2004 Abstracts

By Author
By Title

By Author: A B C D E F G H I J K L M N O P Q R S T U V W X Y Z

Switch to Search By Title

A

Maureen Abbott

Kaveh Aghaie

Cara Altimus

Prashant Amin

Nader Amir

Chantelle Anfuso

Tony Anfuso

Ryan K. Armstrong

B

Wendy Ballew

Robert Brady

Mary Elizabeth Brice

Denise Brinson

Josef Broder

C

Melissa Cabinian

Martha Rose Calamaras

Lauren Cantwell

Nicholas Capito

Cameron F. Cavola

Krisda Chaiyachati-1

Krisda Chaiyachati-2

Natasha Chua Tan

Susan Chung

Anthony Cohen

Nathan Copeland

Matthew Crim

D

Shaylee Dave

Jessica Davenport

Daniel del Portal

Dustin Dyer

E

F

John W. Foreman

Chris Freedman

Sarah Fritts

G

Grant Galland

Mark Gonzalez

Elizabeth Goodwin

Patrick Gosnell

Paulette Green

Paulette Green

Cory Gresham

Deepti Gupta

H

Andrea Haltiner

Elizabeth Hebbard

E

F

G

Abstracts

Maureen Abbott
Are Deer Mice the Reservoir of Vesicular Stomatitis Virus?

Despite extensive research efforts to clarify the transmission cycle of vesicular stomatitis virus (VSV), the causative agent of an important arboviral disease of livestock in the western United States, several aspects remain unclear, including the involvement of insects in virus transmission. Experimental infections of natural livestock hosts with the New Jersey serotype (VSV-NJ) have failed to produce sustainable viremia. In studies with deer mice (Peromyscus maniculatus), juvenile deer mice developed viremia following intranasal and intradermal VSV-NJ inoculation. However, it was not determined if the level of viremia was sufficient to infect insects. The objectives of this project are to determine if viremia is present in juvenile deer mice after being fed upon by black flies infected with VSV-NJ, and to determine if black flies can be infected with VSV-NJ by

feeding on viremic deer mice.

Laboratory-reared female black flies (Simulium vittatum) were infected with VSV-NJ by intrathoracic inoculation and allowed to feed on susceptible juvenile deer mice. On post-infection day 3, blood samples were collected from each mouse and tested for presence of VSV-NJ by cell culture inoculation. Additionally, non-infected black flies were fed on mice at the same time period. Viremia had not been detected in any of the mice as of day 6. As of day 7, 4 of 15 mice developed severe posterior paralysis, indicating transmission of VSV-NJ through fly bite. Transmission in the remaining mice will be confirmed by virus isolation from brain samples and serum neutralization assay.

Back to Authors
Back to Titles

Kaveh Aghaie
Zoroastrian Influences on Abrahamic Religions

When people from varying geographic regions interact with one another, certain characteristics cross borders. These characteristics can come in the form of different ideas based on religious beliefs. As these beliefs cross borders, they may be more directly based on cultural characteristics instead of religious principles. One may not realize that a belief that they thought originated with their religion actually originated with another. Within the Abrahamic religions of Judaism, Christianity, and Islam there are specific there are specific religious principles that are viewed to have originated from within, when actually they originated elsewhere. The followers of the Abrahamic religions have come into contact with people from various faiths. Through extensive research I was able to conclude that one of the most influential contacts was with the Zoroastrians of ancient Iran.

The first thing that will be presented is a basic history of the Zoroastrian faith, followed by its influences on the Abrahamic religions. In determining how Zoroastrianism influenced Judaism, Christianity, and Islam I compared the Zoroastrian religious texts with the other religion's texts, drawing specific examples in which Zoroastrian influence is most evident. The sources of my research not only include specific quotes from the Torah, Bible, and Quran, but also from field research in an Atlanta Zoroastrian community, books about ancient Persian history, and travel to Iran.

Back to Authors
Back to Titles

Cara M. Altimus
MODELING AND ANALYSIS OF THE BIOLOGICAL CLOCK IN *NEUROSPORA CRASSA*.
Dr. Jonathan Arnold, Dr. H. Bernt Schuttler Department of Genetics, University of Georgia, Athens, GA 30602

A biological clock is a recurring set of reactions within a system that produces an oscillating pattern. Unlike a traditional “clock,” a biological clock can run continuously so long as all reaction components are present. Reaction rates are the main variants.

Genetic networks are used to understand the relationships between genes, RNA, and proteins. These models show which genes are active, how they become active, what their products do, and their relationships with other genes and their products in the circuit. Then an ensemble of genetic networks for the biological clock was identified, fitting available RNA and protein profiling data. The fitted ensemble was used to identify essential features of the genetic network needed to sustain oscillations. Two features that appear necessary for oscillations are: (1) cooperativity in the action of two clock components, the White Collar (WCC) protein and Frequency (FRQ), and (2) a closed feedback loop in clock components. Along side the ensemble experiments, local stability analysis was done to examine equilibrium properties of the genetic network. Oscillations will only occur if the system does not have a stable fix point. Analytical conditions for instability are derived, permitting

oscillations. In short, the clock needs several interacting proteins, a negative feedback loop, some cooperativity and the absence of a stable fix point to which the system would otherwise equilibrate.

Back to Authors
Back to Titles

Prashant Amin

Identification and partial characterization of insertional mutants in a family of putative glycosyltransferases that may be involved in plant pectin biosynthesis.

Xiaogang Gu and Michael G. Hahn; University of Georgia, Complex Carbohydrate Research Center and Department of Plant Biology.

All plant cells are surrounded by a cell wall that not only provides form and structure to the plant, but is also the interface where plant cells interact with each other. The cell wall is predominantly made up of polysaccharides. Significant advances have been made in our knowledge of the structures of many polysaccharides, but little is known about their function and biosynthesis. We are studying the biosynthesis of pectins, a group of polysaccharides that form one of the macromolecular networks within plant cell walls. We have identified a small gene family thought to encode a group of glycosyltransferases involved in pectin biosynthesis. We are trying to determine the function of the genes in this family by isolating and characterizing plants carrying insertional mutations in these genes. Arabidopsis thaliana seeds with T-DNA inserts within the genes of this glycosyltransferase family were obtained from the Salk Institute. Seeds from the Salk Institute were planted and allowed to grow into mature plants and set seed. Healthy leaves were harvested from individual plants. DNA was extracted from the leaves using rapid DNA extraction techniques. PCR was then used to amplify the part of genes thought to contain the insert. Finally, gel electrophoresis was used to identify the insertional mutants. So far, we have identified Arabidopsis plants that are homozygous for mutations in two of the genes in the gene family. Seed from these plants are being grown to obtain sufficient tissue to analyze their cell walls for compositional changes resulting from the mutations.

Back to Authors
Back to Titles

Chantelle Anfuso and Disha Chhabra

Generating Expressed Sequence Tags from Sorghum bicolor

Dr. Lee H. Pratt and Ms. Shana Seamans

Expressed Sequence Tag (EST) sequencing is a process that allows expressed genes in particular tissues or cell types to be identified through the utilization of complementary DNA (cDNA) libraries. These cDNA libraries are compiled through the reverse transcription of mRNA in an organism's cells. For this project, the organism is Sorghum bicolor, or sorghum, a plant similar to maize. Unlike maize, however, sorghum is capable of withstanding many harsh conditions such as drought, surplus hydration, surplus salinity, and a variety of chemical compositions in its soil. The purpose of this project is to use EST sequencing to identify sorghum's expressed genes. This process begins by inserting cDNA into a plasmid vector of known sequence. The plasmids, all containing different cDNA sequences, are inserted into separate Escherichia coli cells, which are then allowed to multiply. The plasmids were then isolated from the bacterial cells and purified in a three-day process after which each unidentified cDNA sequence was sequenced from both the 3' and 5' ends and analyzed for quality. The sequences will be inserted into a computer database to be compared with other EST data in order to separate highly expressed genes, which are transcribed frequently, from genes that are unique to a particular environmental stress. The discovery of the genes in sorghum used for resistance to environmental stress will contribute not only to the understanding of sorghum's endurance, but will hopefully lead to methods of improving crop plants, which may prove less durable.

