOGOUS M. TUBERCULOSIS INVASIN GENE IN MYCOBACTERIUM PARATUBERCULOSIS

Michelle Maxson, Ian Brett, Luis Campodonico and Sheldon Brown

Department of Chemistry/Biochemistry, Manhattan College, Riverdale, NY 10471, Bronx Veterans Affairs Medical Center, Bronx, NY 10468

It has been shown that the ability of *Mycobacterium tuberculosis* to invade host cells, and escape those of the immune system, is mediated by the gene product of the MCE-invasin gene. A similar sequence of DNA, to that of the published section of *M. tuberculosis* MCE gene, has been found in *M. paratuberculosis*, amplified through the use of *M. tuberculosis* MCE primers. This amplicon was cloned and sequenced to reveal over 85% homology to the published sequence. It is likely that this is a section of a similar invasin-like gene. Working with the sequenced *M. paratuberculosis* segment, the elucidation of the whole gene sequence has been attempted, through the formation of genomic libraries, and subsequently the use of a genome walking procedure.

3:00 F5

INDUCTION OF APOPTOSIS BY HERPES SIMPLEX VIRUS 1 IN HEP-2 CELLS

Renee Baranin, Martine Aubert and John Blaho

Department of Biology, Manhattan College/College of Mount Saint Vincent,  
Riverdale, NY, Department of Microbiology, Mt. Sinai School of Medicine, New  
York, NY

Apoptosis (programmed cell death) is a highly regulated process of cell suicide, undergone by human epithelial (Hep-2) cells when they are infected with certain types of Herpes Simplex 1 Viruses. Certain variations of Herpes Simplex 1 Viruses (HSV1) induce apoptosis and then block it. Apoptosis is blocked due to the presence of Early and Leaky-Late Proteins, however the mechanism which HSV1 viruses induce apoptosis is still unclear. Experimentation was performed to test a model of whether or not alpha gene expression is necessary for the induction of apoptosis in Hep-2 (human epithelial cells). When HSV-1 infects a cell it takes over the cell machinery and subsequently induces the translation of three different subdivisions of gene products, the alpha, beta, and gamma proteins.

Through the use of infection, whole cell extraction, spectrophotometry, protein gels and Western Blotting, experiments have shown that the presence of the immediate early(alpha) gene products, ICP4 and ICP27 have a strong correlation to the presence of death factors which are indicative of the occurrence of apoptotic events. The Western Blots reveal no PARP (poly-(ADP- Ribose) polymerase) fragmentation in the lanes that do not have corresponding levels of ICP4 and ICP27 in their parallel blots. Therefore, the production of alpha gene products in Herpes Simplex Virus 1 replication are necessary for the induction of apoptosis in Hep-2 (human epithelial) cells.

Furthermore, it had been originally hypothesized that cells infected by TsB7 virus which encodes for a temperature sensitive capsid protein should not show apoptosis at 39.5°C since this temperature is not conducive to wildtype replication (as is 34°C). When Hep-2 cells were infected by TsB7 virus at 34°C there appears to be wildtype gene product production. However, at the non-permissive temperature of 39.5°C these gene products are not present since entry into the capsid is not able to occur.

3:15 F6

SEARCHING FOR HOMOLOGS OF THE ASTEROID GENE IN DROSOPHILA

Jason Flint and Michael Kotarski Department of Biology, Niagara University,  
Niagara, NY 14109 mmk@niagara.edu

The asteroid gene of *Drosophila melanogaster* encodes a novel protein that is expressed in early embryos and in eye imaginal discs. Mutations of asteroid interact phenotypically with mutations of Star and Egfr, the *Drosophila* epidermal growth factor receptor, suggesting that asteroid functions in the EGFR signaling pathway in the regulation of cell division. Identification of homologs of the asteroid gene in different species would suggest that there is a requirement for asteroid expression to regulate eye development and would support the hypothesis of a common genetic program for eye development and a common ancestry for the compound and the single lens eye. The first step in isolating asteroid homologs is to target species close to *D. melanogaster*. *Drosophila pseudoobscura* genomic libraries were constructed, and screened with a *D. melanogaster* asteroid probe. Positive clones were isolated, and asteroid gene sequences were amplified using PCR. DNA sequence was obtained and the sequences were compared to the asteroid sequence of *D. melanogaster*.



## BIOCHEMISTRY SESSION

166 Stark Learning Center

Session Moderator: Dr. Arthur Kibbe,  
Professor of Pharmaceutical Sciences,  
Wilkes University

3:30 G1 ISOLATION AND CHARACTERIZATION OF THE NOR - PATCHOULENOL PATHWAY  
ENZYMES OF POGOSTEMON PATCHOULI  
Tim Johnson, SUNY College at Fredonia

3:45 G2 EFFORTS TOWARDS THE SYSTHESIS OF (+)-PISATIN AND  
MECHANISM-BASED INHIBITORS OF PISATIN DEMETHYLASE  
Kristy Whitman and Edvard Casillas  
Providence College and Villanova University

3:30 G1

ISOLATION AND CHARACTERIZATION OF THE NOR - PATCHOULENOL PATHWAY ENZYMES  
OF POGOSTEMON PATCHOULI

Tim Johnson, SUNY College at Fredonia

The essential oil of *Pogostemon patchouli* has been used for many purposes, though chiefly for its' fragrance. Patchoulol is the major component of the essential oil, but contributes little to the characteristic odor of patchouli. Nor- patchoulenol, however, is the primary contributor to the odor though it is a minor constituent of the oil. The synthesis of nor- patchoulenol has been accomplished through the usage of a mammalian system linked with chemical synthesis. However, the botanical enzymatic pathway of *Pogostemon patchouli* is not well known. We have separated and identified the constituents of the essential oil through a silica column, thin layer silica chromatography plates (TLC) and gas chromatography to produce intermediates to use for characterization of one or more of the enzymes associated with the nor- patchoulenol pathway.

3:45 G2

EFFORTS TOWARDS THE SYSTHESIS OF (+)-PISATIN AND  
MECHANISM-BASED INHIBITORS OF PISATIN DEMETHYLASE

Kristy Whitman and Edvard Casillas

Providence College and Villanova University

Similar to humans, plants can also experience a stress. It is typical for plants to synthesize chemicals called phytoalexins as a defense mechanism in response to some type of stress. Pisatin is a phytoalexin that is produced by the sweet pea plant (*Pisum sativum*). Pisatin is manufactured in response to an attack by the fungus *Nectria haematococca*. This fungal threat is not entirely inhibited by the pisatin, however, because the fungus possesses a counter-response. It is able to express the enzyme pisatin demethylase, which functions in removing a methyl group from pisatin, which in turn removes its phytoalexin activity.

The most significant portion of this project is to synthesize pisatin. Previously, pisatin has only been synthesized from a preexisting natural product. One feasible route is through a Heck coupling, in which an aryl halide is coupled to some double bond, while retaining the double bond character. In this case, the coupling is between a benzodioxole ring system and a substituted 1-(2H)-benzopyran. Once understood and perfected, the Heck coupling can also be used in the synthesis of certain mechanism based inhibitors, which would be useful in understanding the enzyme pisatin demethylase.

## PSYCHOLOGY SESSION

106 Breiseth Hall

Session Moderator: Dr. Rudolph Libeck,  
Psychotherapist,  
Clark Summit State Hospital (retired)

- 2:00 H1 EFFECT OF VISUAL ACUITY ON STEREO ACUITY  
Todd Harry, Lycoming College
- 2:15 H2 EFFECT OF VISUAL ACUITY ON DEPTH PERCEPTION.  
Cheryl Padden, Dr. Howard C. Berthold.  
Psychology Department, Lycoming College.
- 2:30 H3 ANXIETY EFFECTS ON CALCULATING TIME  
Garrett Boop, Lycoming College
- 2:45 H4 THE EFFECTS OF SEATING POSITION ON ACADEMIC PERFORMANCE  
Jessica DeDay, Lycoming College
- 3:00 H5 ADJUSTING TO COLLEGE: THE RELIATIONSHIP BETWEEN IDENTITY STYLE,  
ALCOHOL USE AND ACADEMIC PERFORMANCE IN FIRST-YEAR COLLEGE STUDENTS –  
A SHORT-TERM LONGITUDINAL STUDY  
Aimee Nicholas, Gail Moore, Nicole Berardo, Andrew McClurg,  
and Dr. Andrea S. White, Psychology Department, Ithaca College
- 3:15 H6 Color Versus Black in Recall of Pictures and Words  
Amanda Messina, Lycoming College
- 3:30 H7 THE TRANSFERENCE OF UNCONSCIOUS LEARNING ON THE PERCEPTION  
OF OPTICAL ILLUSIONS.  
Amanda Grzeskowiak, Lycoming College.

2:00 H1

EFFECT OF VISUAL ACUITY ON STEREO ACUITY

Todd Harry, Lycoming College

The relationship between visual and stereo acuity was examined. Participants were from an experimental psychology class and a sensation and perception class. Only participants with 20/20 for both near and far vision were used. Participants wearing glasses were not allowed to participate. Acuity was determined by devices used in an optometrist's office. Each trial, participants wore glasses of different diopters to manipulate their acuity. Stereo acuity was determined for each trial by using the Randot stereopsis test.

2:15 H2

EFFECT OF VISUAL ACUITY ON DEPTH PERCEPTION.

Cheryl Padden, Dr. Howard C. Berthold.

Psychology Department, Lycoming College.

A study was conducted to determine whether a person's ability to perceive depth at a distance decreases as a person's visual acuity decreases. A Howard-Dohlman apparatus, featuring 2 moveable rods, was placed 20 feet away from each of 25 Lycoming College students. The students detected which of the 2 rods were closer and their results were later matched up with their measured visual acuity.

2:30 H3

ANXIETY EFFECTS ON CALCULATING TIME

Garrett Boop, Lycoming College

The ability to correctly calculate durations of time spent listening was measured as it related to levels of anxiety. Measurements were recorded at ground level with minimal levels of anxiety present and at a significant altitude, creating an environment with high levels of anxiety. The two groups of listeners, one on ground level and the other at a significant altitude were read the same information and spent the same amount of time listening. The time estimations they provided were collected and analyzed to determine the impact anxiety levels have on the participant's ability to effectively perceive time durations.

2:45 H4

THE EFFECTS OF SEATING POSITION ON ACADEMIC PERFORMANCE

Jessica DeDay, Lycoming College

The effects of seating position on academic performance was investigated. It was hypothesized that students sitting in the front row perform at a higher academic rate compared to the students sitting in the back row. Participants included 70 Introductory Psychology students from Lycoming College. After receiving consent from the participants, the professor wrote current grades on a seating chart of the classroom. Each row and seat on the chart was lettered to protect the privacy of the students. Results are discussed in relation to previous studies.

3:00 H5

ADJUSTING TO COLLEGE: THE RELATIONSHIP BETWEEN IDENTITY STYLE,  
ALCOHOL USE AND ACADEMIC PERFORMANCE IN FIRST-YEAR COLLEGE STUDENTS –  
A SHORT-TERM LONGITUDINAL STUDY

Aimee Nicholas, Gail Moore, Nicole Berardo, Andrew McClurg, and Dr. Andrea S.  
White, Psychology Department, Ithaca College

Personal identity development forms the basis of adjustment to college as individuals explore decisions regarding education, careers and interpersonal relationships. According to Berzonsky three identity styles describe how individuals process self-relevant information: diffuse/avoidant, normative and informational. It has been demonstrated that identity style is related to academic autonomy and educational involvement (Berzonsky & Kuk, 2000). Identity development is also related to alcohol use. As part of a larger study designed to better understand identity style and the behavior of college students, we measured identity style, alcohol use and academic adjustment in first-year college students during October and December of their first semester. We examined the hypothesis that alcohol use changed from Time 1 to Time 2. We then explored possible predictors of GPA: alcohol use at Time 1, Time 2, or changes in use from Time 1 to Time 2. Finally, we tested to confirm that identity style is systematically related to both alcohol use and GPA.

3:15 H6

Color Versus Black in Recall of Pictures and Words  
Amanda Messina, Lycoming College

Using signal detection to conduct this experiment, Lycoming College psychology students with normal color vision were presented with stimuli on 5x7 note cards in the form of either colored pictures, black and white pictures, colored words, and black words. After giving a 60 second memorization period, distracter stimuli were intermixed with the initial stimuli. After mixing the initial stimuli with the distraction stimuli, the participants were asked to separate the initial stimuli from the noise. Results indicated differences in hit and false alarm rates as a function of color and stimulus type.

3:30 H7

THE TRANSFERENCE OF UNCONSCIOUS LEARNING ON THE PERCEPTION OF OPTICAL ILLUSIONS.  
Amanda Grzeskowiak, Lycoming College.

The effect of unconscious improvement on one type of illusion and transference to a different type of illusion was studied. Participants were 100 Lycoming College psychology students. Each participant received a packet that contained 20 Horizontal-Vertical practice illusions and 2 Ponzo, Ebbinghaus or Muller-Lyer test illusions. Participants were asked to perform the appropriate adjustment to the illusion or to make the appropriate size judgement. The data were analyzed for improvement between trials on each set of illusion and then for improvement between the two sets of illusions.

# PHYSICS SESSION

380 Stark Learning Center

Session Moderator: Dr. Marlina Slamet,  
Assistant Professor of Physics,  
Sacred Heart University

- 2:00 I1 HIGH ENERGY PHOTO ABSORPTION BY METALS  
Gerald Guzman, Wagner College
- 2:15 I2 EHRANFEST DOG FLEAS AND THE FREE EXPANSION OF GASSES  
Michael Brady and Joan Scheier, Wagner College
- 2:30 I3 THE STATISTICS OF COIN FLIPPING  
Angelica Iannone and Joan Scheier, Wagner College
- 2:45 I4 A COMPUTER CONTROLLED PULSE HEIGHT ANALYZER  
Travis Fullem, Ithaca College
- 3:00 I5 SELF-STABILIZING FORCES ON A AIRTRACK GLIDER  
Sindia Sosdian and Louis Kijewski, Monmouth University
- 3:15 I6 NUMERICAL SIMULATION OF FREE CONVECTION  
Peter Herbst and Dr. Gregory J. Falabella  
Wagner College
- 3:30 I7 GASES AND THERMOSTATISTICS  
Steven R. Corn, Randy Shanfeld and Dr. Gregory J. Falabella  
Wagner College

2:00 I1

HIGH ENERGY PHOTO ABSORPTION BY METALS  
Gerald Guzman, Wagner College

Using a gamma ray source a study was performed on photon absorption by aluminum and lead. Models and mechanisms for photon absorption will be presented.