Back to Authors
Back to Titles

Tony Anfuso, Matthew Gray
Developing a Fast Plant Expression System to Identify Biosynthetic Genes Involved in Pectin Synthesis
Dr. Maor Bar-Peled

Pectin, the most structurally complex wall polysaccharide, is involved in many plant cellular processes such as cell-cell adhesion, cell-cell recognition, and pathogen recognition. Recent studies provide evidence that pectin may have important health benefits, most notably in the treatment of cancer. In one study, citrus pectin was found to inhibit tumor growth, angiogenesis, and metastasis in mice injected with human breast carcinoma cells. In order to build upon the initial findings, greater understanding of this complicated polysaccharide is essential. While there has been much progress in determining the structure of pectin in recent years, its synthesis remains poorly understood. A crucial step in pectin synthesis is the synthesis of 16 distinct nucleotide-sugars. These activated sugars serve as the immediate substrates for the enzymes that construct pectin. This project's purpose is to design an expression system to identify biosynthetic genes involved in nucleotide-sugar synthesis. Expression of the putative biosynthetic genes in E. coli has been a successful and fast system with previous genes, but has been unsuccessful with the putative UDP-apiose synthase gene as well as other putative genes in past attempts. In this experiment, a stable GST protein was tagged to the protein encoded by the putative UDP-apiose synthase gene, enhancing protein stability and therefore protein expression. Using this GST-fusion method, the alleged UDP-apiose synthase gene is one step closer to being confirmed, making this a promising and fast method for identifying putative genes encoding unstable proteins.

Back to Authors
Back to Titles

K. Ryan Armstrong
Apoptosis of pancreatic exocrine cells in birds infected with Newcastle disease viruses

Newcastle disease virus (NDV) is a highly infectious viral disease of many species of birds, including poultry. In this experiment, two virulent strains of NDV were introduced into chickens, turkeys, and pigeons. The pancreatic tissues were harvested for immunohistochemistry (IHC) for viral nucleoprotein to demonstrate viral distribution, and IHC for active caspase-3 and TUNEL assay to detect apoptosis. The pancreatic lesions of each protocol were then compared, demonstrating the correlation between NDV and apoptotic cells in the pancreas.

Back to Authors
Back to Titles

Robert Brady & Nader Amir
Malleability Of Interpretation Bias In Social Anxiety And General Anxiety
University of Georgia

Individuals with anxiety tend to interpret ambiguous cues as negative (e.g., Amir et al., 1998, Constans, Penn, Ihen & Hope, 1999; Stopa & Clark; 2000). Although one goal of cognitive behavioral therapy is to change the cognitions of individuals with SA and generalized anxiety disorder, it would be more efficient if these biases could be changed experimentally. Recent studies suggest it may be possible to change information processing biases in anxious individuals (e.g., Mathews & Mackintosh, 2000). In the current study, we attempted to change interpretation bias for threat in individuals and examined the effect of these changes on self-report of anxiety. Participants were individuals who reported either high levels of social anxiety or general anxiety. Participants first saw either a positive or a negative prime (e.g., graceful or clumsy) on the computer screen. They then saw an ambiguous sentence (e.g., You dance at the party) and were asked to decide if the word and sentence were related. The computer then provided feedback as to whether their answer was "correct" or "incorrect". Participants were assigned to either a positive training condition or a placebo condition. In the positive training condition, feedback was contingent on their response, (e.g., when the first word was positive, the correct answer was 'yes, they are related.' When the word was negative, the correct answer was 'no, they are not related.').

Therefore, the feedback trained participants to interpret ambiguous information in a positive manner. In the placebo condition, participants received random feedback that was unrelated to their responses. Preliminary results suggest that participants in the positive training condition were faster at deciding an ambiguous sentence had a positive interpretation than were those in the placebo condition. Moreover, they chose more positive interpretations of ambiguous test sentences after positive training than after the placebo. These results suggest that speed and direction of interpretation can be changed using this paradigm. Thus, this training shows promise as an adjunct to traditional cognitive behavioral treatments of anxiety.

Back to Authors
Back to Titles

Mary Elizabeth Brice
Characterization of Microorganisms from Deep Sea Sediment Samples
Mr. Kevin Lee, Mr. Isaac Wagner, Dr. Juergen Wiegel, Department of Microbiology, University of Georgia.

During the Ocean Drilling Cruise (Leg 201) from January, 2002 to March, 2002 in the Eastern Equatorial Pacific Margin samples were obtained to study the presence of anaerobic thermophilic microorganism in various depths of marine deep sea sediments. Four pure cultures were obtained through enrichments performed during the cruise and subsequently purified. Three of the samples came from Leg 201 Site 1227 (Peru Margin) with an ocean floor temperature of 9.0oC (450m below sea level). The other isolate came from Site 1228 (Peru Margin) with an ocean floor temperature of 12.0oC (252m below sea level). All of the isolates came from samples of cores ranging from 1-9m in the upper sediment depth. Preliminary analyses based on 16S rRNA sequence analysis suggest these isolates represent a novel genus in the vicinity of Thermovenabulum or Thermoanaaerobacter. Characterizations includes determination of substrate spectra, NaCl requirement, yeast extract, pH, and temperature profiles of two of the isolates is underway. Preliminary results show an optimal yeast extract concentration of 2% and an optimal pH of 8.0 and 7.0 for the isolate 201-1228P and 201-1227G, respectively. The isolation and characterizations of these novel thermophilic microorganisms gives insight into the distribution of thermophiles in marine sediments as well as the fact that thermophiles can survive for decades at suboptimal temperatures in these sediments.

Back to Authors
Back to Titles

Dennise L. Brinson, Ivomar Oldoni, and Maricarmen Garcia
Examination of peptide specific antibodies for detection of Infectious laryngotracheitis virus (ILTV)

ILTV causes an acute respiratory infection of chickens with moderate mortality, and a decline in egg production. The disease can be easily spread among large poultry production areas if not detected rapidly. Therefore rapid and specific tests for the detection of infected poultry are fundamental to control the disease.

Antibodies against glycoprotein E peptides had been raised in rabbits. We are in the processes to characterize the specificity and reactivity of these antibodies, and their potential use as a tool as a rapid diagnostic test for detection of ILTV infected poultry.

Back to Authors
Back to Titles

Josef Broder
Operational Characteristics of a Mobile Spectral Imaging System
Dr. Chi N. Thai, Biological & Agricultural Engineering Department

Background:

Our research involves the characteristics of vehicle mounted spectral imaging systems for plant health detection.

Proposed Project:
Our method of gathering spatial crop health data involves collecting spectral images via a camera mounted on a tractor to maximize spatial information while minimizing problems of weather and timeliness (as compared to satellite operations). To increase the sampling rate, our camera takes a series of strip-images as they move down a row of crops (push-broom technique). These images must be compiled into a coherent mosaic image with minimal loss in quality and information. The goal of the first phase of the project is to find an optimum strip-image width to minimize final image distortion.

This vehicle-mounted imaging model was simulated in a laboratory setting using a fixed camera mounted above a mobile translation stage. The stage was moved at discrete intervals, and images were taken at each interval to simulate motion. This experiment was performed at various camera angles, as was a second experiment involving rapid image capture as the stage moved continuously below the camera.

Outcome:
The data reflected a linear trend in optimum strip width versus camera velocity, as well as strip width versus viewing angle. These results were consistent with known imaging phenomenon; smaller strip widths minimized distortion and high velocities and oblique camera angles. The linear regressions developed during this experiment could be used in the next phases of the project to predict optimum camera setting for given imaging situations.

Back to Authors
Back to Titles

Melissa Cabinian
Characterization of Cell Lines Derived from Feline Injection-Site Sarcomas
Karen K. Cornell, DVM, Ph.D., Department of Small Animal Medicine and Surgery, College of Veterinary Medicine, University of Georgia

An injection-site sarcoma is a malignant tumor of cats that arises at the location of a previous injection, commonly a vaccination. These occur in approximately 5 of every 10,000 cats vaccinated, are locally aggressive, and spread to other organs in 25% of cats. Complete removal of the tumor is often impossible and cure is rare. We established cell lines derived from 1) a primary injection-site sarcoma, 2) a metastatic lung tumor, and 3) tumors that developed after intact tissue transfer to athymic mice. The growth characteristics and invasive capabilities of the cell lines were determined in vitro in addition to elucidating the in vivo biological behavior of the tumor in athymic mice. Proliferation rates were measured using the CyQuantTM Cell Proliferation Assay yielding population doubling times. Tumor cell invasiveness was assessed using gelatin zymography to evaluate matrix metalloproteinase activity. Tumorigenesis and metastatic potential were studied by injecting tumor cells subcutaneously in athymic mice. Mice were sacrificed and complete necropsy and histopathologic examination performed. Currently, there is no model of this feline cancer. Through the characterization of cell lines derived from injection-site sarcomas, our goal is to develop a rodent model of this tumor in order to study potential genetic markers of prognostic value and possible therapeutic options.

Back to Authors
Back to Titles

Martha Rose Calamaras
Emotion Socialization and Regulation in African American Parent-Child Dyads

This study investigates maternal socialization of children's emotion in a sample of 70 African American parents living in poverty. Of particular interest is the extent to which negative emotional expression (i.e., the expression

of anger, sadness, and fear) is inhibited in the parent-child dyads and what unique environmental factors (e.g., poverty and discrimination) account for making such inhibition functionally adaptive. Parents and their children participated in a video-taped interaction task (Shipman & Zeman, 2002) that was coded for emotion validation/support and invalidation of children's emotion (Schneider & Shipman, 2003). Maternal socialization will be investigated as a function of emotion type and child gender. Further, relationships between parental emotion socialization and children's psychological adjustment (i.e., internalizing, ex! ternalizing difficulties) will be examined. Findings will be discussed with regard to how maternal socialization strategies may facilitate adaptation within their family and neighborhood context.

Back to Authors
Back to Titles

Lauren Cantwell
Cloning Genes from the *T. cruzi* Genome and Observing Infectivity of Wild Type *T. cruzi* Compared to the Cloned Gene Products

Trypanosoma cruzi, a protozoan parasite, causes Chagas disease, a potentially fatal disease involving heart and gut tissue in humans. T. cruzi expresses cysteine proteases (cp), enzymes that aid in invasion of mammalian cells and replication of the parasite within cells. The important role of cp in parasite survival in mammals suggests that these proteins may be good vaccine candidates. The cp are encoded by an estimated 131 genes in T. cruzi. To investigate if the cp could be an effective vaccine, we will inject mice with different sets of cp genes and assess the ability of the cp genes to protect against lethal challenge with T. cruzi. The first step toward generating cp vaccines was to design primer combinations to amplify the various cp gene variants. Using these primers we then used polymerase chain reactions to amplify the target sequences from T. cruzi DNA. Adaptamer reactions were then performed to attach sequences needed for cloning into Gateway (invitrogen) adapted vectors. Currently, two cp clones are ready to be shuttled into a vaccination plasmid, 2 cp clones are ready to undergo transformation in an E. coli medium, and 11 cp clones are undergoing the adaptamer reaction. Once all clone products are obtained, these will be shuttled into a vaccination plasmid and injected into mice as DNA vaccines. The ability of different cp clones to protect the mice against lethal infection with T. cruzi will then be assessed.

Back to Authors
Back to Titles

Nicholas Capito
Cytoxic Effects of A?42, RAGE, and A?42 & RAGE Complex of PC12 Cells and the Formation of of Senile Plaques in the Brains of Alzheimer's Patients

Alzheimer’s disease (AD) is a neurodegenerative dementing disorder affecting half of our elderly population of ages 85 and above. Senile plaques (SPs) composed of a 42 amino acid beta amyloid (A???peptide fragment have been recognized as the hall mark of AD-patahogenesis; though the contributory factors for SPs are not known yet. Autoimmunity seems to play a promient role in disease progression. We hypothesize that age is one of the crucial factors in AD initiation and an important aging process to form advanced glycation end products (AGEs) and their receptors (RAGEs) to complex with A?42 might play a major role in AD. To test our hypothesis, we conducted in-vitro and in-vivo experiments. Differentiated PC12 cells treated with 10-100?M concentrations of in-vitro incubated A?42??RAGE, and A?-RAGE complex showed that the A?42?RAGE complex produced a much greater cytotoxic affect on PC-12 cells compared to cells incubated with either RAGE or A???? alone. In another series of experiments, plasma and autopsy brain tissue extracts derived from individuals with AD and normal elderly control individuals revealed a 2-3 fold increase in RAGE and A?42 IgG levels in the AD samples relative to the control samples. These samples also exhibited a near 1:1 ratio between RAGE and A?42 IgG levels indicating that the auto-antibodies were binding to the same protein or protein complex. These experimental results suggests that RAGE and A?42 complex in vivo, and that the complex is a highly potent immunogen capable of provoking auto-immune and cytotoxic responses in both the

peripheral blood and within the brain.

Back to Authors
Back to Titles

Cameron F. Cavola
The Identification of *Trypanosoma cruzi* Surface Proteins Using Bioanalytical Mass Spectrometry

The protozoan *Trypanosoma cruzi* is the causative agent of Chagas disease, a major ailment of millions of people in the rural areas of South America. Humans represent an intermediate host for this parasite while the reduviid bug, *Triatoma infestans*, is the definitive host. The life cycle of this organism cycles between these two hosts and involves four life stages: metacyclic trypomastigotes, epimastigotes, amastigotes, and trypomastigotes. The surface proteins expressed during these life stages represent the majority of what is displayed to the immune system, and thus are critical to the subsequent immune evasion. This surface includes transmembrane and glycophosphatidylinositol (GPI) anchored proteins with functions ranging from invasion to control of morphological transitions. In our study we attempted to isolate the membrane and strip the glycosylation from mucins using a process known as ß-elimination. Following purification and digestion, we sequenced the resulting peptides using tandem mass spectrometry and identified them by searching the spectra against the newly annotated *Trypanosoma cruzi* genome. The identification of these surface proteins and further investigation into their role during infection may lead to their future use as vaccine targets.

Back to Authors
Back to Titles

Krisda Chaiyachati
Uncovering the structural function of an additional amino acid sequence in the long form of augmenter of liver regeneration (ALR) through biochemical and structural comparisons of long and short ALR

Though much data has contributed towards understanding the role of augmenter of liver regeneration (ALR) in regeneration, little is known about the biochemical and functional properties of the protein. A sulfhydryl oxidase hepatotrophic factor originally identified through bioassays of regenerating rat and canine livers following partial hepatectomy, ALRp is a cone-shaped helical bundle containing a bound FAD molecule at the mouth of its cone. The presence of FAD is of particular interest for two reasons. One, the high stability of FAD in the absence of an identifiable dinucleotide binding motif suggests a unique FAD binding motif. Secondly, ALR is the first FAD containing growth factor ever identified, implying the possibility that ALR is a redox-sensitive cellular regulator. This study uncovers the role ALR's structure plays in FAD reduction by focusing on two forms of ALR: a long and a short form, Caenorhabditis elegans ALR and rat ALR, respectively. C. elegans ALR contains an additional disulfide bridge (C9-C13) in a 35 aa sequence preceding the N-terminal of the 125 aa sequence characteristic of rALR. It is believed that these additional cysteines in C. elegans may play a role in the stability of FAD. Therefore, recombinant forms of short C. elegans ALRp without the additional 35 aa sequence as well as a long rALRp containing the 35 aa's were synthesized and compared to their respective counterparts through examination of crystal structures and reduction kinetics in the presence of dithiothreitol (DTT). Conclusions are made about the function of the additional amino acid sequence.

Back to Authors
Back to Titles

Krisda Chaiyachati, Edmund Morrell, and Sachin Varghese
The PATRIOT Act: Amending the Foreign Intelligence Surveillance Act and Diminishing Civil Liberties
Dr. Loch Johnson, Department of Political Science, University of Georgia

Under the guise of national security and September 11th, the PATRIOT Act repeats a pattern in which the U.S. government has relaxed the protection of civil liberties and fundamental rights. A history of Executive Branch

agencies neglecting fundamental rights led to the Foreign Intelligence Surveillance Act (FISA) and the Church Committee. Reforms, recommended by the Church committee and implemented through FISA were put in place to protect the American people from an overzealous government or intelligence agency blinded by its pursuit of national security. The PATRIOT Act's amendments weaken the protection of civil liberties and effective accountability. The Act expands governmental powers and removes many of the existent safeguards, leaving Americans open to an empowered executive branch unrestrained by effective oversight. Since its inception, actions taken under the provisions of the PATRIOT Act have been shrouded in secrecy, even from Congressional oversight committees. In order to prevent violations mirroring those prior to FISA and the Church Committee, reforms must be made to the Act. What is needed is more consensus, more intense oversight which does not only include a reactive judiciary but also a constructive, proactive Congress, and more candidness about what freedoms are being sacrificed in order to protect the United States from terror. Only after a nation weighs the costs of a domestic war on terror can it strike the proper balance between freedom and safety.

Back to Authors
Back to Titles

Natasha Chua Tan, CURO Apprentice
Wealth Creation in America
Dr. Charles Hofer, Department of Strategy & Entrepreneurship, Terry College of Business, University of Georgia

How do most Americans generate personal wealth? Fred J. Young, former Vice President of the Harris Trust & Savings Bank of Chicago, analyzed, over a 40 year period, the sources of wealth of Harris clients who provided the bank with over $1 million in capital for investment. His study concluded that the two most prevalent ways of accumulating wealth were through starting and selling a business and real estate investments. In this research, we apply Young's research principles to a new business climate. Data will be collected from local trust departments in the Athens-Atlanta area through interviews and questionnaires. The information gathered will describe the basic strategies used by Americans today to accumulate/earn significant wealth. We will also review Young's How to Get Rich and Stay Rich and perform a comparative analysis of our data versus his observations. With these results, we will be able to determine what factors drive the greatest creation of wealth in America, and explain the role of entrepreneurship and small business creation in the modern economy.