2:15 I2

EHRANFEST DOG FLEAS AND THE FREE EXPANSION OF GASSES  
Michael Brady and Joan Scheier, Wagner College

This paper presents a Monte Carlo method that simulates the Ehranfest Dog Flea equilibrium problem using a deterministic and stochastic model. Free expansion of gasses are also considered.

2:30 I3

THE STATISTICS OF COIN FLIPPING  
Angelica Iannone and Joan Scheier, Wagner College

We will present a Monte Carlo simulation of coin flipping. In addition to measuring the variation in the number of heads and tails obtained, runs of heads and tails are analyzed.

2:45 I4

A COMPUTER CONTROLLED PULSE HEIGHT ANALYZER  
Travis Fullem, Ithaca College

A computer-based pulse height analyzer has been developed. The instrument uses simple circuitry to interface commercially available gamma-ray detection equipment to a computer. The circuitry communicates with the computer using either a high-speed data acquisition board, or the Universal Serial Bus. The computer displays a graph of the data and updates the graph as data is collected.

3:00 I5

SELF-STABILIZING FORCES ON A AIRTRACK GLIDER

Sindia Sosdian and Louis Kijewski, Monmouth University

A study is made of the forces underneath a glider on an airtrack when the two gliders collide. At the moment of collision one of the gliders tilts up in the back if the point of contact is not along the mutual center of gravity of the two gliders. Ideal fluid dynamic equations are set up for the air under the glider that tilts. Simplification occurs when the velocity is written as a gradient of a velocity potential. A grid, representing discrete points in the fluid, is developed for the air layer under the glider. The derivatives in the fluid dynamic equations are approximated by finite differences in the first order. This leads to a system of linear equations in the velocity potential at various grid points that are solved by using Mathcad. The velocity potential is then plotted as a surface plot. The derivatives are calculated by subtracting the values of potentials of two neighboring points to give the velocity component. From this the velocity vector field plot is generated. Lastly, the Bernoulli principle is used to obtain the pressure along the bottom of the glider. From this the amount of correcting torque is obtained.

3:15 I6

NUMERICAL SIMULATION OF FREE CONVECTION

Peter Herbst and Dr. Gregory J. Falabella  
Wagner College

Convection is the transfer of heat energy by the bulk motion of a fluid. If this flow is generated by thermally induced density variations it is known as natural or free convection. It is tempting to overlook such flows because the velocities and heat transfer rates associated with them are small. This, however, is a mistake. The design of many systems is often influenced by natural convection. More importantly, buoyant flows are the driving force behind many significant environmental processes and are especially of interest when considering the impact of thermal energy discharge by chimneys and cooling towers. The current research effort is a numerical investigation of the effect of immersing a heated vertical plate into a quiescent fluid. The two-dimensional Navier-Stokes equations are solved using finite-differences. Boundary layer and Boussinesq approximations are made use of to maintain a reasonable computational effort.

3:30 I7

GASES AND THERMOSTATISTICS

Steven R. Corn, Randye Shanfeld and Dr. Gregory J. Falabella  
Wagner College

Physical systems are often analyzed from a large-scale or macroscopic point of view. The substances of which they are comprised are assumed to be continuous and governed by gross or average effects. This is done to keep problems tractible from a computational point of view. In reality, the behavior of the individual molecules determines the observed properties and the concept of a continuum has limitations. This research effort is an investigation into the actions of the individual molecules of a gas. Emphasis is on the validity of the kinetic molecular theory of gases and the associated Maxwell-Boltzmann distribution.



## MORNING POSTER SESSION

11:00-11:50 Jane Breiseth Gallery, Breiseth Hall

### BIOLOGY POSTER ABSTRACTS

- M1** ANTIBIOTIC RESISTANCE AMONG VARIANT STRAINS OF *E. coli*  
Randy Clower, Dr. Sharon Zabloutney (advisor), SUNY Fredonia

Eighty-eight strains of gram-negative bacteria isolated from Lake Erie and its tributaries were characterized through biochemical tests and antibiotic resistance profiles. Strains presumptively identified as *E. coli* growth on MUG and the IMViC tests were analyzed for resistance against nine antibiotics (chlortetracycline, oxytetracycline, streptomycin, amoxicillin, erythromycin, tetracycline, nalidixic acid, ampicillin and gentamicin). 12.5% of the strains showed resistance to three or more antibiotics. Characterization of the molecular basis for the resistance to selected antibiotics were assessed using PCR.

- M2** APOPTOTIC LOCALIZATION OF PORPHYRIN PHOTODYNAMIC THERAPY  
ON RADIATION-INDUCED FIBROSARCOMA CELLS  
Michelle Good, Raymond W. Delucci, Christopher V. DeSimone, Dr. Robert S. Greene, Department of Biology, Niagara University

Photodynamic therapy has been utilized in treating a number of malignancies. Hematoporphyrin (HPPH), meso-tetra-4-N-methyl porphyrin (T4), meso-tetra-4-N-N-N-trimethylanilinium porphyrin chloride (TAPP) are experimental photosensitizing agents suspected of producing apoptosis after exposure to UV light. HPPH localizes in the cytoplasm; T4 acts in the nucleus and cytoplasm; TAPP is concentrated exclusively in the nucleus of radiation-induced fibrosarcoma (RIF) cells (Greene and Tobin). RIF cells were grown in culture and assays performed to determine correlation of localization with apoptotic effects. Gel electrophoresis was used to determine the drugs' effect upon super-coiled plasmid DNA in the presence and absence of light. Fluorescent microscopy was utilized to determine the morphological differences between normal and apoptotic cells in the cytoplasm and nucleus. Results indicate a correlation between DNA interaction and the localization preference for the drugs (Greene and Tobin).

- M3** THE APPLICATION OF CASE STUDY ANALYSES TO ONLINE BIOINFORMATICS TOOLS  
Stacy Lockhart and Mark Gallo, Department of Biology, Niagara University

Computers have become increasingly important in both the molecular biology laboratory and in the classroom. Sadly, too few students have access to the programs and technology that are needed to understand the growing complexity of the field of bioinformatics. However, it is important for students to be exposed to new concepts and advances in biology. A tutorial was constructed to instruct a student on the various steps that are used by scientists to discover the identity of an unknown protein through bioinformatics. It is easier for a student to comprehend the steps of the process and the methodology behind it if the process has a real world application. Several case studies were constructed to provide a robust learning experience for the student that link a biological phenomenon to the appropriate online tools to investigate the problem.

**M4 CLONING AND CHARACTERIZING SOYBEAN ENOYL-ACP REDUCTASE AND 3-KETOACYL-ACP REDUCTASE GENES.**

Jennifer Lewis\*, Del Lucent, Emily Sheston, Adam Soares, Nadia Terzaghi, Jeff Ward, William Terzaghi  
Department Biology, Wilkes University, Wilkes-Barre, PA 18766

The fatty acid composition of plant membranes is proposed to influence plant responses to many environmental stresses, and the composition of seed oils is an important agronomic characteristic. Therefore, understanding how plants regulate fatty acid synthesis is important for improving resistance to various stresses and for improving agronomic characteristics. To help study the regulation of soybean fatty acid synthesis we have cloned portions of a soybean gene encoding enoyl-ACP reductase and of two soybean genes encoding 3-ketoacyl-ACP reductase. We used BLAST to identify conserved regions within these two proteins that have been cloned from other organisms and designed degenerate primers expected to anneal to the mRNA encoding these regions. Using these primers for RT-PCR on soybean mRNA we obtained two fragments of 3-ketoacyl-ACP reductase and one of enoyl-ACP reductase. We have studied the expression of these genes by Northern analysis and by RT-PCR. Both are expressed more highly in leaves than in roots, and we are presently comparing their patterns of expression during development and in response to various environmental conditions.

**M5 COMPARISON OF OXYGEN CONSUMPTION AND BASAL METABOLIC RATE OF HAIRLESS AND HAIRY SPRAGUE DAWLEY RATS.**

Katja Gist, Charlene Delesline, Tom King, and Ruth Rollin.  
Central Connecticut State University

**Purpose:** The primary objective was to compare oxygen consumption and basal metabolic rates of homozygous hairless mutant rats and homozygous hairy wild type rats, and backcross hairless rats and backcross hairy rats at 2, 4, 6, 10 and 12 months of age. Comparisons were made between the same sex rats at each age group. **Methods:** Rats were placed in a sealed chamber, the pressure in the chamber was adjusted every 2 min to keep pressure constant. Changes in pressure represented oxygen consumed by the rat. Oxygen consumed was expressed as ml/100 g body weight/min. Basal metabolic rate was determined indirectly from oxygen consumption. **Results:** All hairless rats had higher oxygen consumption and basal metabolic rates than hairy rats. These oxygen consumption differences were statistically significant except for 2 and 10 month old male rats and 4 month old female rats. The differences in basal metabolic rates were statistically different between the hairless and hairy rats, except for the 4 month old females. The oxygen consumption and basal metabolic rates for backcross rats were variable. Most of the backcross hairless rats had higher oxygen consumption and higher basal metabolic rates than the backcross hairy rats. One exception were 12 month old female rats in which the hairy backcross rats had higher oxygen consumption and basal metabolic rates than the hairless backcross counterparts. There were statistically significant differences in oxygen consumption and basal metabolic rate between hairless backcross and hairy backcross groups except for the 2, 10, and 12 month old males and females. **Conclusion:** It was assumed that the hairless rats would have higher oxygen consumption and metabolic rates than their hairy counterparts in order to keep warm. This characterization of the oxygen consumption and basal metabolic rates of hairless and hairy rats has shown that this is true at certain ages in rats.

**M6 CONSTRUCTION OF E.COLI-STREPTOMYCES SHUTTLE VECTORS CONTAINING THE EGFP GENE AND THE dnrN REGULATORY REGION**

Heather Lynch, Jessica Kajfasz, Jean Gallo, and Mark Gallo  
Department of Biology, Niagara University

The green fluorescent protein and its derivatives have been used as molecular markers to follow cellular processes in many organisms. It has been used in many bacterial systems including both Gram-negative and Gram-positive organisms. Streptomyces are Gram-positive filamentous bacteria that are responsible for production of a majority of pharmacologically-active natural compounds, including daunorubicin, an anti-cancer agent. The daunorubicin biosynthesis pathway in Streptomyces peucetius ATCC 29050 is very complex, consisting of many genes. Several regulatory elements have been identified. One of them, dnrN, is believed to be involved in the early steps of the process. The investigators have created several plasmids containing the regulatory region from dnrN upstream to a promoterless copy of enhanced green fluorescent protein (EGFP). The plasmids will be used to investigate the temporal and spatial patterns of dnrN expression in *S. peucetius*.

**M7 CONSTRUCTION OF E.COLI-STREPTOMYCES SHUTTLE VECTORS CONTAINING THE EGFP GENE FOR THE STUDY OF THE REGULATION OF THE dnrO GENE**

Matthew Fernaays, John Varga, Jean Gallo, and Mark Gallo  
Department of Biology, Niagara University

Daunorubicin, and its derivative Doxorubicin, are important compounds used in anti-cancer therapeutic regimens. These compounds are produced via a complex biosynthetic pathway by Streptomyces peucetius ATCC 29050; a Gram-positive, differentiating, filamentous soil bacteria. Equally complex is the network of regulatory elements that control this pathway. One of these elements that has been identified thus far is the dnrO gene. The investigators have constructed several plasmids containing various portions of the 5 regulatory region of the dnrO gene from *S. peucetius* ATCC 29050. Each plasmid contains a promoterless copy of the enhanced green fluorescent protein (EGFP) gene located downstream from the regulatory region of study. These constructs will be used for the investigation and elucidation of dnrO expression in both a spatial and temporal fashion.

**M8 DETERMINING PHOTOSYNTHETIC CHARACTERISTICS OF RED AND WHITE OAK SEEDLINGS.**

Del Lucent\*, Jason McDermott, Tom Contreras, Michael Steele, William Terzaghi, Department Biology, Wilkes University, Wilkes-Barre, PA 18766

We have found that squirrels cache viable acorns of the red oak group much more frequently than those of the white oak group. Therefore, we predict that red oak seedlings acclimate to differing conditions more readily than white oaks. To test this hypothesis we have grown red and white oak seedlings under identical conditions and compared their photosynthetic characteristics. Red oak seedlings grown in a chamber become light-saturated at 500 moles/m<sup>2</sup>/sec whereas white oak seedlings grown alongside become light saturated at only 100 moles/m<sup>2</sup>/sec. Compensation points are 30 moles/m<sup>2</sup>/sec and 10 moles/m<sup>2</sup>/sec, respectively, for red and white oak seedlings. These data indicate that red oak seedlings behave like sun plants, whereas white oaks behave light shade plants. We are now growing red and white oaks under a variety of light intensities in order to compare their abilities to acclimate to varying light regimes.

M9 DETERMINING RELATIONSHIPS BETWEEN OAK SEEDLINGS AND ADULT TREES IN  
NATIVE FORESTS BY DNA FINGERPRINTING

Jeff Ward\*#, Michael V. Brown#, John Carlson^, Tom Contreras#,  
Tiffany Leptuck#, Jennifer Lewis#, Del Lucent#, Judith Menk^, Emily  
Sheston#, Peter Smallwood\$, Adam Soares#, Michael Steele#, Nadia  
Terzaghi#, William Terzaghi#  
#Department Biology, Wilkes University, Wilkes-Barre, PA 18766  
^Pennsylvania State University  
\$Department Biology, University of Richmond, Richmond, VA

Squirrels tend to cache viable acorns of the red oak group much more frequently than those of the white oak group. We hypothesized that seedlings from red oak species should therefore be widely dispersed from their parent trees, while those from white oaks should be clumped near the parent tree. We have used DNA fingerprinting to test this hypothesis. We have sampled over 500 adult and seedling oak trees at two sites in two different oak forests. At one site we have extracted DNA from 565 seedlings and 68 parent trees; we are still extracting DNA from the samples collected at the second site. We have identified 9 primer pairs which reliably amplify STRs that show a significant amount of polymorphism in *Quercus alba*, *Q. velutina* and *Q. rubra*. We are now matching the seedling profiles of seedlings and adult trees. This will then allow us to directly measure dispersal distances between adult trees and their seedling offspring, and to measure the genetic structure of these oak forests.

M10 EFFECTS OF LONG-TERM WHEEL DEPRIVATION ON RUNNING IN VASOPRESSIN-  
CONTAINING AND VASOPRESSIN-DEFICIENT RATS  
Allison Brown, John Carroll University

The effects of long-term wheel deprivation on running in vasopressin (VP)-containing (Long Evans) and VP-deficient (Brattleboro) rats were explored. The LE and DI rats were divided into two groups: control animals allowed to run freely in the activity wheel throughout the experiment (LE-F and DI-F) and experimental animals whose running was prohibited by locking the activity wheel (LE-L and DI-L). After an habituation period of 7 days in which all animals had unlimited access to the running wheel, the LE-L and DI-L animals were subjected to a 15 day period in which they were prohibited from running. Following this period, the wheels were unlocked and animals had unlimited access to the running wheel for 10 days. During the habituation period, similar running patterns were observed for the LE-F, DI-F, LE-L, and DI-L animals. Over the next 15 days, LE-F and DI-F animals continued to have similar running patterns. During the final 10 days of the experiment, a separation in running activity developed with the DI-F rats running increasingly more than the LE-F rats. Just the opposite occurred with the animals that had been in locked cages. The LE-L rats began running more than the DI-L rats and, as the end of the experiment approached, the separation widened. This would indicate that VP has an effect on the manner in which a rat recovers from wheel deprivation. In addition, despite not being able to run for 15 days, both strains of rats ran just as much after unlocking the wheel as if they had never been deprived. The LE-F rats actually ran more after deprivation. These findings challenge the "detraining" theory, which states that a suppression of running will occur as a consequence of terminating exercise for a period of time.

M11 GROWTH COMPARISON OF HALIMEDA SPECIES AND GORGONIAN CORAL COLONIES  
USING BOTH FLUORESCENT AND ACTINIC BLUE/10,000K LIGHTING  
Shanna Hall, Saint Francis University

The research completed tested the rate of growth for the plant species, Halimeda, and the animal species, Gorgonia, under two various lighting systems. The Actinic Blue/10,000K light system and the basic Fluorescent light system were chosen to test these particular species of plant and animal. The results were anticipated to show that the expensive Actinic Blue/10,000K aquarium light system would prove to be more adequate for the light dependent plant and animal species than the basic Fluorescent light system.

However, the results that were obtained were not the results that were expected. Each species decreased in growth weight over the 8-9 week period of experimentation. The lighting systems alone, most likely, did not cause the growth rate of these species to decline. Many other factors may have contributed to this decrease. Other research and setup techniques could have been used in this experiment, which may have provided for better results.

M12 AN INVESTIGATION OF THE VARYING TRANSCRIPTIONAL SILENCING  
CAPABILITIES OF THE RAP1 SEQUENCE.  
James J. Gides, John Trimble Ph.D., Susan Reimer Ph.D.  
Saint Francis University, Loretto, PA

Transcriptional silencers are elements within a cell which possess the power to greatly decrease the expression of genes in their vicinity. They are DNA elements which, when bound by silencing proteins, prevent RNA polymerase from producing messenger ribonucleic acid(mRNA) from surrounding DNA in the process of transcription(Zhang,1995). The function of silencers has been found to have an effect even over great distances, sometimes 3000 base pairs or more, and are orientation independent, meaning they work even if inserted backwards (Laurenson and Rine,1992). In the proposed research, several different plasmid constructs were examined in order to quantify the amount of transcriptional silencing that occurs within each. More specifically, variations of an autonomously replicating sequence(ARS), which is capable of acting as an origin of replication or a silencer, and binding site for the RAP 1 protein, which is known to be both an enhancer as well as a silencer depending on its position and surroundings, will be placed in plasmids, transformed into yeast cells, and assayed to measure transcriptional activity. RAP1 is a binding site on the DNA that generally acts as an enhancer alone, but when placed near an ARS element acts as a silencer with varying capabilities. What is unknown is whether the insertion of RAP1, given a plasmid in which there is no other origin, and the inserted ARS must fire as the origin of replication, will compromise the ARS s silencing capabilities. The research examines each of these possibilities in order to form conclusions about how transcriptional silencing is affected by the above situations. Both qualitative and quantitative levels of this activity were measured through the use of the X-gal and B-galactosidase assays respectively, and results of the experiments are currently being repeated for verification of results.

**M13** MECHANISMS UNDERLYING THE T4-INDUCED DECREASE IN PLASMA MELATONIN IN BULLFROG TADPOLES: THE ANOMALOUS EFFECT OF T4 ADMINISTRATION ON TISSUE MELATONIN, AND THE PINEAL GLAND IN VITRO.

Tara A. Shea, Elms College

Melatonin decreases in the plasma of *Rana catesbeiana* (bullfrog) tadpoles at the climax of metamorphosis when thyroxine (T4) levels peak. Therefore, melatonin may interact with T4 in the hormonal control of metamorphosis. Previous work showed that plasma melatonin is rapidly cleared from the blood upon immersion in T4. It is possible that melatonin might accumulate in the tissues when cleared from the plasma. In two separate experiments, tadpoles were treated with 50 g/l of T4 by immersion for three days. Following treatment, six tissues were taken, including the gill, intestine, thyroid, tail muscle, leg muscle, and the pineal to see if there was any change in the levels of melatonin in the glands and tissues. However, there was no significant increase in tissue or glandular melatonin. T4 might also inhibit pineal secretion of melatonin, thus decreasing melatonin levels in the plasma at climax. When pineals were cultured with T4 however, T4 increased the secretion of melatonin by the pineal in prometamorphic, premetamorphic and climax tadpoles, and also in froglets. It is possible that most of the circulating melatonin in the tadpole comes from the eyes, and that metamorphic changes decrease ocular melatonin, while stimulating the pineal. Further work will be done in our lab to test this hypothesis.

**M14** METAMORPHIC HORMONES : HOW ARE THEY INFLUENCED BY LIGHT/DARK CYCLES AND DAY/NIGHT TEMPERATURE CHANGES IN RANA CATESBEIANA ?

Nicole K. Bruni, Elms College

The metamorphic process of anurans is influenced by a number of hormone which appear to be synchronized by light/dark (LD) cycles. T4, has a direct influence on the metamorphic process and is highest in the plasma at climax when melatonin is lowest in the plasma. This inverse relationship between T4 and melatonin has been observed in our lab under varying LD cycles with a constant temperature of 22° C. Work done under natural June conditions in Nashville, TN (14.5L:9.5D with a day temperature of 30° C and a night temperature of 18° C ) supported the findings of previous work in that the inverse relationship between T4 and melatonin under constant temperature was also found under natural conditions. However, in contrast to prior experiments with constant temperatures, the T4 rhythm shifted when there was a day/night temperature change. In order to distinguish between the effects of temperature and that of the LD cycle, a similar experiment was done with a day/night temperature cycle of 14.5 hr at 30° C and 9.5 hr at 18° C but on a regimen of constant light. Groups of prometamorphic and climax tadpoles were sacrificed throughout a 24 hour period in which plasma and eyes were collected. Radioimmunoassays were performed to determine the level of T4 and plasma and ocular melatonin. Results showed that the T4 rhythm shifted from prometamorphosis to climax suggesting that the fluctuating day/night temperature change caused the T4 shift. Both plasma and ocular melatonin rhythms lacked the sustained peak in the dark at climax under constant light suggesting that the LD cycle, rather than temperature regulates the melatonin rhythms.

## M15 POPULATION GENETICS OF *Escherichia coli*

Zina Capute, Wesley Konsavage (Captain), Sonya Smereczynsky  
and Dr. K. Pidcock, Department of Biology, Wilkes University

Previous studies have shown that mercury resistant fecal coliforms can be isolated from the Susquehanna River, and vary greatly in their resistance to mercury. These mercury resistant bacteria were also more likely to be resistant to antibiotics. It has been known that resistance to both mercury and antibiotics are encoded on plasmids, transposons, and other such extrachromosomal DNA. In addition, virulence factors may also be encoded by such DNA molecules. It is known that diverse chromosomal genotypes can be identified within bacterial species, including *Escherichia coli*. We are interested in whether acquisition of mercury resistance and other foreign genes is random with respect to such genotypes. This can be investigated using multilocus enzyme electroporetic analysis.

## M16 REGULATIONS OF THE PLASMA MELATONIN LEVEL IN BULLFROG TADPOLES: CLEARANCE OF HIGH LEVELS OF EXOGENOUS MELATONIN FROM THE PLASMA INVOLVES INCREASED TISSUE CONCENTRATION OF THE HORMONE Lucy Francisco and Brooke Ramah, Elms College

Melatonin (ML) is a hormone that is found in the plasma, and is secreted by the pineal gland and the retina. It may play a role in amphibian metamorphosis, but its effects are controversial. It seems to antagonize or accelerate metamorphosis depending at least partly on the mode of administration and the concentration. In one experiment, picogram, nanogram, or microgram quantities of ML were administered to tadpoles and the animals were sacrificed one-half-hour after the injection. 30 picograms and 30 nanograms ML significantly raised plasma ML, with 30 nanograms having the greatest effect. When tadpoles were injected with 30 micrograms, however, plasma ML was not raised significantly above the control. This showed that exogenous ML is cleared from the plasma rather quickly when high levels are administered. The next experiment was performed in order to determine if high levels of injected ML were concentrated in the tissues. Tadpoles were injected with 30 micrograms of ML one-half-hour before sacrifice and thyroid and pineal glands, and gill, limb, tail, and gut tissues were taken, extracted, and analyzed for ML content by radioimmunoassay. There was a significant increase of ML in the glands and the tissues except for the gut, indicating that the clearance of microgram quantities of ML from the plasma is accompanied by concentration of the hormone in the tissues. Research is continuing to study the effect of nanogram levels of exogenous ML on plasma hormones and tissue melatonin concentrations.

## M17 STRATEGIES FOR ISOLATION OF THE GENE MUTATED IN THE mshi MOUSE.

Sara Patterson and Kathy Martin-Troy. Central Connecticut State University.

The mshi mutation causes male sterility and alters graft acceptance in the mouse. It has been mapped to a region of Chromosome 10 by linkage analysis with a set of random DNA markers on the chromosome. We are now attempting to analyze the integrity of the mutant chromosome by Southern blot using digoxigenin-labeled PCR probes. Our probes are constructed from primer pairs that show tight linkage to the mshi mutation and hybridization is done to digested genomic DNA from mutant mice, wild type mice, and heterozygous mshi/+ mice. These Southern blots should be able to define whether a large chromosomal rearrangement is responsible for the mutant phenotype and provide the basis of our first steps in physically isolating this region of Chromosome 10 from the bulk of the mouse genome.

**M18** A STUDY OF DOMESTIC CHICKEN ROOSTING BEHAVIOR:

WHO SITS NEXT TO WHOM, AND TOWARD WHOM DO THEY TUCK THEIR BILLS?

Rebecca L. Bors and Sylvia L. Halkin, Central Connecticut State University

Past research has shown that in wild flocks of shorebirds, bill-tucking was directed towards the outside of the flock, or in the direction of recent disturbance, which may enhance the birds' awareness of and readiness to defend their most exposed or threatened side. This study tests whether a flock of domestic chickens exhibits similar patterns of behavior. The position of chickens along the perch also provides information about whether individual chickens consistently roost next to particular other individuals, or in particular locations, and whether the identity of the chicken(s) roosting next to any given chicken influences that chicken's bill-tucking side.

**M19** SYNERGISM IN HYDROXYUREA-INDUCED APOPTOSIS:

THE EFFECTS OF CAFFEINE AND INTERFERON-ALPHA

Ruth E. Freeburg and Robert S. Greene

Department of Biology, Niagara University

The ribonucleotide reductase inhibitor, hydroxyurea (HU), is utilized as a chemotherapeutic agent in a number of malignancies, sickle cell anemia, and, more recently, HIV. The antitumor, antiproliferative, and immune-enhancing properties of interferon-alpha (IFN) have indicated its use for a number of diseases, while caffeine has been used with HU to force some mammalian cells into mitosis without DNA replication. Radiation-induced fibrosarcoma (RIF) cells and HL60 (promyelocytic) cells were grown in culture and treated with HU alone, HU plus IFN, and HU plus caffeine. Post-treatment apoptosis was examined by gel electrophoresis and fluorescent microscopy. IFN with HU may have a synergistic effect upon apoptosis at high HU levels while lower HU dosage has an antagonistic or minimal effect upon apoptosis. Results of HU with caffeine indicated a dose-dependent synergistic effect upon apoptosis that could have important implications in the treatment of cancer with caffeine-like compounds.

**M20** TREE-CLIMBING ORIENTATION OF WHITE-BREASTED NUTHATCHES (*SITTA CAROLINENSIS*)

Matthew G. O Driscoll, Central Connecticut State University

When animals have options to use different patterns of locomotion, the pattern of locomotion resulting in less energy expenditure will be favored (all else being equal). For some tree foraging birds, there is the option to move along tree trunks in either an upward or a downward direction. Moving predominantly upward along tree trunks means that flights between trees will most often be downward, while moving predominantly downward along tree trunks means that flights between trees will most often be upward. In an optimal locomotion model developed by R. Norberg (1979), upward and downward climbing are assumed to have approximately equal energetic costs, but upward flight requires more energy than downward flight due to the need to work against gravity, so the upward climbing/downward flight pattern is predicted to be favored. White-breasted nuthatches are an appropriate species to test this model because they have been observed climbing in both directions, while other species may have structural impediments to climbing down. My data for white-breasted nuthatches seem to support Norberg's predictions, with upward climbing and downward flight occurring most often. For both nuthatches moving upward and downward along trunks, probing and pecking most often occurred with the head facing down (birds climbing upward turned around to probe or peck at bark).