Back to Authors
Back to Titles

Susan Chung
Variability in the OGLE Sky Survey
Dr. Scott Shaw

Eclipsing binary systems in which both stars are cool M stars are exceedingly rare. Fewer than ten are currently known. Searching large sky surveys, such as OGLE II, holds the promise of doubling or tripling the number of known M-type eclipsing binaries stars. Multiple computer programs run on data sets taken by the OGLE Sky Survey group has carefully selected variable stars out of forty nine fields of the Galactic Bulge. Each field contains about 2000 to 8000 variable stars. Currently, computer programs have not been able to classify all the various types of variable stars nor have the programs been able to identify which stars are M-type eclipsing binaries. Using Excel's spreadsheet, AVE's light curve graphing and phasing program, and standards set in rejecting period aliases, we are now closer to our goal of automatic selection through the use of computers.

Back to Authors
Back to Titles

Anthony Cohen

Effects of nutrients on leaf decay and detritivores in a headwater stream.
Wyatt Cross, Jennifer Greenwood, Roger Hilton, Dr. Amy Rosemond, Institute of Ecology, University of Georgia

Nutrient enrichment of stream ecosystems is a widespread problem caused by non-point source pollution. Excess nutrients profoundly affect aquatic ecosystems and are an important cause of declining water quality world-wide. The effects of nutrient enrichment are known for primary producer based systems, but are less well-known for detritus-based systems. To test the effects of nutrients in a detritus-based system, UGA researchers have continuously added nitrogen and phosphorus to a headwater stream at the Coweeta Hydrology laboratory in North Carolina and compared effects to a reference stream. This study examines effects of the continuation of that enrichment from year 2 to year 3. Decay rates of leaves were measured as an indication of effects of nutrients on invertebrate and microbial processing of organic matter, which is an important ecosystem process. The decay rate and invertebrate biomass and composition will be determined from litter bags that were placed in the enriched stream and reference stream and compared to values determined from previous years of enrichment. The leaf packs were assembled using rhododendron leaves from the fall. The packs were collected at 14, 30, 55, 70, and 118 days. Invertebrates will be sorted from leaves, preserved in formalin and keyed to species. Invertebrate biomass will be determined from measuring individuals to the nearest 0.5 mm and using length-weight regressions. These data will add to our understanding of nutrient effects in detritus-based aquatic ecosystems and help to predict the effects of enrichment on higher trophic levels in detritus-based food webs.

Back to Authors
Back to Titles

Nathan Copeland
***Mycobacterium marinum* Promoter Library**

Mycobacterium tuberculosis is responsible for the deaths of three million people annually, and it has been estimated that possibly 1/3 of the world's population is infected. In addition, *M. tuberculosis* is the second leading killer of those afflicted by AIDS. For these reasons, the study of*M. tuberculosis* is of vital importance. However, due to the technical difficulties associated with research on this pathogen, a surrogate organism, the marine relative, *M. marinum*, has emerged as a popular alternative. *M. marinum* is a close genetic relative of *M. tuberculosis*, possesses a faster growth rate, does not cause serious human infections, and is more susceptible to genetic manipulation. Similarities in the initial host-pathogen interactions between *M. marinum* and *M. tuberculosis* have been observed suggesting that these bacteria may possess common virulence mechanisms. In this study, we will identify *M. marinum* virulence genes using promoter trap technology. An *M. marinum* promoter library possessing a green fluorescent protein reporter has been created. Once these constructs are transformed into *M. marinum*, fish macrophages will be infected, and the clones of interest that fluoresce green will be isolated. The promoter sequences will be identified, and the *M. tuberculosis* homologues of these genes will be studied.

Back to Authors
Back to Titles

Matthew Crim
Functional Analysis of CD8+ T cell Epitopes in Experimental Trypanosoma cruzi Infection Using ELISPOT and In Vivo Cytotoxicity Assays

Trypanosoma cruzi is the etiologic agent of Chagas disease, a condition affecting sixteen to eighteen million people and causing fifty thousand deaths each year in Central and South America. A murine model mimics human infection as parasite persistence in muscle tissue is common in both mice and humans. Studies in gene-knockout mice have demonstrated the importance of CD8+ T lymphocytes in the concerted immune response to combat infection. However, little is known about the antigen specificity of the CD8+ T cells activated by this infection. The first identified epitope of the CD8+ T cell response to T. cruzi was peptide 77.2 (VDYNFTIV), a

member of the transialidase gene family consisting of over 600 genes. A BLAST search of the transialidase gene family in the TIGR database revealed over 400 peptides with homology to peptide 77.2. The ability of these peptides to stimulate a CD8+ T cell response was examined utilizing an in vivo cytotoxic T lymphocyte assay and an ELISPOT assay of cytokine production. Four peptides were identified that elicited both specific cytolytic activity and interferon gamma production by CD8+ T cells. Peptides were also identified that induced interferon gamma production without corresponding cytotoxicity. Current work is focusing on the question of whether the homologues of the peptide 77.2 epitope can antagonize the response to each other through altered peptide ligand effects. We are examining the hypothesis that peptides derived from transialidase gene family members that do not fully activate the CD8+ T cells are involved in parasite evasion of the host immune response.

Back to Authors
Back to Titles

Shaylee Dave
Estrogen Signaling in Coronary Artery Smooth Muscle
Dr. Richard E. White, Ph.D., Pharmacology, Medical College of Georgia, Augusta GA 30912

Estrogen has been known to be beneficial in reducing cardiovascular dysfunction by acting as a vasodilator. Recent studies have suggested that restoration of estrogen through hormone replacement therapy actually hinders the prevention of cardiovascular dysfunction. The purpose of this study has been to explore the possible dual role of estrogen. Through pharmacological techniques such as patch-clamp and tension studies; and biochemical techniques such as immunoblotting we have been able to study whether estrogen stimulates the generation of nitric oxide (NO), a vasodilator or superoxide (O2-), a vasoconstrictor. Single cell-attached patch clamp studies showed that estrogen opens the large conductance voltage-and-calcium dependent potassium channels (BKCa) in porcine coronary artery smooth muscle cells. Fluorescent studies showed that estrogen stimulated the generation of NO through NOS. The present study suggests estrogen stimulates neuronal nitric oxide synthase (nNOS), in particular, to generate NO. Immunoblotts of denuded coronary arteries showed a greater expression of nNOS in comparison to the other two isoforms. Patch-clamp studies showed that inhibition of the ability of nNOS to produce NO by using N?-propyl-L-arginine (L-NPA), blocked the ability of estrogen to stimulate the opening of BKCa channels. Tension studies showed that when the ability of NOS to produce NO was inhibited, estrogen, caused a contraction

Back to Authors
Back to Titles

Jessica Davenport
Environmental regulation of extracellular protein synthesis in *Staphylococcus aureus*.

A number of previous studies have shown that variation of environmental conditions can greatly affect the growth and behavior of the major human pathogen *Staphylococcus aureus*. In this study we have characterized the specific effect of alterations in environmental conditions on the production of two major virulence determinants implicated in the pathogenesis of *S. aureus*, aureolysin (*aur*, a zinc-dependant metalloprotease) and the V8 serine protease (*ssp*). Introduction of 1M NaCl into growth media of S. aureus results in a complete lack of transcription proceeding from both the *aur* and *ssp* operons in all strains studied with the exception of the protease hyper accumulating strain PC1839. Indeed even in PC1839 an approximately 5-fold reduction in transcription was observed for both of these loci in the presence of NaCl. Not only did 1M NaCl abolish production of these protease but more profoundly the secretion of all other major extracellular proteins was almost entirely absent. Growth of studies of *S. aureus* at both 25C and 30C also revealed a similar decrease in protease synthesis, without significant variations in final growth yields. Interestingly these conditions did not produce the total lack of extracellular virulence determinants observed in the presence of supplemental NaCl, indicating an alternative mechanism of transcriptional repression. This information has important implications in the ongoing study of the mechanism by which this organism can exist both as a harmless commensal and a potential fatal infective pathogen, and how it alternates between these states.