**M21 THE USE OF MULTIPLE ANTIBIOTIC RESISTANCE PROFILES TO DETERMINE THE SOURCE OF FECAL CONTAMINATION IN DUNKIRK BAY OF LAKE ERIE**  
Matt Aboudara, State University of New York at Fredonia

The recently reported high levels of *Escherichia coli* in Dunkirk Bay of Lake Erie have prompted us to undertake the task of analyzing the bacterial pollution levels and to determine the possible sources of the contamination. Pollution from point and nonpoint sources into Lake Erie is a health hazard for recreational users and the general public and is unacceptable. By evaluating the sources of this pollution, we would provide a means for the local environmental agencies to help curb this problem. Through three months of water and fecal collection, seventy-three *E. coli* and forty-five *Enterococcus* organisms were isolated. From the abundant seagull population, fecal samples were collected and the appropriate organisms were isolated. An antibiotic sensitivity screening test on forty-two randomly chosen *E. coli* organisms was performed with seven different antibiotics. The organisms exhibited a high level of resistance to many of these antibiotics and were in high concentrations at the collection sites after periods of heavy rainfall.

**M22 USE OF PFGE TECHNOLOGY IN ANALYZING CHROMOSOME STRUCTURE.**

Daniel Roullard, Susana Barraza, Emilie Kidder, and Kathy Martin-Troy.  
Central Connecticut State University.

Our department has recently obtained the Biorad pulsed-field gel electrophoresis system. We are beginning our work by refining methods for separating chromosome-sized segments of yeast DNA in this system. Our initial attempts involve separation of yeast chromosomes from normal yeast and a yeast strain that contains a YAC vector. Once the resolution of our system is adequate we intend to do a Southern blot probing Not-1 digested rat DNA with a digoxigenin-labeled probe that maps very close to the location of the shorn gene whose mutant allele causes hairlessness in the homozygous rat. This technology will ultimately allow us to define a YAC or PAC library member that contains the shorn gene so that we can physically isolate the gene and begin studies of its function in hair development.

**M23 USE OF TOLLUIDINE-BLUE-STAINED SEMITHIN SECTIONS TO RECOGNIZE APOPTOTIC PROFILES IN DEVELOPING ZEBRAFISH BRAIN**

Margaret E. Fiasconaro<sup>1</sup>, Robert L. Khouri<sup>2</sup>, Grace Cacucciolo<sup>2</sup>, Sahani Howie<sup>2</sup>, Jacqueline Nguyen<sup>2</sup> and Zoltan L. Fulop<sup>2\*</sup>  
Departments of Chemistry<sup>1</sup> and Biology <sup>2</sup>, Wagner College, Staten Island, New York 10301, \* Faculty advisor

It is a well-established fact that the number of neuro- and/or glioblasts in the developing vertebrate brain largely exceeds the number of neurons and glial cells that reach full maturity in the adult brain. Cells that fail to differentiate into a functionally fit, mature form are programmed to die.

Programmed cell death or apoptosis is a process that is initiated within and results in the transition of affected cells into pyknotic forms that can be recognized. One  $\mu\text{m}$  thick, so called semithin sections obtained from plastic embedded tissue samples using a glass knife and an ultratome give a high resolution light microscopic image that is believed to be as detailed as a low magnification electronmicrograph. In this study an attempt was made to use tolluidine-blue-stained semithin sections to recognize apoptotic profiles in developing zebrafish brain. Acknowledgement: This study was supported by George and Eva Megerle

## MOLECULAR BIOLOGY and GENETICS

### M24 ANALYSIS OF STRUCTURE OF pp32R1,

A TUMORIGENIC FAMILY MEMBER OF THE pp32 GENE FAMILY.

Hopkins, Tom J., Wagner College

R. Cheung, J.R. Brody and G. Pasternack, The Johns Hopkins University  
School of Medicine

pp32R1 is a member of the pp32 gene family found on human chromosome four that has oncogenic properties. In a previous study, the structure-function relationship of the tumor suppressor gene pp32, a member of this family, was analyzed for its transformation inhibition function. Through that study, we found the region of the protein important for the transformation inhibition function to be amino acids 150-174. The next step in this structure-function analysis of this complex gene family is concerned with identifying the tumorigenic region of pp32R1. A deletion construct of pp32R1 has been made which removes the acidic tail of the protein and amino acid residues homologous to the 150-174 amino acids of pp32. This region is a region of divergence between the tumor suppressor gene pp32 and the tumorigenic pp32R1. Identifying a region of divergence in structure and function between these two molecules is an important step in clarifying the different pathways by which these proteins affect tumorigenesis.

### M25 ARE DNA REPAIR ENZYMES AFFECTED DURING KAINIC ACID INDUCED EPILEPTIC SEIZURES?

Jason Belejack, Karen Gilliam, Wesleyan University.

DNA-dependent protein kinase (DNA-PK) is an enzyme that is involved in the repair of double-strand DNA breaks (DSB's) that result from numerous factors. We are interested in determining if a point mutation in the catalytic subunit of DNA-PK (DNA-PKcs) in mice, known as SCID, elicit more cell death following a neuropathological insult. The model system used involves wildtype and SCID that receive a subcutaneous injection of kainic acid. Kainic acid is a glutamate analog that induces epileptic seizures. Preliminary data show that the latency to seizure onset in the SCID mice is shorter when compared to the wildtype and the spread of degenerating neurons is greater throughout the hippocampus. Degenerating neurons were identified using Fluoro-Jade, a novel dye that selectively labels them, although it does not indicate mechanism of cell death. Sections of brain tissue were studied using immunofluorescent microscopy to quantify viable cells vs degenerating cells. Primary and secondary antibodies were used to identify cell types undergoing degeneration and to characterize the proteins involved in apoptosis. The goal is to determine the role of DNA-PK in the cerebral cortex of adult mice following neuropathological injury, as well as to determine if DNA repair enzyme deficit leads to an increase in neuronal degeneration.

**M26** CHARACTERIZATION OF COLIFORM BACTERIA BY MOLECULAR ANALYSIS  
OF THEIR 16S RIBOSOMAL RNA GENES  
Ben Dickerman and Theodore Lee  
Biology Department, SUNY Fredonia, Fredonia, NY 14063

Coliform bacteria isolated from two beaches on Lake Erie were identified by molecular methods. Bacteria were isolated on Endo agar, a selective and differential medium. The 16S rRNA gene was amplified from these colonies using the polymerase chain reaction (PCR). Restriction length polymorphism analysis (RFLP) was performed on the 16S rRNA PCR products. The RFLP data indicated that the isolated organisms were closely related as the restriction fragments gave similar banding patterns after agarose gel electrophoresis. The PCR products will also be characterized by DNA sequencing. The sequences will be analyzed using the Ribosome Database Project phylogenetic programs. The goal of this research is to use molecular methods to rapidly identify bacteria isolated from aquatic ecosystems.

**M27** CLONING OF THE ASTEROID GENE FOR GERMLINE TRANSFORMATION  
IN DROSOPHILA MELANOGASTER.  
Florence Breslin and Michael A. Kotarski, Department of Biology,  
Niagara University, Niagara University, NY 14109

Mutations of the asteroid gene of *Drosophila melanogaster* do not produce an overt visible phenotype but do enhance the mutant phenotypes of *Star* and *Egfr*. An asteroid mutation can be seen as an enhancer of the small jumbled eye typical of defects in genes in the *Egfr* pathway. The goal of this experiment is to clone the entire asteroid gene on a single fragment of DNA suitable for germline transformation. A 3' fragment of the gene was produced by amplification using PCR and was ligated to the 5' fragment in a two-step ligation in the pW8 vector. This will be used for germline transformation into a strain of *Drosophila* to determine the effects of extra copies of the asteroid gene on normal development.

**M28** GENETICS OF THE SHORN (*shn*) MUTATION IN THE RAT I:  
LINKAGE ON THE DISTAL TIP OF CHROMOSOME 7.  
Jeannette Loman, Denise Castonguay, Joanna Jeruzal, Rachel Chrissluis,  
Eneze Abugunde, Sara Patterson & Thomas R. King.  
Department of Biological Sciences, Central Connecticut State University

A litter including several hypotrichotic rats (lacking normal hairy coats) was discovered 8 years ago among a colony of hairy albino rats at CCSU. A series of crosses among these rats and their hairy litter mates revealed that the hypotrichotic phenotype is heritable and generated by an autosomal recessive gene (designated *shn*, for shorn). To locate the position of *shn* among the 20 rat autosomes, an intraspecific backcross was conducted. Molecular analysis of the backcross progeny for inheritance of polymorphic DNA markers allowed us to eliminate the majority of the chromosomes as possible locations for *shn*. By contrast, *shn* is closely linked with markers from the distal tip of chromosome 7, where no prior hypotrichotic mutations exist in the rat. However, the genetic map of the homologous region in mouse, distal chromosome 15, does include several possible orthologues and gene candidates for *shn*. Fine-structure mapping near *shn* may suggest recombination-suppression in the region of the mutation. This observation may suggest an inversion model for the basis of the *shn* mutation.

**M29** GENETICS OF THE SHORN (shn) MUTATION IN THE RAT II: PLEIOTROPISM INVOLVING FOLLICULAR DEVELOPMENT, KIDNEY FUNCTION, AND MATERNAL SUCCESS.

Denise Castonguay, Peter Berry, Joseph Carpentino,  
Jeannette Loman and Thomas R. King.

Department of Biological Sciences, Central Connecticut State University

A litter including several hypotrichotic rats (lacking normal hairy coats) was discovered 8 years ago among a colony of hairy albino rats at CCSU. A series of crosses among these rats and their hairy litter mates revealed that the hypotrichotic phenotype is heritable and generated by an autosomal recessive gene (designated shn, for shorn). To detect any pleiotropic effects of the mutation, we have histologically compared various tissues from mutant (shn/shn) and non-mutant (shn/+) siblings at a variety of ages. Mutants succumb at 11-14 months of age, apparently due to progressive kidney failure. In addition, mutant mothers, while producing normal sized litters, successfully rear only small numbers of progeny. To explain these pleiotropic features of shn, we suggest that an inversion on rat chromosome 7 could have simultaneously disrupted two genes: one involved in hair production, and one involved in secretory function.

**M30** IDENTIFICATION OF H-HIX MINOR HISTOCOMPATIBILITY HAPLOTYPES IN MICE

Izabela Krakowiak, Jeannette Loman, and Thomas R. King

Department of Biological Sciences, Central Connecticut State University

To detect the presence of X-linked barriers to histocompatibility in mice, reciprocal sets of (C57BL/6 x BALB/c) F1 mice were grafted with tail skin from the respective paternal inbred strain. The histogenic analysis suggested that compared with the C57BL/6 mouse strain, the BALB/c strain generates X-linked antigen-loss that we have provisionally designated H-hixc, for histocompatibility on the X chromosome, c haplotype.

To determine if other mouse strain combinations would allow identification of additional H-hix loci, we have set up a new experiment to check for X-linked histocompatibility differences between strains DBA/2J and BALB/c. If such a difference is found and mapped, we will be able to test whether these two X-linked antigenicities are due to multiple alleles of a single H-hix gene (the classical model) or whether the differences are instead due to distinct X-linked genes that play a role in histocompatibility and graft rejection.

**M31** MYELIN PROTEIN TARGETING IN MDCK CELLS

Stacey L. Brand, John Carroll University

Myelinating cells have several distinct membrane domains. The myelin protein PO and the large and small isoforms of myelin-associated glycoprotein (L-MAG and S-MAG) are differentially targeted to these domains, but the exact mechanisms responsible are unknown. To investigate whether these proteins contain endogenous targeting signals and whether homotypic and heterotypic interactions influence sorting and targeting, we transfected Madin-Darby canine kidney (MDCK) cells with combinations of these proteins and investigated targeting pathways using immunocytochemistry. In both transient and stable transfectants, the three proteins had different membrane distributions. PO was selectively concentrated in lateral membranes and was not detected at the apical surface. In contrast, S-MAG was highly enriched in the apical membrane. L-MAG, which has a longer cytoplasmic tail containing putative endocytosis signals, was detected in both apical and basolateral membranes. Similar distributions were observed when the proteins were cotransfected and when mixed cultures of expressing and non-expressing cells were examined. These results suggest that PO, L-MAG, and S-MAG contain targeting signals that are recognized by MDCK cells and sufficient to direct their targeting to different membrane domains.

### M32 P ELEMENT EXCISION AT THE STAR AND ASTEROID GENES OF DROSOPHILA

Jamie Lee Krell and Michael Kotarski, Department of Biology  
Niagara University, Niagara, NY 14109 mmk@niagara.edu

Both the asteroid and Star genes of *Drosophila melanogaster* function in the Egfr signaling pathway in embryogenesis and compound eye development. Mutations of asteroid are similar in phenotype to mutations of Star. The two genes lie in a head to head arrangement only 186 bp apart. This unusually small region 5' to each gene may contain elements that regulate the expression of both genes. In order to identify these elements, P element excisions were used to produce mutations that affect the development of the eye. The mutants were analyzed using the polymerase chain reaction to amplify the region where the element was inserted in order to describe the mutations at the DNA level.

### M33 THE ROLE OF AUTONOMOUSLY REPLICATING SEQUENCES (ARS) AS ORIGINS OF REPLICATION AND SILENCERS USING REPLICATION ORIGINS ON ARS PLASMIDS IN SACCHAROMYCES CEREVISIAE

Jason Krahnke, Dr. Sue Reimer, Saint Francis University

Silencers in *Saccharomyces cerevisiae* are known to repress transcription. Silencers in *S. cerevisiae* are composed of an origin of replication (ARS) and a RAP1 (Repressor Activator Protein 1) binding site. Through the use of a Plasmid Loss Rate Assay (PLR), the stability of plasmids carrying ARS elements within silencers was compared to the stability of plasmids carrying ARS elements alone. The lower the percent loss of the plasmid, the more stable the plasmid was, which indicated the replication ability of the ARS. Our data demonstrates that the ARS element within a silencer is a better origin of replication than an ARS element alone.

## MICROBIOLOGY POSTER ABSTRACTS

### M34 PURIFICATION OF ANTIBIOTICS FROM SOIL BACTERIA

Tammy Bagdigian, Brandon Elliott, Konrad Sliwinski, Faranak Mohseni,  
and Michael Davis, Central Connecticut State University

The extensive use of antibiotics has led to the evolution of large numbers of antibiotic resistant bacteria, negating the use of those antibiotics as chemotherapeutic agents for treating human infectious diseases. One strategy to combat this problem is the continual discovery of new antibiotics unrelated to those in common use. Many commercially available antibiotics were originally purified from microorganisms that live in diverse communities and which use those antibiotic chemicals to suppress the growth of competing microbial species. We have isolated large numbers of soil bacteria which produce diffusible factors that interfere with the growth of other microbial species. These diffusible antibacterial compounds vary widely in their spectrum of activity and apparent potency. For several of these soil isolates, we have studied the effects of different growth conditions on production of the antibacterial substances. At least one isolate appears to produce its antibacterial compound only when grown on solid media and not when grown in broth, an effect not altogether surprising. We have partially purified the antibacterial compounds from several of these soil bacteria, and have begun to analyze their physical and chemical properties as well as their biological effects on species of bacteria normally associated with humans. Our hope is that some of these antibacterial compounds are chemically and biologically distinct from those previously identified, and may develop into valuable tools in the continuing fight against infectious disease.

### M35 THE USE OF BACTERIOPHAGE TO TREAT ACNE, A BACTERIAL DISEASE

Christine Hany, Summer Armack, Dena Bacinskas, Kelley Scanlon, Torrence Nicholson, Jessica Wearne, and Michael Davis  
Central Connecticut State University

Most people experience the skin disease acne to some degree, often during late adolescence or early adulthood. Though this disease is never life-threatening, it can have significant psychological effects, and is often aggressively treated by a variety of methods. Though acne has many forms and a complex etiology, the progression from minor forms (blackheads) to serious infections (cysts, pustules) is primarily caused by actions of *Propionibacterium acnes*, a minor member of the normal microflora of human skin. Antibiotic therapy is a common treatment for these severe forms of acne, though the rise of antibiotic resistant strains has compromised the effectiveness of antibiotics like tetracycline. We are trying to develop a new strategy for limiting the proliferation of *P. acnes* by killing the bacteria with bacteriophage (bacteria-specific viruses). There are many advantages of phage therapy over standard antibiotic treatment. We have collected a large number of independent *P. acnes* isolates both as a source of test organisms to validate the concept of phage therapy and as a source of bacteriophage which parasitize *P. acnes* cells. We are isolating *P. acnes*-specific bacteriophage and will identify those that have a wide host range within the species *P. acnes*. We will then select for virulent phage mutants which most efficiently lyse host bacteria. We hope that these bacteriophage will ultimately prove useful for the treatment of this important bacterial disease.

### EVOLUTIONARY BIOLOGY ABSTRACTS

#### M36 FINDING THE ASTEROID GENE IN DROSOPHILA SEHELLIA

Rebecca Swinton and Michael Kotarski, Department of Biology, Niagara University, Niagara, NY 14109 mmk@niagara.edu

The asteroid gene has been cloned from *Drosophila melanogaster* and it produces a novel 93 kDa protein. Recent evidence suggests that the Asteroid protein is used in the epidermal growth factor receptor (EGFR) signaling pathway in development but its exact function is unknown. Comparing the DNA sequence of homologous genes from different species to identify conserved regions is a useful tool for determining which sequences of a gene may encode an essential protein domain and can also be used to attribute a function to a protein. To begin a sequence comparison, clones containing the asteroid gene have been isolated from *Drosophila sechellia*, a sibling species in the *melanogaster* species subgroup. A comparison of the PCR amplification products and the restriction maps of the genomic clones from *D. melanogaster* and *D. sechellia* begins to reveal which regions of the gene are conserved.

## AFTERNOON POSTER SESSION

1:00-1:50 Jane Breiseth Gallery, Breiseth Hall

### PSYCHOLOGY POSTER ABSTRACTS

#### N1 THE BASIC EFFECT OF ASSOCIATION TRAINING ON THE STROOP COLOR WORD TASK Jessa D'Achille, Lycoming College

Research shows the Stroop effect to exist in many conditions. This experiment sought to examine this effect at the most basic level, without any potential nuisance variables. 30 participants from a college psychology course were trained using a paired-associate task to connect a nonsense word with a particular color. They were then presented with a modified Stroop task: a list of the learned associations in the correct color followed by a list of the same words in incongruent colors, or vice versa. They were timed on the amount of time necessary to read the list and means were compared. Results were then discussed in terms of the theoretical and practical implications.

#### N2 BODY MASS INDEX (BMI) IN MEDICATED SCHIZOPHRENIC PATIENTS Cerissa Creeden and Laurence J. Nolan, Wagner College

Anti-schizophrenic medications, especially newer (atypical) drugs such as clozapine, have been associated with weight gain in psychiatric patients. The BMI, prescribed medication, and demographic information from 33 male and female adult patients treated in a local state psychiatric hospital were collected to determine whether patients on atypical anti-schizophrenic drugs had higher BMIs than other patients. Contrary to other studies, there was no significant difference in BMI across drug groups. No difference in BMI between men and women was found. Possible explanations for these findings will be presented and future studies outlined.

#### N3 THE EFFECTS OF MOOD INDUCTION ON HUMOR APPRECIATION Jacquelyn M. Martin and Susan L. McGaffick, Ithaca College

Humor has the ability to increase mood in people who are in a negative mood (Moran & Massam, 1999). In this study, the relationship between an induced mood and humor appreciation was examined. Specifically, we were looking to see if participants in negatively induced moods rated jokes as less funny and showed fewer displays of mirth. Subjects were randomly placed in one of three conditions: elated, neutral or depressed. In each condition, mood was induced by exposing the participants to thirty Velten (1968) statements that corresponded with their assigned condition. Participants then rated a set of ten jokes on a likert-type scale as to how funny they found them. While listening to the jokes, we recorded their displays of mirth (e.g., laughing and smiling). To assess their mood, each participant filled out a Mood Adjective Checklist three times during the study: prior to being exposed to the Velton statements, prior to rating the jokes, and after rating the jokes. We hypothesize that our results will indicate that participants in the depressed condition will rate jokes as less funny and show fewer mirth responses than those in the neutral or elated conditions.

#### N4 THE EFFECTS OF SMOKING AND SMOKING CESSATION ON OLFACTORY SENSITIVITY.

Lissa D. Davis, Lycoming College

The causal relationship between cigarette smoking and olfactory sensitivity was examined. Other factors analyzed in correlation with olfaction were smoking cessation, gender, and menstrual cycle phase. Participants were Sensation & Perception and Experimental psychology students. All participants were administered a smoking history questionnaire prior to experimentation. Female participants were further surveyed about their menstrual cycles. Through the method of limits, glacial acetic acid, isobutyric acid, and 2-sec-butyl-cyclohexanone, were presented to each participant in five serial dilutions to obtain threshold values. Trials were randomized and starting points altered. An analysis of variance and t-tests were performed on the data. The results are discussed, as well as the implications of the data collected.

#### N5 EFFECT OF WORD COLOR ON RECOGNITION MEMORY USING SIGNAL DETECTION.

Frances M. Merz, Dr. Howard C. Berthold. Lycoming College

The relationship between word color and recognition memory using forced-choice signal detection was examined. Participants were 68 psychology students randomly assigned to either the experimental word color groups or the black word control group. Participants received a set of word cards with typed in either of two colors or black, and were asked to memorize words for two minutes. Five minutes later, participants picked which words were old from a pile of cards containing old and new words. Results of a one-way ANOVA showed no significance, but trends in the A and D means indicated differences in recognition accuracy between colored words that were consistent with previous research.

#### N6 THE INFLUENCE OF IDENTITY STYLE ON ALCOHOL CONSUMPTION AND SEXUAL ACTIVITY IN FIRST-YEAR COLLEGE STUDENTS

Andrew McClurg, Alison Mitchell, Nicole Berardo, Frank Patti, and Dr. Andrea S. White, Psychology Department, Ithaca College

As individuals adjust to college, identity development can help form the basis of healthy psychosocial behavior. Identity processes consolidate in first semester as individuals make decisions regarding alcohol and sexual activity. According to Berzonsky, three identity styles describe an individual's current identity development: diffuse/avoidant, normative, and informational. It has been demonstrated that lower identity status (diffuse/avoidant) is correlated with some problem behaviors, such as high alcohol consumption. As part of a larger study designed to gain a better understanding of identity styles and the behavior of college students, we measured the identity style, alcohol use and sexual activity of first-year college students during October and again in December of their first semester. We hypothesize that alcohol consumption and sexual behavior will be correlated with higher diffuse/avoidant identity style scores and predict that alcohol consumption will be positively correlated with sexual activity. We will also examine the changes in alcohol consumption from Time 1 to Time 2 and relate those changes to sexual behavior.



**N7 RELIGION AND ITS RELATIONSHIP TO NORMATIVE  
AND INFORMATIONAL IDENTITY STYLES IN FIRST-YEAR COLLEGE STUDENTS**  
Carroll Clark, Jessica Sharp, Bethany Boilard, Fabian Perez, and Dr.  
Andrea S. White, Psychology Department, Ithaca College

Religion is a major area in which individuals consider identity decisions. According to Berzonsky, three identity styles describe how individuals process self-relevant information: diffuse/avoidant, normative, and informational. As part of a larger study designed to gain a better understanding of identity and behavior of college students, we measured identity style, religion and religious interest in first-year college students during October and again in December of their first semester. We hypothesize that participants who did declare a religion will have higher normative style scores than those who did not declare a religion. We also expect that individuals who are interested in learning more about religion will have higher informational scores than those who are not interested in learning more about their religion. Finally, we will investigate whether individuals with higher normative scores will be more likely remain stable in their religious declaration over time, whereas individuals with higher informational scores are more likely to change their declaration from Time 1 to Time 2.

**N8 THE ROLE OF VASOPRESSIN IN ANXIETY-RELATED BEHAVIOR IN RATS**  
Katie Jungers, John Carroll University

Arginine vasopressin (AVP), a neuropeptide, was studied in connection with anxiety, measured by the elevated-plus maze apparatus. Plasma corticosterone was also used as a measure of stress in each animal. Two strains of rats, the Long Evans (LE) rat, which produces a normal amount of AVP, and the Brattleboro (DI) rat, a mutated strain that does not produce AVP, were placed on the elevated-plus maze for a 5-minute time period. Total time and entries on open arm, closed arm, and center square were recorded. For open arm entries, time was significant, strain was not significant, but there was an interaction between time and strain over the 5-minute period. Overall, the LE animals entered the open arm of the maze significantly more than the DI animals. However, during the first minute, the DI animals entered the open arm significantly more than the LE animals. This study suggests that AVP plays a role in anxiety-related behavior.

**N9 SEXUALLY FORCED VICTIMS HOSTILITY TOWARD MEN.**  
Siobhan L. Horton, Lycoming College

One of the most prevalent crimes on college campuses is rape (FBI, 1986). Several studies have explored the characteristics of rape victims but none have studied their attitudes towards men. The current study will explore whether sexually coerced women are more hostile in their attitudes toward men than women who have no experience with sexual coercion. Scores on the Attitudes Toward Males Scale (Stephan, Demitrakis, Yamada, & Clason, 2000) and a measure of sexual victimization (Koss, Gidycz, & Winiewski, 1987) will be obtained. Participants are female college students. They will be asked to fill out a survey packet containing the two scales. It is hypothesized that female rape victims will be more hostile in their attitudes towards males due to the traumatic effects of being forced to have sex.

N10 A STUDY OF THE TECHNIQUES OF AVOIDING AGGRESSION IN COLLEGE MEN AND WOMEN.

Karli Ecker, Lycoming College

In this study, I compared the techniques used to avoid aggression by men and women. A survey of previous research showed that, whereas aggression is commonly studied, techniques to avoid aggression are rarely explored. However, some have found that distraction, humor, empathy and mild sexual arousal all may decrease aggression (Baron, 1976, McDonald, 1988). In the current study, participants were asked to complete a questionnaire that contained seven questions constructed by the experimenter. These questions consisted of the following techniques to avoid aggression: humor, reasoning, distraction, meditation, deep breathing, confronting the situation, and turning to religion. Because research shows that men are more aggressive than women (Campbell, 1993), it was predicted that men would be less likely than women to use the techniques to try to avoid aggression.

N11 WILL MESSAGES ABOUT FAILED DIETS RE-INHIBIT DISINHIBITED RESTRAINED EATERS?

Amy M. Siegel and Laurence J. Nolan, Wagner College

Dietary restraint, the cognitive control of food intake in which many dieters engage, can be disinhibited when these subjects consume a food they perceive as being high calorie. While nonrestrained eaters will consume less food than controls after such a "preload," demonstrating caloric regulation, restrained eaters eat more. Efforts to re-establish control in these subjects by exposing them to messages about successful dieters produced even higher rates of consumption. In this study, after disinhibiting restrained eaters with a preload, we attempted to re-inhibit their eating by exposing them to scenarios describing dieters who repeatedly fail in their efforts to control body weight. The amount of food consumed and hunger, fullness, and hedonic ratings were among the dependent measures. The hypothesis remained untested, however, as the restrained eaters failed to demonstrate disinhibited eating in our laboratory.

N12 NO TITLE GIVEN

Laura E. Lebo, Lycoming College

The relationship of recognizing faces and illumination was examined. Participants were 30 undergraduate psychology students, 15 male and 15 female. Two groups viewed 60 faces for 5 minutes, Group 1 in a bright room and Group 2 in a dim room. 60 more faces were then mixed into the pile and they were asked to sort the faces into old and new piles. As predicted, the results of the study indicated that Group 1 in the bright room recognized significantly more faces than Group 2 in the dim room. The importance of further research, as well as other suggestions, were discussed in order to refine this experiment and make the results more accurate to support the population as a whole.

## SOCIOLOGY POSTER ABSTRACT

### N13 CRIME RATES VERSUS INCARCERATION RATES

Joseph Styles, Wagner College

This project examines whether the incarceration rate effects the crime rate. To determine this three separate and competing theories will be examined: the displacement/free rider effect, which supports the belief that the incarceration rate effects the crime rate. The selective/individual incapacitation theory, which also supports the notion that the incarceration rate effect the crime rate. Finally the differential deterability theory, which does not support the theory that incarceration rates effect the crime rate. Leading empirical studies will also be examined to determine where crime rates are effected by incarceration rates

## HEALTH SCIENCE POSTER ABSTRACTS

### N14 ASSESSMENT OF NEURONAL RESPONSIVENESS TO OXYTOCIN IN THE BED NUCLEI OF THE STRIA TERMINALIS USING FOS IMMUNOHISTOCHEMISTRY.

Chmielewski, J., Sannito, D., Salotti D. and Wilson, BC, Dept. of Biology, Sacred Heart University, Fairfield, CT.