Back to Authors
Back to Titles

Daniel del Portal
Actin Rearrangement and Hirano Body Formation as Modulators of Apoptosis
Marcus Fechheimer and Ruth Furukawa

Hirano bodies, paracrystalline cytoplasmic inclusions enriched for the cytoskeletal protein actin, have been noted in post mortem analysis of neuronal tissue in patients suffering from a wide variety of neuropathological conditions, including Alzheimer's disease, Parkinson's disease, and amyotrophic lateral sclerosis. The basic physiological role that Hirano bodies play in cells is unknown. Formation of model Hirano bodies can be induced in a variety of cell types by introduction and expression of mutated forms of the *Dictyostelium* 34 kDa actin-bundling protein. Evidence indicates that mouse fibroblast L cells stably expressing a truncated C-terminal fragment (CT, amino acids 124-295) of this protein are less susceptible than wild type cells to programmed cell death (apoptosis) induced by oxidative stress. My research has focused on further exploring the possible relationship between Hirano bodies and apoptosis. Fibroblasts stably expressing the CT protein and exposed to the DNA-damaging drug etoposide, an inducer of p53-dependent apoptosis, were not significantly more viable than wild type cells. Thus, Hirano bodies do not protect cells from apoptosis mediated by the tumor suppressor protein p53. By contrast, in transfected human cervical cancer HeLa cells, the CT protein itself seems to act as an apoptotic trigger. I have experimentally determined by treatment with pharmacological and genetic p53 inhibitors that CT-induced apoptosis in HeLa cells is p53-independent. Thus, the presence of Hirano bodies can modulate apoptosis in a positive or negative way, depending on the cellular context. In all cases studied, the effects of Hirano bodies on apoptosis do not appear to involve p53. These studies of the relationship between model Hirano bodies and apoptosis may contribute to our understanding of the role these inclusions play in disease processes.

Back to Authors
Back to Titles

Dustin Dyer
Energy Dissipation in Nanomechanical Resonators
Dr. Guigen Zhang, Department of Agricultural and Biological Engineering, The University of Georgia
Dr. Michael Geller, Department of Physics and Astronomy, The University of Georgia

Nanomechanical resonators are miniscule pieces of solid that are now being recognized as contenders to replace bulk quartz crystals and surface-acoustic wave resonators to provide more accurate timing in precision measurement equipment. A good resonator exhibits an extremely long resonating lifetime when compared to its period of oscillation, or a high quality factor (Q factor). At present, the combination of mechanical devices and modern electronics has been very successful, but their speeds of operation are much too slow to compete with the speed of today's technology. Small nano-sized materials would make much higher operating frequencies possible; yet, Q factor has been shown to decrease with the decreasing sizes of these materials. Mechanical radiation of energy by the resonating structure into its support and the non-linearity between the different sized resonators are two possible causes for this extra energy loss. There have been studies evaluating the radiation of energy; however, there have not been many studies assessing the non-linearity issue. We have performed non-linear analyses using finite element analysis (FEA) to investigate both possibilities. For this investigation, we developed two dimensional models consisting of cantilever beams with small visco-elastic sections at the fixed ends. Our results using inch sized models suggest that the energy loss through the supports may play a larger role than non-linearity. We are working to overcome hardware difficulties found while creating smaller models to further study these issues at the micro and nano sizes.

Back to Authors
Back to Titles

John W. Foreman
New Shapes in Knot Theory: nth Hulls of Knotted Curves

Recruiting posters and advertisements for graduate math programs, mathematics conferences, and think tanks try to capture the viewer's eye, using beautiful shapes discovered in new research to arouse curiosity. Certainly this is a more effective means catching attention than a drab photograph of numbers and symbols on a chalkboard. A substantial number of these shapes have come from knot theory: a branch of mathematics that has proved valuable both for its applications in genetics, physics, and coding and for the remarkable images that come from its objects of study. One new source of beautiful shapes comes from the nth hulls of knotted curves, which only recently have been modeled on the computer.

The convex hull of a knot is the set of points such that any plane that intersects the set must cut the knot twice. Similarly, the nth hull of a knot is the set of points through which every plane cuts the knot 2n times. The author with the help of advisor Dr. Jason Cantarella has developed a computer program, TwoHull, which given a knot is capable of modeling any associated nth hull. Essentially, TwoHull "carves" the nth hull by cutting along a subset of the planes mentioned above. The 3-dimensional forms produced by TwoHull beautifully represent intriguing properties of ordinary knots and are valuable both aesthetically and mathematically. A short film will be shown of nth hulls as they are carved and rotated.

Back to Authors
Back to Titles

Chris Freedman
Modeling Contributing Factors of Alzheimer's Disease: Expression Studies of Yeast Ste23p

STE23 is a gene of *Saccharomyces cerevisiae* (yeast) that encodes the STE23p protease. Proteases are proteins that cleave other proteins at specific sites. In the case of *S. cerevisiae* , Ste23p is known to be one of two proteases involved in the cleavage of a precursor to the pheromone " **a** -factor," which is a key signaling molecule in the process of yeast mating. Currently, there are no significant publications about Ste23p despite its extensive similarity to human Insulin Degrading Enzyme (IDE), a protease involved with the prevention of Alzheimer's disease. Our lab has found that epitope tagging Ste23p does not affect its function, and this finding has allowed further cellular and biochemical experimentation of this enzyme. In particular, we have found that *STE23* is expressed in all yeast cell types unlike Ax11p (a closely related enzyme). Ste23p is also over-produced compared to Ax11p. Finally, we have found that the presence of a gene named *YDJ1* is needed for optimal expression of Ste23p. We will discuss these findings in more detail and present new data for using yeast as an expression system for IDE. We expect that our finding on STE23 will lead to new insight concerning the life of *S. cerevisiae* and also provide a simple model for understanding more about human IDE.

Back to Authors
Back to Titles

Sarah Fritts
An inventory and assessment of medicinal plants and animals used by traditional healers in Limpopo Province, South Africa
John P. Carroll, Warnell School of Forest Resources, University of Georgia, Athens, GA

Traditional healers play a role in an estimated 80% of the South African population. Harvesting plants to meet this urban demand has become environmentally destructive in some areas. Considerable strain is also placed on several animal species used in traditional healing, many of which are already protected. The origin and accessibility of these natural resources are unknown; therefore, the impacts on the environment have not yet been determined. This study identifies plant and animal species used by a traditional healer in the Limpopo Province, South Africa. Verbal data was collected from the chief traditional healer with the help of a Tsonga

translator. Additional information on species identification, harvest site, cost, parts of species used, ease of getting, and medicinal usage of the species were summarized. Each species' statuses according to The World Conservation Union (IUCN) Red Data List of Threatened Species and the Convention on International Trade in Endangered Species (CITES) appendices were obtained. We identified 69 species, 34 animals and 35 plants. These animals were harvested from Mozambique, 35%, Zimbabwe, 21%, and locally around the village, 21%. At least 35% of the animals are protected under CITES, either under Appendix I, 12%, Appendix II, 15%, or Appendix III, 9%. One animal species is also considered endangered and 3 vulnerable in the Red Data List. We assessed habitat preference of each species and found most animals, 75%, to be savanna/grassland species. Most plants, 86%, were harvested locally around the village. Our data suggests the presence of a large network in trade of animal and plant parts, which includes international boundary issues.

Back to Authors
Back to Titles

Grant Galland and Allison Vogt
The Effects of Benthic Particle Size on Relative Abundances of Stream Fishes
Dr. Gene Helfman, Institute of Ecology, University of Georgia

I investigated possible correlations between benthic particle size and fish assemblages. Particle size is ultimately affected by land use practices, where more land disturbance (=less forest cover) often leads to a smaller average particle size. Widely dispersed, generalist fish species were designated "cosmopolitan," whereas those species restricted to more undisturbed, highland habitats were designated "endemic." Fish were collected in streams in the Little Tennessee River drainage and relative abundances of these two groups were determined. Mean benthic particle size was measured at several points in each reach. Streams with higher average particle sizes had apparently higher endemic to cosmopolitan ratios, but the relationship was relatively weak, indicating that other factors must be involved.