The Bed Nuclei of the Stria Terminalis (BST) are part of the limbic system of the brain and are implicated in the control of neuroendocrine activity in late pregnant and lactating rats. During this period, the peptide oxytocin is known to suppress the neuroendocrine response to stress through actions at the BST. The timing of these actions is critically linked to the timing of birth and changing levels of gonadal steroids following luteolysis in the rat. To further assess the importance of steroid environment in the responsiveness of BST neurons to oxytocin, experiments were carried out using male rats to eliminate the potential influence of estrogen and progesterone on neuronal responses to oxytocin and responsiveness was assessed using Fos immunohistochemistry. Coronal brain slices containing the BST were obtained from male Sprague-Dawley rats and maintained in vitro using standard techniques. Following treatment with 1 micromolar oxytocin, slices were processed for Fos immunohistochemistry and Fos expression was compared with control slices that did not receive oxytocin treatment. Qualitatively, the number of Fos-immunoreactive cells was greater in the BST of oxytocin-treated slices compared with controls. Current experiments are quantifying this response and determining if responsiveness changes between different subnuclei of the BST. This study provides data which support the hypothesis that the BST in male rats is responsive to oxytocin and that this effect is not modulated by estrogen and progesterone.

**N15** CORRELATION BETWEEN HEART RATE AND SKIN TEMPERATURE CHANGES DURING  
ELICITATION OF RELAXATION RESPONSE: A PHYSIOLOGICAL STUDY

ParamPreet Ghuman<sup>1</sup>, Nathalie Saint Jean<sup>2</sup>, Georgia Koutsovasilis<sup>3</sup>, Susan Spalluto<sup>1</sup>, Michael Rotondo<sup>1</sup>, Zohreh Sahvar<sup>3\*</sup> and Zoltan Fulop<sup>1\*</sup>  
Departments of Biology<sup>1</sup>, Nursing<sup>2</sup> and Mathematics<sup>3</sup>, Wagner College,  
Staten Island NY, 10301 \*Faculty advisor

A growing body of evidence has documented that a person's state of mind can enhance or reduce resistance to infections, cancer and other malignancies. The use of certain meditation techniques leading to relaxation has been found to alleviate and reverse some illnesses, hence relaxation is generally accepted as an activity that may have therapeutic value. The physiological response that is elicited with the relaxation technique is referred to as relaxation response. The relaxation response is believed to be associated with physiological changes that may reduce the sympathetic, emergency reaction, fight or flight, and doing this may enhance the regenerative, parasympathetic influences.

The aim of this project was to study the correlation between two physiological parameters, the heart rate and the skin temperature of subjects during different phases of practicing relaxation. All procedures were performed in accordance with the Institutional Review Board Protocol issued by the Staten Island University Hospital. Each subject signed an Informed Consent.

Acknowledgements: This study was supported by the Mind/Body Institute of Harvard University, Medical School, Boston, MA.

**N16** THE EFFECTS OF VASOPRESSIN ON ETHANOL TOLERANCE AS EVIDENCED BY  
CIRCADIAN RHYTHMS OF ACTIVITY AND BODY TEMPERATURE

Kristen A. Yankura, John Carroll University

The relationship between ethanol tolerance and circadian rhythms of activity and body temperature in vasopressin-containing, Long-Evans (LE) and vasopressin-deficient, Brattleboro (DI) rats was examined. All animals were habituated under a fixed 12h light/12h dark cycle for 6 days. Following habituation, a biotelemetry transmitter, used to monitor general motor activity and body temperature, was inserted subcutaneously in each animal. After a rehabilitation period of 6 days, a sodium chloride solution was administered (3g/kg of body weight i.p.) for 6 days. Subsequently, ethanol (3g/kg dose of 20% w/vol i.p.) was administered for 14 days. This was followed by a second administration of the sodium chloride vehicle for 6 days. The introduction of ethanol disrupted both DI and LE circadian temperature rhythms; however, LE animals were more successful in recovering from this disturbance. Additionally, DI animals lost the 12h circadian activity rhythm upon administration of ethanol, while the LE animals were able to maintain a regular rhythm throughout ethanol administration. In addition, both DI and LE animals exhibited a reactive hyperthermic response followed by hypothermic symptoms of withdrawal upon the reintroduction of administration of the sodium chloride vehicle. Since the primary difference between DI and LE animals is their ability to synthesize vasopressin, these findings suggest that vasopressin may play a role in the development of tolerance. This experiment, then, can serve as a basis for future research that aims to elucidate the role of vasopressin in tolerance and apply that knowledge to models of alcoholism.

## CHEMISTRY POSTER ABSTRACTS

### N17 DEVELOPMENT OF A Ru-BASED SENSOR FOR DETECTION OF NITRIC OXIDE

Derek Warner, Rose Clark, Saint Francis University, Loretto, PA

The free radical nitric oxide has been found to play vital roles in the human immune system, the dilation of blood vessels, and as a neurotransmitter. As a result of these recent findings, new, more sensitive detection methods are in high demand. The currently available electrochemical sensors for NO detection are glassy carbon electrodes coated with nickel porphyrin (Ni-TMHPP). However, in a recent study, a solid ruthenium electrode was found to be more than twice as sensitive to NO than nickel coated porphyrin. Due to the high cost of ruthenium, we are attempting to create a ruthenium deposited electrode with the same sensitivity as a solid metal ruthenium electrode. By following a deposition method similar to that used in insulin detection, Ru can be deposited on to the surface of a glassy carbon electrode. Presently, focus is in the cell design stage, as a calibration curve cannot be obtained due to the formation of NO bubbles on the electrode surface and high noise levels.

### N18 INVESTIGATIONS IN SUPERCRITICAL FLUID REACTION CHEMISTRY:

SYNTHESIS IN A NON-TRADITIONAL MEDIUM

Matthew Couture, Christopher Suznovich, and James Louey

Department of Chemistry, Sacred Heart University, Fairfield, CT 06432

As we move into the 21st Century, the chemical industry is under increasing pressure and scrutiny to develop cleaner and greener technologies. Supercritical fluids (such as carbon dioxide) are emerging as environmentally attractive alternatives for a number of synthetic organic reaction processes. Working in the supercritical medium presents a number of constraints including temperature, pressure, and solubility. We are currently adapting this solvent medium to the Diels-Alder cycloaddition reaction and the Baeyer-Villiger oxidation reaction. Results of our work will be presented.

### N19 OIL OF CATNIP BY SUPERCRITICAL FLUID EXTRACTION

Nathan Petersen, Dennis Salotti, Heather Shaeffer, and James Louey

Department of Chemistry, Sacred Heart University, Fairfield, CT 06432

Supercritical fluids and in particular supercritical fluid carbon dioxide have shown to be a viable technology for a variety of extractions. While process conditions require high pressures, technological advances have now made it feasible to acquire such equipment for the undergraduate laboratory. Traditionally, the oil of catnip has been isolated by steam distillation. Working with dried plant material, we have introduced supercritical fluid carbon dioxide as an alternative extraction medium. Results of our work including characterization of the major constituent components will be presented.

## N20 SOLID PHASE DIVERGENT SYNTHESIS OF POLYURETHANE DENDRONS

Stephanie Brousseau and Richard Taylor  
Providence College and Miami University

Dendrimers are symmetrical, highly-ordered macromolecules whose shape, size, flexibility, polarity, and solubility can be controlled by choices in the repeating unit chosen for constructing the generations and in the functional groups selected for the periphery. Dendrimers with a variety of shapes, properties, and applications can also be synthesized by choosing various types of central molecules. Two main synthetic strategies, divergent and convergent, are used to construct dendrimers. The dendritic synthesis is started at the initiator core and branched out to the periphery in the divergent approach. In the convergent approach, construction begins from what will be the periphery of the molecule. Previous research has led to a good convergent synthesis of polyurethane dendrons. However, variation of the periphery is difficult using this approach, since the peripheral groups are introduced in the first step. Summer research had focused on the solid phase divergent synthesis of similar polyurethane dendrons. Using this synthetic method allows for choosing peripheral groups at any step. Additionally, robotic synthesis of these dendrimers could create a library of dendrimers with different spacer chains and peripheral groups.

## N21 STUDYING THE THERMAL DECOMPOSITION PRODUCTS AND KINETICS OF HMX

(OCTAHYDRO-1,3,5,7-TETRANITRO-1,3,5,7-TETRAZOCINE)

Andrew J. Dial and Pete Lofy\*

United States Military Academy at West Point, NY 10996

The decomposition of HMX is studied using thermal analysis techniques, Fourier-Transform infrared (FTIR) spectroscopy and mass spectrometry (QMS). The data from the thermal analysis was analyzed using the isoconversional analysis technique. This technique uses a model-free method to determine kinetic parameters associated with the thermal decomposition of HMX, namely the activation energy (EA) and the Arrhenius pre-exponential factor (A). The products of the decomposition of HMX were further studied using TGA-FTIR and QMS.

## BIOCHEMISTRY

### N22 CONTAMINATION OF SOIL WITH PARASITE OVA ON THE WEST POINT MILITARY RESERVATION

Amy Woodell, United States Military Academy

A study was undertaken to assess the presence of parasite ova in soil samples collected on the West Point military reservation. With the goal of assessing if children at West Point are at risk of acquiring a parasitic infection, sampling was conducted in residential areas, playgrounds, and other locations frequented by both pets and children. Three sites were tested on a tri-weekly basis and two alternative sites were tested randomly. Between 11 October 2000 and 12 December 2000, 41 soil and fecal samples were collected from these locations, concentrated by zinc sulfate-flotation, and examined by brightfield microscopy for *Toxocaris*, *Ascaris*, *Trichurus*, hookworms, and tapeworms. These nematode species were selected based on their historical prevalence in the local community. Results of testing included 1 finding of *Toxocaris* (2.4% of total study population) and 2 findings of hookworm (4.9% of total study population). These results suggest that positive soil samples result from animals depositing feces into the environment. They are also suggestive, but not conclusive, of a relationship between parasite positive feces and parasite positive soil. Information from the local community suggested a chronic history of pet defecation in the areas that sampled positive for nematode ova. Since children frequent the locations in which positive samples were found, it is reasonable to suggest that they may be at risk for infection. This risk emphasizes the importance of limiting the number of strays, responsible pet ownership to include deworming, and prompt removal of pet feces from public locations.

### N23 THE EFFECTS OF CANTHARIDIN ANALOGUES ON CANCER CELLS

MEASURED BY THE MTT ASSAY

Jeremy Killion<sup>1</sup>, Sharmini Santher<sup>2</sup>, Robert S. Greene<sup>2</sup>, and Mary P. McCourt<sup>1</sup>

<sup>1</sup>Department of Chemistry and Biochemistry, Niagara University, Niagara University, NY 14109

<sup>2</sup>Department of Biology, Niagara University, Niagara University, NY 14109

Cantharidin is known to inhibit protein phosphatase 2A (PP2A) and plays a role in cell growth and cell death. Newly synthesized analogues, of the parent cantharidin, will be tested to measure their ability to cause cell death in cancer cells. These analogues, synthesized at Niagara University, are bicyclic [2.2.1] and [2.2.2] systems that have varying conformations and elements (C, N, O). Cell lines such as HL60, HepG2 and RIF will be grown in culture and used to test the newly synthesized compounds. The MTT assay, a spectrophotometric assay will be used. The data will be measured using a scanning microplate spectrophotometer at a wavelength of 570nm. The MTT assay will provide data that quantifies the percentage of living cells.

N24 RESIDUE BASED, FOUR-BODY LIKELIHOOD POTENTIALS REVEAL PROTEIN-SPECIFIC CORRELATIONS WITH STABILITY CHANGES CAUSED BY HYDROPHOBIC CORE MUTATIONS.  
Brendan C. LeFebvre, Stephen A. Cammer, Charles W. Carter, Jr.,  
Alexander Tropsha, Marshall Hall Edgell.  
Providence College and The University of North Carolina at Chapel Hill.

Delaunay tessellation has been applied to protein structures in order to represent the domain of three-dimensional residue interactions with a finite set of elementary motifs. Each motif consists of a set of four nearest-neighbor residues, considered independently of their order in the linear polypeptide sequence.

We show that these motifs appear to hold some predictive power with regard to the effects of hydrophobic core mutations on a protein's free energy of unfolding. For every protein structure investigated, we measured a "3-D profile," a summation of the statistical potentials of the Delaunay motifs involved in that particular structure. We then performed "virtual mutagenesis" experiments on these proteins by changing a residue's identity in the tessellated model of the given protein and remeasuring the 3-D profile.

In a linear correlation of the published change in free energy versus our measured change in 3-D profile for a given set of mutations,  $R^2$  values as high as 0.86 have been achieved. We consider the limitations of the statistical model as it presently exists and suggest avenues for future work to refine it.

## PHYSIOLOGY

N25 THE EFFECTS OF CHOLINERGIC AND ADRENERGIC AGENTS ON THE CONTRACTIONS OF RAT UTERINE MUSCLE  
Roberta M. Kelly and Ingrid Carballo (sponsor Carl S. Hoegler)  
Marymount College, Tarrytown, N.Y.

This research investigates the effectiveness of parasympathomimetic and sympathomimetic compounds on rat uterine smooth muscle contraction by examining the responses to a variety of representative agonists and antagonists. Uterine horns, obtained from anaesthetized CD virgin rats were incubated in a muscle bath of aerated 37°C Tryode's solution (pH 7.6). Exposure of the uterus to certain agents might cause an alteration in the rhythmicity of phasic contractions and/or an increase sustained tension (tonicity). Alternatively, the uterus can be tensed (sustained tonic contraction) with 25mM KCl and challenged with suspected relaxing agents. Cholinergic agents such as acetylcholine (10-5M), caused increases in tonicity, complemented with an increase in the rate of phasic contraction. Eserine (10-5M) appeared to prolong tonic contractions to acetylcholine, suggesting that acetylcholinesterase was present and inhibited. Atropine (3.8X10-8M) blocked the uterine response to acetylcholine, suggesting that it is a muscarinic agent; the muscle was still responsive to oxytocin (10-8M). The muscle was not responsive to pilocarpine. Epinephrine (10-6M), isoproterenol(10-6M), both beta-adrenergic agents and phenylephrine (5x10-6M), an alpha1-adrenergic agent relaxed uterine smooth muscle, tensed with KCl. Propranolol (10-6M) partially inhibited but did not block epinephrine, but had no effect on isoproterenol. Phentolamine (alpha1- and alpha2-adrenergic antagonist) also had no effect.



**N26** INTRAVASCULAR PRESSURE DISTRIBUTION IN THE HAMSTER UTERO-OVARIAN VASCULAR NETWORK. T.E. Sweeney J. Cron, F.N. Grisafi and E.M. Pauli. University of Scranton, Scranton, PA 18510.

The purpose of this study was to determine the intravascular pressure profile of the hamster utero-ovarian vascular network. We report results of the initial phase of this study, which focused primarily on uterine and ovarian resistance arteries. The right ovary and cranial aspect of the uterus in eleven sexually mature female golden hamsters (Nembutal; 70 mg/kg, i.p.) was exposed for microcirculatory observations. Using a servo-null transducer, twenty-nine intravascular pressure measurements were made in the resistance arteries and veins of the utero-ovarian network. Vascular architecture and vessel diameters were also quantified by videomicroscopy. The pressure profile showed that a large proportion of the total ovarian vascular resistance lies within the utero-ovarian feed arteries. As the data set enlarges, day-specific trends are beginning to emerge. On two days of the hamster's 4-day estrous cycle, arterial pressure dropped below 60 percent of systemic arterial pressure before the feed arteries entered the ovary. This indicates that 40 percent of the total ovarian vascular resistance is due to the feed arteries. Architectural and vessel diameter data showed that the bulk of this pressure drop occurred within 6000  $\mu$ m of the entry point of the arteries into the ovary, due to a two- to four-fold drop in arterial diameter and a high degree of coiling both in the ovarian artery and in the ovarian arterial feed arising from the uterine artery. These arteries were capable of large, dynamic changes in diameter, exemplified by occasional responses to mechanical stimulation. The data support our hypothesis that resistance arteries play an important role in regulating ovarian blood flow amplitude and further our investigation of estrous cycle-dependent changes in utero-ovarian blood flow amplitude and distribution. (Supported by The University of Scranton.)

**N27** PHASIC AND TONIC CONTRACTIONS IN RAT UTERINE MUSCLE  
Ingrid Carballo and Roberta Kelly (Carl S. Hoegler, sponsor)  
Marymount College, Tarrytown, New York

This research investigates the value of the rat uterine muscle as a model for physiological study in the laboratory. Two uterine horns (obtained from each anaesthetized CD virgin rat) were incubated in a muscle bath of aerated 37°C Tyrode's solution (pH 7.6). The 2 horns of isolated uterine muscle contract rhythmically (phasic contractions) during different stages of the estrus cycle (pro-estrus, estrus and diestrus). Initial phasic recordings ranged from 0.5-2.14 cycles per minutes (minHertz). Tension of these contractions ranged from 0.7 to 2.71g and appeared to increase over the entire 5-6 hour recording period. Anoxia slows, then inhibits the phasic rate, suggesting oxidative metabolism underlies energy requirement; calcium-free Tyrode's also blocks phasic contractions. Low pH (6.23 and 7.1) increases both tension and rate of phasic contractions, suggesting an adaptation to increase circulation. Oxytocin ( $2.5 \times 10^{-9}$ -  $10^{-8}$ M) causes a sustained increase in uterine tension (tonic contraction) complemented by an increase in phasic rate. Acetylcholine ( $5.5 \times 10^{-5}$ M), a cholinergic agent, also increased tonic contraction of uterus. On the other hand, epinephrine ( $10^{-6}$ M), an adrenergic agent relaxed precontracted (with 25mM KCl) uterine muscle. Barium chloride, but not calcium chloride caused an increase in contraction. Caffeine (100 $\mu$ M) had no direct effect on the uterine contractions. We conclude that uterine muscle provides an excellent preparation to study smooth muscle contractions over a long period of time.

N28 POPULATION AND SYNTHESIS OF GLYCOSAMINOGLYCANS IN MITRAL VALVE  
INTERSTITIAL CELL CULTURE  
Julie Ann Corcoran, John Carroll University

Previous biochemical analysis of tissues has shown two distinct features of the mitral valve. First, there was an altered glycosaminoglycan concentration between normal and diseased valves. Diseased valves have shown an increase in the concentration of glycosaminoglycans. Second, the increase has specifically been seen in particular glycosaminoglycans, thereby disrupting the overall distribution pattern of glycosaminoglycans that existed in the normal mitral valve. In addition to these findings, it has been seen through further biochemical analysis that there was a difference in the normal distribution pattern of glycosaminoglycans between mitral valve leaflets and mitral valve chordae. By closely studying the mitral valve, we hoped to determine whether the cells in the diseased valves were abnormal. We wanted to see if the glycosaminoglycans concentrations were changed, whether the overall distribution of glycosaminoglycans produced by the cell were affected, and whether there was a difference between leaflet cells and chordal cells. In addition, we wanted to find out if cell culture was an adequate way to explore these differences.

ECOLOGY and ENVIROMENTAL SCIENCE

N29 DETERMINATION OF WASTE ASH  
William Bezts, Wilkes University

A major waste from coal-burning utilities is the ash as a result of the combustion of coal to create the steam to power the turbines. This project goal is to determine waste ash hazardous properties on crop plants. This project is conducted in conjunction with other students at Bryant College, RI. There, the crops are planted in mixtures of sand or topsoil with ash. The plant's resultant growth should reflect the harm or benefit given to them by the ash mixed in the topsoil or sand. The part of the project conducted at Wilkes University is to characterize the physical properties of the various sand/ash and soil/ash mixtures. The particle size distribution, porosity, and loss on ignition (LOI) values and their relevance to the project will be presented.

### N30 GROWTH DYNAMICS IN THE DINOFLAGELLATE PERIDINIUM

Shannon M. Slowey, Saint Francis University

Dinoflagellates are microscopic organisms known to rapidly proliferate, causing red tides. The same dinoflagellates produce toxins that often cause death in filter feeding shellfish and other marine species. Current research speculates that runoff from the land, which could consist of sewage and fertilizers, is the cause of the rapid blooms of dinoflagellates. The dinoflagellate, *Peridinium*, was selected for use as an experimental organism. In order to simulate fertilizer runoff, known solutions of fertilizer (Miracle Grow) were added to experimental flasks containing solutions of media and *Peridinium*. Twelve flasks were used in all, three for each concentration including the control group. Growth rates were determined by counting live cells using a hemacytometer. It was hypothesized that the solutions with the highest concentration of fertilizer would experience rapid growth rates or "blooms."

The results were inconsistent with the hypothesis, showing that growth rates of *Peridinium* were random. Growth rates in trial one were highly variable, giving high standard deviations, thus showing non-significant differences between control and experimental flasks. Trials two and three had less deviation, possibly do to improved experimental and counting techniques. Although lower standard deviations were recorded in the subsequent trials, there was no conclusive evidence to suggest that added fertilizer effected growth rates of the dinoflagellate *Peridinium*.

### N31 GROWTH AND PERSISTENCE OF BACTERIA IN SEDIMENT SAMPLES

Wojciech Franzl and Walter W. Faber Jr., Ph.D.

Department of Biology, Manhattan College/College of Mt. St. Vincent,  
Riverdale, NY

Current recreational water monitoring focuses on the microbiological quality of the water column and does not include the sediments. Swimmers, by virtue of wading into the water, stir up sediments. If pathogens persist in the sediments, then the swimmers may be at an increased risk of exposure, which may not be revealed in the results of water analyses. This study will begin to investigate the accumulation, growth and persistence of pathogens in shore sediments. Sediment samples were collected in the field, and autoclaved to inactivate any naturally-occurring bacteria. A layer of sterile deionized water was placed over the sediments. Either *Escherichia coli* or *Enterococcus faecalis* were inoculated into the sediments. At various time intervals, aliquots of the sediment and overlying water were tested for bacterial count using the membrane filtration technique, and for total protein using the modified Lowry. Preliminary results will be presented.

### N32 LICHEN RECOVERY IN THE STATE OF CONNECTICUT

Matthew Widlak & Dr. Barbera Nicholson  
Department of Biological Sciences, Central Connecticut State University.

In 1980, Kenneth Metzler mapped the distribution of lichens in Connecticut and correlated the abundance to atmospheric pollution levels. The goal of this study was to re-investigate lichen distribution in the state and determine if lichens had recovered in response to a decline in Sulfur Dioxide (SO<sub>2</sub>) emissions. The study was conducted in the central lowlands and northern upland regions of Connecticut on the eastern side of the state. This region represents a transect from the areas ranging from the most to least polluted areas found in the Metzler study. U.S. Geological Survey 7.5' quadrangles were used to map the study. Each 7.5' quadrangle was divided into four equal quadrants. Within each quadrant, five black or red oaks (*Quercus rubra* and *Quercus velutina*) with an average diameter of 50cm and at least 50 meters from any road were selected as close to the center of the quadrants as possible. Coverage of lichens on each tree was calculated by determining percent estimates between 50cm and 75cm from the base of the tree. Results show the average percent coverage of lichens has increased from west to east direction and an increase of number of foliose lichen species in the west. This study demonstrates that lichens have recovered both in terms of abundance and species diversity.

### N33 MEASUREMENT OF RADON LEVELS ON A COLLEGE CAMPUS

Joseph Bopp, Linsey O'Donnell, Rebecca Snavelly, Jelena Petrovic,  
Daniel Solomon, Haley Hawk, Edward P. Zovinka, Saint Francis University

We undertook a study of the amount of radon gas present in Saint Francis University residence halls and academic buildings. We have combined this year's data with that of the data from 1999 and 1997. The previous years' data indicated that the radon levels in certain academic buildings were above that of the accepted value determined by the EPA of 4pCi/L. The radon levels in the residence halls were unknown, which provided the basis for our current project. We will present our complete campus radon profile.

### N34 OLFACTION, INDIVIDUAL RECOGNITION, AND THE SOCIAL ORGANIZATION OF MALE SIAMESE FIGHTING FISH (*Betta splendens*)

Julio Mendez, Sue Gencarelli and Dan Albrecht, Sacred Heart University

In many animals, territorial owners respond less aggressively to intrusion by an established neighbor than by a non-neighbor. This difference in intensity of territory owners' responses has been termed the dear-enemy phenomenon, and it is an important component of the social organization of territorial species. This phenomenon has been observed in a wide variety of vertebrates, and the cues used for discriminating between neighbors and strangers are typically visual and/or acoustic. Male Siamese fighting fish are territorial and highly aggressive, but they tend to live in cloudy, brackish water in which visual identification of individual conspecifics may not be possible. We tested whether territorial males of this species can distinguish among conspecifics based on chemical cues alone. We simulated territorial intrusions by placing a mirror in front of a territorial male while we simultaneously added water taken from another male's tank. We did this for four consecutive days and observed a significant decrease in subjects' aggressive responses. On the fifth day, intrusion by a new male was simulated when we added water from the tank of a different male to the subject's tank. Under these circumstances, subjects responded with high levels of aggression, suggesting that chemicals in the water influenced the response. We propose that chemical recognition of individuals might be important in the social organization of male Siamese fighting fish.

### N35 VIRUSES IN THE HUDSON RIVER: INDICATORS OF WATER QUALITY?

Kathryn Docherty, Lynne Leach and Raymond Kepner, Jr.  
Marist College, Poughkeepsie, NY 12601

This research focused on the enumeration of total and infective viruses from the Hudson River and select tributaries. Techniques for direct enumeration of total viruses included epifluorescence microscopy (EMC) and transmission electron microscopy (TEM). Detection of coliform bacteria and coliphage (viruses that infect coliform bacteria), organisms of concern for human health reasons, were done using USEPA protocols. Water samples were collected during June, July and August, 2000 from sites along the Saw Kill, Stony Creek, the Hudson River National Estuarine Research Reserve (HRNERR) at Tivoli Bays, a mid-river site near the the Kingston-Rhinecliff Bridge, and from the Hudson River near Marist College. Samples from Saw Kill sites were analyzed for correlations between microbial and nutrient indicators of septic pollution, and no significant positive correlations were found. Viable coliform, E. coli and coliphage viruses were present at every site studied. Total bacteria were found to be  $1.4 \times 10^{-4}$  coliforms and  $2.4 \times 10^{-6}$  E.coli. Total viruses were found to contain  $5.7 \times 10^{-6}$  % E.coli strain C-infecting phage. On average, approximately 3 infective coliphage were found for every E. coli cell present, and about 5 % of bacterial cells were infected with lytic bacteriophage. This research provides a baseline for the study of the effects of viruses on bacterial populations, which are important carbon sources and transformers in the Hudson River ecosystem. The study also adds to our knowledge of coliform bacteria and coliphage of potential human origin in the Hudson drainage.

### N36 NO TITLE GIVEN

Brenda M. Wheeler, Saint Francis University

This experiment examined short-term toxicity of sodium dodecyl sulfate (SDS) on the fathead minnow, *Pimephales promelas*. The method used for introducing SDS into the system was a non-renewal toxicity test. The test was performed over a five-day period at different concentrations. The effects of pH, dissolved oxygen, and temperature were maintained at approximately normal conditions. Data was collected over multiple weeks with eight total trials. Survival and weight were both used as endpoint measurements. Data is inconclusive as to which concentration of SDS is maximum sublethal.

## PHYSICS POSTER ABSTRACT

### N37 COMPLEX IMPEDANCE STUDIES OF OPTICALLY STIMULATED STRONTIUM BARIUM NIOBATE

Peter G. Brereton, Charles A. Edmondson and Steven R. Montgomery  
Physics Department, U.S. Naval Academy, Annapolis, MD 21402

The complex permittivity and impedance of strontium barium niobate (pure and cerium doped) were measured with a computer interfaced impedance analyzer over a frequency range spanning twelve orders of magnitude (microhertz to megahertz). The thin planar crystal samples were placed between the plates of a modified parallel plate capacitor and illuminated on the side with an argon-ion laser. Baseline impedance spectra were obtained for both crystals in the dark at room temperature and compared to spectra obtained during illumination. The dielectric changes associated with illumination and doping are discussed.