Back to Authors
Back to Titles

Mark Gonzalez and Vanicia Miller
Identifying Expressed Sequence Tags involved in wound response from Sorghum bicolor.
Dr. Lee Pratt and Ms. Shana Seamans

An Expressed Sequence Tag (EST) project utilizes complementary DNA (cDNA) reverse transcribed from mRNA to identify genes expressed in tissues, cell types, or a whole organism under a desired environmental condition. *Sorghum bicolor* is a plant similar to maize that can withstand harsh environmental conditions such as drought and excess salinity (National Grain Sorghum Producers: http://www.sorghumgrowers.com). The purpose of our project is to generate and analyze ESTs from sorghum seedlings that were wounded by crushing one-half of their second leaf and seedlings that were grown on methyl jasmonate media. Methyl jasmonate induces a stress response similar to wounding (Hudgins *et al*., 2004). After reverse transcribing the mRNAs into cDNAs, the cDNAs were inserted into plasmids, which were transformed into *Escherichia coli* bacterial cells. The *E. coli* cells were amplified and the cDNA-containing plasmids were purified. The ends of the cDNAs were sequenced to generate the ESTs. To date, 3702 cDNA-containing plasmids have been isolated, the ends of which are currently being sequenced to produce 7404 ESTs. These sequences are being analyzed for quality and contamination The "good" sequences will be grouped into contigs to eliminate the redundancy observed for highly expressed genes, which are transcribed more frequently than others are and thus likely to be sequenced more often. The numbers of sequences present in each contig will also reveal the relative level of expression of each gene expressed during wounding response. The contig sequences will be compared to a database of known protein sequences via BLAST (Altschul *et al.*, 1990) to identify novel genes and those genes most actively transcribed following wounding.

Back to Authors

Back to Titles

Gehres Paschal
12th Century Medical Treatments Described in Hildegard's Cause et Cure and the Success of 21st Century Pharmaceutical and Medical Research
Dr. Katharina Wilson

Hildegard of Bingen was a twelfth-century nun, writer, theologian, natural philosopher, medical practitioner, political activist and playwright among other tittles. She is also the presumed author of the original medical text Liber simplicis medicinae, more commonly known as Physica, originally presented in a set of five manuscripts. One of the documents, Cause et cure (Causes and Cures) contains twelfth century medical principles and has been preserved in a thirteenth century manuscript. The concepts discussed in Cause et Cure incorporate the Empedoclectic doctrine: four distinct elements- fire, air, water, and earth-which are essential to all life. These four basic elements are also an integral part of the ideas illustrated in the Corpus Hippocraticum, one of the most well-known medical documents of Antiquity. Each of the Empedoclectic factors corresponds to the four fundamental bodily fluids: yellow bile, blood, phlegm, and black bile. In Cause et Cure, Hildegard describes a healthy person as having a balance of these four bodily fluids; therefore, a diseased person would have an imbalance of any of the four bodily substances also known as "humors." In Cause et Cure, Hildegard prescribes treatments that essentially readjust the imbalance of the humors via diet, medication, lifestyle, as well as the elimination of waste matter via sweating, sneezing, crying, vomiting and bloodletting. Many of Hildegard's proposed medical treatments stem from the Hippocratic tenet "cure opposites with opposites." Hildegard also prescribes many natural remedies such as the use of bear fat and wheat for treating hair loss, as well as a sage and vinegar concoction that is used to treat migraine headaches. Between 1983 and 1994, over forty percent of the drugs approved by the FDA were derived from natural compounds. Furthermore, natural compounds often provide a lead to the development of new synthetic drugs. In intend to deconstruct particular natural remedies described in Cause et Cure, and through contemporary scientific analysis, reveal any similarities in the chemical basis of various medications used today. I would also like to examine the possibility of additional research surrounding the natural remedies described in Hildegard's Cause et Cure in the context of future drug discovery.

Back to Authors
Back to Titles

Elizabeth Goodwin
Chronic Illness and the Benefits of Therapeutic Summer Camp
Mentor: Dr. Ronald Blount

Children with chronic medical conditions are often subjected to greater stressors and less socialization and independence than are healthy children. The main concentration of my research has been a therapeutic summer camp for children with cardiac disorders. Attending this camp provides these children with an opportunity to be in the presence of other children with similar cardiac conditions, fostering a sense of likeness and support as they participate in the camp activities, which often reach far beyond the scope of the activities they are able to engage in elsewhere. Parents are given a respite during which time they are not primarily responsible for providing their child's care. The study's purpose is to evaluate the effects of the summer camp on these children and their overall functioning. Measures have been gathered at three stages: pre-camp, at-camp, and post-camp. Both the children and parents fill out measures, allowing the collection of data on aspects such as prior camp experience, maternal separation anxiety, camp expectations, and psychosocial functioning. The data that has been gathered from this study provides insight into the psychology of pediatric chronic illness and will allow for improvement in approaches used to treat these children beyond their illnesses. We hope to continue gaining insight into the effects that cardiac disorders have on children's lives and to evaluate whether therapeutic summer camp can provide a normalizing experience for children whose lives are often far from "normal."

Back to Authors

Back to Titles

Patrick Gosnell
The Beautiful and the Absurd
(Under the direction of Prof. Ben Reynolds)

Beauty is all around us. At least, that is the goal of every advertising agency and marketing executive in America. Every day we are bombarded with a multitude of images, all of which are designed to "educate" the public as to what Beauty truly is. However, most of us know the bitter truth: the marketed glamour image is simply a perversion of reality. Attempting to achieve this image is hopeless at worst, absurd at best.

My photographs turn the tables on the glitz and glamour of the fashion world by showing that there is nothing very pretty about it at all. Many aspects of this industry can be considered slightly insane – from the painful contortions the models must perform, to the outrageous clothing that nobody actually wears in real life. I create images that subvert that which is beautiful by adding elements such as gore, excess, and the bizarre. My goal in highlighting the "dark side of beauty" is for the public to lighten up and to take themselves, and how they are expected to look, a little less seriously.

Back to Authors
Back to Titles

Paulette A. Green
Conspecific Sperm Precedence and Speciation in *Drosophila pseudoobscura*

In nature many species coexist sympatrically without interbreeding which is prevented by strong reproductive isolating mechanisms, i.e., pre-mating isolation and post-mating isolation (Dobzhansky,1951). We have studied possible reproductive isolating mechanisms utilizing 1) two races of *D. pseudoobscura*, Mainbody (M) and Bogota (B), that are in the process of diverging and 2) two sibling species, *Drosophila pseudoobscura* (O) and *D. persimilis* (S), that diverged 500,000 years ago. We compared the amount of sperm transferred and the number of progeny after mating females with conspecifics and heterospecifics. There was a significant difference in sperm transfer between conspecific matings and heterospecific matings: Bogota female accepted more sperm when mating with Bogota male than when mating with Mainbody male (P=0.0477). The same trend, though statistically insignificant, was observed for Mainbody female (P=0.1435). Tests between *D. pseudoobscura* and *D. persimilis* are still ongoing. When females subsequently mated with conspecific and heterospecific males or vice versa, the conspecific matings produced more progeny than heterospecific matings regardless of order of mating, except for Bogota females (P=0.0145 for M?M?B?; P<0.001 for M♀B♂M♂; P=0.0077 for O♀O♂S♂; P<0.0001 for O♀S♂O♂; P=0.0002 for S♀S♂O♂; P=0.3832 for S♀O♂S♂). In the B♀B♂M♂ the second, heterospecific, male (M) produced more progeny (P=0.0137), and in the B♀M♂B♂ cross there was no difference in the number of progeny by the subsequent matings (P=0.9137). These results suggest a possible role of cytoplasmic incompatibility in hybrids and genes that cause the hybrid inviability we observed in this project.

Back to Authors
Back to Titles

Paulette A. Green
The effect of behavioral interactions between sexes on mate preference in *Drosophila pseudoobscura*

Natural selection is expected to adjust behavior to increase fitness. We tested this hypothesis with *Drosophila pseudoobscura* while observing the relationships between mate preference and fitness. Mate preference was determined in small arenas where a single fly was allowed to choose between two flies of the opposite sex eliminating all possibilities for male-male competition, female-female competition and male coercion or

manipulation of females. Matings were arranged with preferred (P) and non-preferred (NP) partners. Our early studies (Anderson *et al.* , in press) have demonstrated that fecundity was higher in NP matings but not statistically significantly different from in P matings. However, offspring viability was significantly higher in P matings. Subsequently, we measured fitness of males while counting number of sperm delivered to females during copulation. In both male and female choice situations, NP matings delivered significantly more sperm to females than P matings. These results suggest that 1) freely expressed mate preference affects the fitness of offspring; and 2) the increase in fecundity and sperm observed in NP matings may be compensatory behavior for a low viability of offspring from these matings. In attempts to investigate associations between mate preference and mate choice, flies collected from the mate preference tests were observed in mating chambers while measuring courtship and mating behavior. When ecological interaction among individuals was reinstated in the mating chambers, there were no significant differences in number of matings with P and NP partners that we observed in mate preference tests. Males did not discriminate between P and NP females but they significantly more mated with first encountered-females (? 2 = 5.12, p <0.05). However, females did not show significance in matings (? 2 = 3.10, ns) between first courting males and second males. Under ecological and social constraints, we did not find significant differences in copulation latency and duration as well as in number of sperm delivered to P and NP partners. These results support our early observation that individual males and females facultatively vary behavior.

Back to Authors
Back to Titles

Gresham, Cory and Sanchez, Susan
Rodent Vectors in the Transmission of Multi-drug Resistant Pathogens in a Small Animal Teaching Hospital
Athens Diagnostic Laboratory, College of Veterinary Medicine Athens , GA

Previous research has shown the presence and spread of nosocomial *Escherichia coli* and *Enterococcus* strains resistant to several antibiotics in the University of Georgia Small Animal Teaching Hospital . The past work focused on isolates from the environment as well as from animal wounds. Soon after drug-resistant characterizations of these isolates were completed, rodent nests were discovered under rehabilitation cages in the surgery ward. Common house mice (*Mus musculus*) feces contain large numbers of enteric bacteria. This research investigates the possibility that these mice act as a reservoir of previously described isolates. E *scherichia. coli* and *Enterococcus* sp. were cultured on selective media from feces, bedding material, and desiccated rodent bodies found in the nests. At least two strains of *E. coli* resistant to Ceftiofur, Chloramphenicol, Enroflaxin, Ampicillin, and Tetracycline were detected. These two strains were identical by ERIC PCR to strains detected by the past work. *Enterococcus* strains resistant to Gentamycin, Ceftiofur and Ampicillin were also cultured. Total nucleic acid was extracted from strains of both species. A resistant *E. coli* culture was positive for class 1 integrase gene and a florfenicol resistance gene, *flo,* by PCR. Total nucleic acid extracted from fecal pellets were tested by PCR for the presence of *Salmonella* sp., *Campylobacter* sp. and *Leptospira* sp. The implication that rodents may be a vector in spreading, and a reservoir for multi-drug resistant bacteria validates rodent control as a method to help prevent nosocomial infections in the hospital setting.

Back to Authors
Back to Titles

Deepti Gupta
HOW HAS HIV/AIDS IMPACTED THE SUPPLY AND DEMAND OF EDUCATION IN KENYA?

Case Study: Rift Valley Province

Within one decade AIDS/HIV prevalence in Kenya tripled from 4.8% in 1989 to 13.5% in 1999. During this period another alarming trend occurred, the enrollment rate of primary school students began a steep decline. Sparked by a UNAIDS ambassador's comment that related the hazardous effects of HIV/AIDS on education, I wanted to discover if there was a relationship between the rising infection rate and the reversal of education trends in Kenya. I use both primary and secondary data to determine what impact HIV/AIDS has had on the supply and demand of education in Kenya. Within the secondary data, I examine the role of school fees, the perceived benefits of education, the orphan crisis, family income, HIV status of education professionals, and emotional stress. By using regression analysis on primary data collected in May-June 2003 from three primary schools in Rift Valley Province in Kenya, I can present case studies that highlight certain aspects of the complicated relationship. In particular, I consider the function of ethnicity, gender, number of siblings, type of school, and method of HIV/AIDS-education on the students' knowledge and perception of the virus and its spread. The rate at which young people are infected with HIV/AIDS has soared, a 300% increase in the past ten years. Meanwhile, enrollment and teacher participation rates have steadily fallen from 92% to 86%. These numbers are more than likely uner-reported. The paper concludes by identifying the most effective policy changes that are working to alter these disturbing trends.

Back to Authors
Back to Titles

Andrea Haltiner
The Effects of a High Fat Diet and Warm Environment on Leptin in Mice
Ruth B.S. Harris and Tiffany D. Mitchell, Department of Foods and Nutrition, University of Georgia

Mice adapted to a high-fat diet are reported to be leptin resistant but we previously found that young mice fed a high-fat (HF) diet and housed at 23o C remained sensitive to peripheral leptin and lost body fat. This study tested whether increasing environmental temperature combined with a HF diet impaired leptin action by inhibiting thermogenesis. Male C57BL mice were adapted to low-fat (LF) or HF diet from 10 days of age and were housed at 27o C from 28 days of age. From 35 days of age baseline food intake and body weight were recorded for one week and then mice on each diet were infused with 10 ug leptin/day or PBS from an intraperitoneal miniosmotic pump for 13 days. HF-fed mice had a higher energy intake than LF-fed mice and were heavier and fatter. In contrast, serum leptin was lower in PBS-infused HF-fed than LF-fed mice. Leptin significantly inhibited energy intake of both LF-fed and HF-fed mice and this was associated with a significant increase in hypothalamic long-form leptin receptors with no change in short-form leptin receptor. Leptin significantly reduced body fat mass in LF-fed mice but not HF-fed mice. These results suggest that an ability to increase thermogenesis is more important in mediating the reduction in adipose tissue of HF-fed than LF-fed leptin-treated mice and that dietary fat modifies mechanisms responsible for leptin-induced changes in body composition.

Back to Authors
Back to Titles

Elizabeth Hebbard
A Pragmatic Analysis of the Variable Forms and Functions of Noun Phrases in Modern Written French

Modern French grammars tend to mention only one basic sentence structure: a transitive verb surrounded by a subject and a direct object which are encoded as lexical noun phrases. In a study of spoken French, however, Ashby (1999) found that several factors unconsciously influence a native speaker's choice as to how information in spontaneous dialogue is encoded- including its state of animation and its accessibility- and that lexical noun phrases generally do not function as subjects. In this project, I wanted to discover whether the same factors and tendencies existed in written French as well.

In order to do so, I looked to four representative pieces of literature. For each work, I recorded the first fifty lexical noun phrases, their state of activation, their possession or lack of animation, and their syntactic function. The results were surprisingly comparable with those of Ashby's study, implying that the factors that influence a native speaker's choice of sentence structure are based on an intrinsic knowledge that extends to writing as well as speech. The form, and consequently the function, of a noun phrase depends on the accessibility of the information contained therein. Frequently, noun phrases that function as subjects do not introduce new ideas, but rather given ideas; therefore they are often encoded as pronouns. Lexical noun phrases serve other functions such as direct objects and objects of presentative expressions. This proves that overly simplified constructions presented in grammars give an inaccurate impression of the way that French sentences are actually formed.

Back to Authors
Back to Titles

Christina Hendry, Rupa Patel, Susan Sanchez
Genetic Investigation of Nosocomial Infections in the Small Animal Teaching Hospital
Athens Diagnostics Laboratory; College of Veterinary Medicine, Athens Georgia, 30602

Research was conducted at the University of Georgia College of Veterinary Medicine to investigate possible opportunistic organisms and test their susceptibility to clinical antibiotics, in an attempt to quantify and localize the origin of these hospital infections. Selective screening revealed 64% of tested locations produced *Escherichia coli* and 43% resulted in *Enterococcus* sp. growth. Exposure to five antibiotics revealed 25.6% of *E.coli* were resistant to all five drugs, and 32.6% of the *Enterococcus* strains were resistant to three antibiotics. The majority of resistant *E.coli* occurred in the Surgery Ward (SW) and Radiology, with *Enterococcus* growing in the SW, ICU, and computer hallway. Resistant samples were analyzed by PCR, producing genetic fingerprints for individual *E.coli* and *Enterococcus* isolates. For *E.coli* , all locations producing multiple isolate growth had at least two or more genetically different forms. Areas producing the most diversity included Radiology, SW, and ICU, while isolates of similar or the same genetic profiles occurred between several locations, including the SW and Anesthesia floor in front of Surgery. For *Enterococcus* , 78% of locations producing multiple bacterial colonies had at least two genetically different isolates. Areas with the most diversity included the computer hallway, SW and ICU. An abundance of genetically similar profiles were found throughout the hospital and included the computer hallway and SW, and areas between SW and ICU. Resistance profiles for tested *E.coli* show 87% were positive for the *int1* gene, and 50% contained the *flo* or *ampC* gene. Data from previous screenings shows no decrease in the presence of resistant forms of *E.coli* and *Enterococcus* .