# Conference Attendees

School Name	Name	Session Abstract
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Central Connecticut State University

## Faculty

Michael Davis	M34, M35
Sylvia Halkin	M18
Martin Kapper	
Thomas King	M5, M28, M29, M30
Kathy Martin-Troy	M17
James Mulrooney	
Barbara Nicholson	N32
David Spector	
Cheryl Watson	E4

## Students

Eneze Abugunde	M28
George Akkouris	
Summer Armack	
Tammy Bagdigian	
Susana Barraza	
Jason Belejack	
Peter Berry	M29
Rebecca Bors	
Joseph Carpentino	M29
Denise Castonguay	M28, M29
Darius Charles	
Rachel Chrissluis	M28
Lisa D'Ascanio	
Charlene Delesline	M5
Mia Devery	
Matthew Driscoll	
Abigal Duchatelier	
Brandon Elliot	
Omari Giscombe	
Katja Gist	M5, M29
Christine Hany	
Cheryl Jarrow	
Joanna Jeruzal	M28
Douglas Kablik	
Roy Keech	E2
Emilie Kidder	
John Kouch	
Izabela Krakowiak	M30
Kristi Lamonica	E4
Angela Laroche	
Jeannette Loman	M28, M29, M30
Tangi Mitchell	
Stephen Ouellette	
Roberto Padua	
Sara Patterson	M28
Lori Pazameta	
Anja Pennell	
Chistine Pietrowicz	
Dennis Quinn	E4

School Name	Name	Session Abstract
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Central Connecticut State University (cont d)

Tammie Repass	
Ruth Rollin	M5
Dan Rouillard	
Melissa Sargent	
Victor Senat	
Kelly Shanley	
Rashmi Sharma	
Konrad Sliwinski	
Thomas Stoklasek	
David Stowe	
Kim Swan	
Timothy Throgmorton	
Amanda Valden	
Natalie Venter	
Jessica Wearne	
Matthew Widlak	N32
Marissa Wright	

College of Our Lady of the Elms

Faculty

Mary L. Wright

Students

Nicole Brunelle	
Nicole K. Bruni	M14
Lucy Francisco	M16
Brooke Ramah	M16
Tara A. Shea	M13
Rachael Visconti	E8

Ithaca College

Faculty

Nancy Rader	D4
Cyndy Scheibe	
Andrea White	H5, N6, N7

Student

Lana Bodach	D4
Bethany Boilard	N7
Knick Cadmus	D3
Courtney Campbell	D1
Jason Carney	D2
Carroll Clark	N7
Christian Fisher	D3
Travis Fullem	I4
Natalie Hodges	D3
Jackie Martin	N3
Andrew McClurg	H5, N6
Brendan McCorkle	D1
Susan McGaffick	N3

School Name	Name	Session Abstract
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Ithaca College (cont d)

Allison Mitchell	N6
Gail Moore	H5
Aimee Nicholas	H5
Laurence Parker	
Frank Patti	N6
Fabian Perez	N7
Michelle Pidluski	D4
Heather Porter	D5
Kelly Rosekrans	D2
Bettina Schimanski	A1
Jessica Sharp	N7
Jen Tausig	D1
Jessica Vinluan	D2
Dan Weiss	D1

Guests

Craig Bender	
Ariana Carvell	
Alyssa DeVilliers	

John Carroll University

Faculty

Helen M. Murphy	
Cyrilla H. Wideman	

Students

Stacey Brand	M31
Allison Brown	M10
Julie Ann Corcoran	N28
Katie Jungers	N8
Kristen A. Yankura	N16

Lycoming College

Faculty

Holly Bendorf	C1
Howard Berthold	H2
Kathy Ryan	

Students

Garrett Boop	H3
Jessica D'Achille	N1
Lissa Davis	N4
Jessica DeDay	H4
Elizabeth Dixon	C1
Karli Ecker	N10
Amanda Gezes-Kowiak	H7
Todd Harry	H1
Siobhan Horton	N9
Beth Hurt	
Lauro Lebo	N12
Shauna McQuillen	D6
Frances Merz	N5
Amanda Messina	H6
Cheryl Padden	H2



School Name	Name	Session Abstract
Manhattan College		
Faculty	Lance S. Evans	
	Jim Haley	
	Michael Judge	
	Bill Tramontano	B5
Students	Renee Baranin	F5
	Danielle Capelli	E3
	Richard Carlino	
	Mary DiMiceli	B5
	Rawan Fanek	B4
	Wojceich Franzl	N31
	Karen LaGrazon	E7
	Janet Maltez	
	Michelle Maxson	F4
	Deborah Nunziata	E9
	Jacklyn Pancrudo	B1
	Rocio Perez	
	Shereene Rabadi	B4
Marist College		
Faculty	Raymond Kepner, Jr.	N35
	Rob Balogh-Robinson	
	Zofia Gagnon	B2
	Michael Tannenbaum	
Students	Kathryn Docherty	N35
	Dana Felice	B2
	Jeremy Koscielecki	C5
	Martine Mirrione	B2
	Lucas Tucker	C5
Marymount College		
Faculty	Carl Hoegler	N25, N27
Students	Ingrid Carballo	N25, N27
	Robertta Kelly	N25, N27
Monmouth University		
Faculty	Louis J. Kijewski	I5
	Masayuki Shibata	
	Peter Wepplo	
	Theresa Julia Zielinski	
Students	Nancy Santagata	
	Sindia Sosdian	I5

School Name	Name	Session Abstract
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Montgomery College

Faculty

Linda Mona

Niagara University

Faculty

Mark A. Gallo	M3, M6, M7
Robert S. Greene	M2, M19, N23
Michael A. Kotarski	F6, M27, M32, M36
Mary McCourt	N23
Carol R. Sweeney	

Secretary

Connie Guthrie

Students

Florence Breslin	M27
Mary Chlebowski	C4
Ray Delucci	M2
Chris Desimone	M2
Matthew Fernaays	M7
Jason Flint	F6
Ruth Freeburg	M19
Michelle Good	M2
Tom Holovics	C4
Jessica Kajfasz	M6
Jeremy Killion	N23
Jamie Krell	M32
Dinesh Krishnamurthy	
Stacy Lockhart	M3
Heather Lynch	M6
Sharmini Santher	N23
Andrew Schlemper	
Becky Swinton	M36
Amy Turnbull	
John Varga	M7
Ryan Wormuth	

Providence College

Faculty

James F. Belliveau  
K. Cornely

Student

Stephanie Brousseau	N20
Danielle Novak	E5
Kristy Whitman	G2

Presenter Not Given N24

School Name	Name	Session Abstract
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### Sacred Heart University

#### Faculty

Danielle Albrecht	N34
Shannon Brightman	
James Louey	N18, N19
Marlina Slamet	
Brian Wilson	N14

#### Students

John Chmielewski	N14
Lindsey Cooper	F1
Matthew Couture	N18
Julio Mendez	N34
Nathan Petersen	N19
Dennis Salotti	N14, N19
Daniel Sannito	N14
Brian Skehan	F1
Christopher Suznovich	N18

### St. Francis University

#### Faculty

Rose Ann Clark	N17
Pedro Moi-o	
Sue Reimer	M12

#### Students

Joe Bopp	N33
James Gides	M12
Shanna Hall	M11
Jason Krahnke	M33
Linsey O'Donnell	N33
Jelena Petrovic	N33
Shannon Slowey	N30
Becky Snavelly	N33
Derek Warner	N17
Brenda M. Wheeler	N36

### SUNY Fredonia

#### Faculty

Theodore Lee	F2, F3, M26
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#### Students

Matthew Aboudara	M21
Randy Clower	M1
Ben Dickerman	M26
Matthew Johnson	F2
Tim Johnson	G1
Christina Stancato	F3

School Name	Name	Session Abstract
United States Military Academy		
Faculty		
	John Forney	
	John M. Ingram	
	Peter Lofy	N21
Students		
	Andrew Dial	N21
	James Nicholson	
	Amy Woodell	N22
United States Naval Academy		
Faculty		
	JudithAnn R. Hartman	C2
	George Piper	A3
Students		
	John M. Childs	C3
	Amanda L. Kammier	C2
	Stephen M. Long	A3
	Presenter Not Given	N37
University of Scranton		
Faculty		
	Terrence E. Sweeney	N26
Students		
	Jocelyn Cron	N26
	Frank Grisati	N26
Wagner College		
Faculty		
	Mohammad Alauddin	C6
	Kathleen Bobbitt	
	Geoffrey Church	
	Gregory Falabella	I6, I7
	Zoltan Flp	E1, E6, M23, N15
	Laurence Nolan	
	Linda Raths	
	Otto Raths	
	Zohreh Shahvar	
	Donald E. Stearns	
Students		
	Michael Brady	I2
	Grace Cacucciolo	M23
	Steven Corn	I7
	Carissa Creedan	N2
	Jennifer D'Amato	C6
	John DiClerico	E6
	Daniel Fazzino	
	Margaret Fioscanaro	M23
	Parampreet Ghuman	E1, I1, N15
	Gerald Guzman	
	Peter Herbst	I6

School Name	Name	Session Abstract
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Wagner College (cont d)

	Tom Hopkins	M24
	Sahani C. Howie	
	Angelica Iannone	
	Robert Khouri	
	Georgia Koutsovasilis	
	Jacqueline Nguyen	
	Nneka A. Orianwah	
	Michael Rotondo	
	Cathia Saint Jean	
	Nathalie Saint Jean	
	Randye Shanfeld	
	Joan Sheier	
	Amy Siegel	
	Jillien Soranno	
	Susan Spalluto	
	Joseph Styles	
	RenTe Sudol	
	Lisa Whalen	

Wesleyan University

Students

	Presenter Not Given	M25
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Wilkes University

Faculty

	Anthony Kapolka	A2
	Barbara Nostrand	A4
	Kenneth Pidcock	M15
	Michael Steele	M8, M9
	William Terzaghi	M4, M8, M9
	Brian Whitman	A5

Students

	Richard Ali	B3
	Milos Barjaktarovic	A2
	William Bezts	N29
	Zina Capute	M15
	Kevin Frank	A5
	Bernard Graham	A4
	Wesley Konsavage	M15
	Jennifer Lewis	M4
	Del Lucent	M4, M8
	Sonya Smereczynsky	M15
	Jeff Ward	M9

William Paterson University

Faculty

	Claire Leonard	B6
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Students

	Lakisha Mays	B6
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1994: Duquesne University, Pittsburgh, PA  
1993: Central Connecticut State University, New Britain, CT  
1992: United States Naval Academy, Annapolis, MD  
1991: SUNY at Fredonia, Fredonia, NY  
1990: Manhattan College, New York, NY  
1989: U.S. Military Academy, West Point, NY  
1988: Ithaca College, Ithaca, NY  
1987: Lycoming College, Williamsport, PA  
1986: Duquesne University, Pittsburgh, PA  
1985: SUNY at Fredonia, Fredonia, NY  
1984: Providence College, Providence, RI  
1983: Wilkes College, Wilkes-Barre, PA  
1982: Lycoming College, Williamsport, PA  
1981: Jersey City State College, Jersey City, NJ  
1980: SUNY at Cortland, Cortland, NY  
1979: Wilson College, Chambersburg, PA  
1978: Union College, Schenectady, NY  
1977: Fairleigh Dickenson University, Rutherford, NJ  
1976: Rhode Island College, Providence, RI  
1975: Widener College, Chester, PA  
1974: Worcester Polytechnic Institute, Worcester, MA  
1973: Pennsylvania State University, University Park, PA  
1972: U.S. Military Academy, West Point, NY  
1971: Rosary Hill College, Buffalo, NY  
1970: Wilkes College, Wilkes-Barre, PA  
1969: Yale University, New Haven, CT  
1968: Yale University, New Haven, CT  
1967: Fordham University, New York, NY  
1966: D.C. Teacher's College, Washington, DC  
1965: Danbury State College, Danbury, CT  
1964: Jersey City State College, Jersey City, NJ  
1963: Boston University, Chestnut Hill, MA  
1962: North Carolina State College, Raleigh, NC  
1961: SUNY College of Forestry, Syracuse, NY  
1960: Hunter College, New York, NY  
1959: Suffolk University, Boston, MA  
1958: Wilkes College, Wilkes-Barre, PA  
1957: Georgetown University, Washington, DC  
1956: Temple University, Philadelphia, PA  
1955: Seton Hall University, South Orange, NJ  
1954: Brooklyn College, Brooklyn, NY  
1953: N.Y. State College for Teachers, Albany, NY  
1952: Pennsylvania College for Women, Pittsburgh, PA  
1951: Yale University, New Haven, CT  
1950: Bernard College, New York, NY  
1949: Adelphi College, Garden City, NY  
1948: Union College, Schenectady, NY  
1947: Vassar College, Poughkeepsie, NY

# HISTORY OF THE EASTERN SCIENCES CONFERENCE

The first Eastern Colleges Science Conference (ECSC) was organized in 1947 by undergraduate Pauline Newman at Vassar College in Poughkeepsie, New York. The aim then, as now, was to stimulate interest in undergraduate research in the sciences and related fields and to provide a lively forum for the presentation of research papers. Pauline Newman received her bachelor's degree in chemistry and went on to receive a Ph.D. in chemistry from Yale. About 22 schools attended the first conference, and the theme was "Science, Philosophy and Society."

The constitution of the ECSC was ratified on April 24, 1948 at Union College in Schenectady NY, making the conference a self-sustaining body.

In 1972 the Pennsylvania State University was named the repository for all official documents of the ECSC. Professor Stanley Shepherd was named the permanent secretary of ECSC. In 1980 Professor Shepherd stepped down and Professor Gerard O'Leary from Providence College was elected to the post. At the 35th annual conference a steering committee was established to assist in directing the activities of the ECSC.

In 1983 the ECSC was incorporated in Rhode Island and now operates with a Board of Directors, elected from faculty of the participating colleges and universities. In 1986 Professor Gerard O'Leary stepped down, and Professor Edward Gabriel of Lycoming College was elected Chair of ECSC. In 1995 Dr. Gabriel was succeeded by Professor Lance Evans of Manhattan College.

Over the years interest has increased in the conference and over 50 colleges and universities have attended this annual event. Over time the range of subject matter has also expanded and now covers computer science and behavioral and social sciences, as well as the original areas of biology, chemistry, mathematics, physics and engineering.

## ECSC CONFERENCE SITES

2001: Wilkes University, Wilkes-Barre, PA  
2000: Wagner College, Staten Island, NY  
1999: Sacred Heart University, Fairfield, CT  
1998: Niagara University, Niagara, NY  
1997: Central Connecticut State University, New Britain, CT  
1996: Lycoming College, Williamsport, PA  
1995: Ithaca College, Ithaca, NY

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