Back to Authors
Back to Titles

Luke Hoagland
The Role of Myosin II in Hirano Body Formation and the Impact of Hirano Bodies on Cell Viability
Marcus Fechheimer and Ruth Furukawa

Neurodegenerative diseases such as Alzheimer's disease are an increasing problem in our society, and are pathologically diagnosed by distinctive brain inclusions. Little is understood about actin-rich paracrystalline inclusions known as Hirano bodies. The goal of this project is to contribute to our understanding of Hirano bodies by studies of the mechanism of their formation, and their role in cell physiology. Expression of ?EF1, a gene encoding a mutant form of an acting binding protein, induces formation of Hirano Bodies in wild type cells. By contrast, no cell growth is observed if the ?EF1 protein is expressed in mutants lacking myosin II. These results suggest that myosin II is necessary for Hirano body formation, and that Hirano bodies may be adaptive structures that promote cell survival and growth. Dictyostelium cells with a temperature sensitive myosin II gene mutation will be used to test the role of myosin II in Hirano Body formation and cell physiology. At the permissive temperature, myosin II is fully functional, and these cells should grow normally and form Hirano bodies while expressing the ?EF1 protein. These cells exhibit all of the hallmarks of the

absence of functional myosin II when at the nonpermissive temperature. The myosin II protein function can be halted by simply lowering the temperature, enabling me to observe the effects of the ?EF1 protein on the cells in the absence of myosin II. Cells were transformed with plasmids to drive expression of the ?EF1 protein, and either wild type or temperature sensitive myosin II. Over one hundred clones were obtained, and they are being analyzed for growth at the permissive and non-permissive temperatures, and by electron microscopy. The prospective results of this research may elucidate the mechanism of formation of Hirano bodies, and their role in cell physiology. If the current working model that Hirano bodies are adaptive structures turns out to be correct, then Hirano bodies will be shown to promote survival of cells exposed to physiological stress. If Hirano bodies actually have a positive effect on cell survival, then these results may offer insight into the treatment of patients with neurodegenerative diseases.

Back to Authors
Back to Titles

KIT HUGHES
TAGGING *
Faculty Sponsor: Mark Callahan

Since WiFi (wireless internet access) was introduced to consumers in 1999 it has rapidly grown into an experimental medium. In the same manner street graffiti gained mainstream attention in the 1980s and 1990s when introduced into art and design. Both WiFi and graffiti are also linked by their site-specific nature; one enters into a WiFi zone to access the internet and one experiences graffiti on buildings, sidewalks, etc. Tagging is a wireless application that fuses WiFi and graffiti by allowing Internet users to cover downtown Athens with virtual graffiti.

The project allows anyone using a wireless Internet-capable (WiFi) handheld device with a Web browser to select his or her location from an online map and use a stylus to "tag" images of surrounding buildings on a handheld computer screen. The graffiti is then stored in a database and becomes part of the virtual cityscape of downtown Athens. As with traditional graffiti, each person may add to previous graffiti or create his or her own. The results are available for immediate viewing on the device and on the project's website, www.tagging.us.

Tagging is an art project straddling the genres of technophile net.art and visceral street graffiti; likewise, the technological underpinnings serve as entertainment and research. The project integrates dynamic content with motion graphics on a foundation of database technology. These three areas are reaching conventional use on the Internet but have not been fully explored in a wireless environment. While the primary objective of Tagging has been to serve as a work of art, the users of project will provide useful feedback regarding user interface preferences, bandwidth limitations, and the potential of location-based wireless technology.

Virtual vandals will have their chance at tagging Athens throughout April with handheld devices available for loan through Ideas for Creative Exploration (ICE). The month long interactive exhibition coincides with the CURO symposium.

*Tagging is a word used by graffiti artists to describe writing.

Back to Authors
Back to Titles

Steven Jocoy
Temporal requirement for the amontillado (amon) gene during development in Drosophila melanogaster

We report here the developmental requirements of the homologue of mammalian prohormone convertase 2 (PC2), amon. Animals with mutations in amon die during embryogenesis and early larval development. We have used a conditional expression system to rescue amon mutants past these early stages and to determine the

effects of amon deficiency on later developmental transitions. We show that amon mutants arrest during pupal development and fail to eclose due to defects during metamorphosis. amon mutant pupae fail to evert the head sac, to fully extend the thoracic appendages, and to develop abdominal bristles. The abdominal mutant phenotype is similar to that seen in animals treated with juvenile hormone (JH), suggesting that amon may function to process peptide hormones that regulate JH release. Currently, we are completing our analysis of amon mutant phenotypes. In addition, we are using antibodies directed against the amon protein to determine if AMON is present in neurons innervating the corpus allatum, the juvenile hormone-producing region of the ring gland.

Back to Authors
Back to Titles

Jeremy Johnson
Rocking Out the USSR: A Study of Anti-Soviet Themes in the Lyrics of the Late 1980's Soviet Underground Rock Movement in Leningrad (St. Petersburg)
Dr. Keith Langston, Department of Germanic and Slavic Languages, University of Georgia

In the late 1980's, the Soviet Union experienced rapid currents of social, economic and political change as it approached its collapse. Although glasnost' and perestroika allowed for some discussion of change, a large portion of anti-Soviet dialog remained underground. An underground culture flourished in large cities across the Soviet Union. One of the most popular vehicles of sociopolitical commentary for the underground was avant-garde rock music. Although several scholars recognize the significance of the underground movement, few have discussed the actual texts, subtexts and themes of the movement. The purpose of this paper is to uncover, explore, and analyze subversive anti-Soviet lyrical themes of the underground rock movement in Leningrad (St. Petersburg) during the last years of the Soviet Union. Primarily focusing on the works of the groups Kino, Akvarium (Aquarium), and DDT, this paper develops a dialog between underground avant-garde rock and the sociopolitical change of the time. This paper also explores the significance of Soviet underground youth culture in Leningrad with respect to the role of rock music in the making of the demise of the Soviet Union.

Back to Authors
Back to Titles

Jess Johnson
The Rise of Private Corporations in China: An Analysis of the Evolving Chinese Political Economy
Dr. Clifton W. Pannell, Department of Geography, University of Georgia

The goal of this paper is to determine the extent to which China is transforming from a centrally-directed, state-run economy into an open-market economy with a growing number of privatized businesses. The cultural and economic ties between private businesses and the local government officials are explored to determine if private businesses are truly independent of state control. Primary sources from official Chinese agencies, books, and articles from academic journals pertaining to the contemporary Chinese political economy are used for quantitative data. Discursive explanations from a variety of secondary and primary sources are examined and assessed to determine the extent of control communist party officials (cadres) exert over private businesses. My findings are based on descriptive quantitative data on the number and types of private enterprises in China seen and graphed over time as well as analysis and interpretation of narrative explanatory information from official and secondary sources. These findings suggest that in most cases private businesses thrive only if personal relationships are established with local cadres, although the specific form(s) of this state "corporatism" may vary by location. These personal relationships normally involve the private corporations making gifts to the cadres. This research indicates the emerging form of market capitalism in China differs from the western form and may also vary internally within China by region.

Back to Authors
Back to Titles

Kelly Kopf

Natural Selection for Adaptive Leaf Syndromes across a Severe Environment Gradient

Severe environmental gradients found in nature are often characterized by abrupt transitions between plant communities. These transitions represent an opportunity to understand how natural selection can lead to local adaptation and subsequent genetic differentiation and speciation. However, the presence of strong gene flow can counteract natural selection. The transition between the deciduous forest community of southeastern Lake Michigan and the dune community is especially abrupt. Although very few plants are able to grow across such a severe environmental gradient, the herbaceous plant Arabidopsis lyrata is found growing on the dune and in the adjacent forest. Given the stark contrast of these neighboring environments, there are many traits that would be expected to differ phenotypically. In order to examine this assumption, I measured flower size, glucosinolates, tissue water content, specific leaf area, date of first flower, leaf shape, leaf area, and anthocyanins. However, in a common garden experiment, only two out of the eight traits measured, leaf shape and date of first flower, showed phenotypic differentiation across the environmental gradient. This lack of differentiation in the other six traits is not surprising given previous findings of strong gene flow occurring across the gradient. The phenotypic differentiation that was found in the face of such strong gene flow strongly implicates the action of natural selection.

Back to Authors
Back to Titles

Kevin Lee

Isolation and Characterization of Anaerobic Thermophiles from Uzon Caldera
Dr. Juergen Wiegel, Department of Microbiology, University of Georgia.

The National Science Foundation funded an international, interdisciplinary Microbial Observatory Project to elucidate the microbial diversity and the dynamic relationship between thermophilic microorganisms and the biogeochemistry of selected hot springs. The research includes characterizing novel glycolytic anaerobic thermophiles. Five enrichments from samples taken from two springs (with different pH values) in the North Thermal Field were chosen for the isolation of pure cultures. Enrichments and sub-cultures were incubated under an atmosphere of Nitrogen gas at a temperature of 60°C in media with two different pH values (6.3 and 8.0); glucose, starch, fructose, inulin and maltose were used as carbon and energy sources. Microscopic analysis revealed that four of the five cultures contained multiple spore-forming, rod-shaped bacteria of varying length and diameter. The spores varied in location (center, subterminal, and terminal) and in shape (large and oval; small and round). Isolation of single-cell derived cultures is underway. The cultures did not grow well in agar solidified media suggesting that the bacteria are sensitive to conditions of lower water activity. Isolated cultures will be identified using 16s rDNA sequence analysis. Presently, observed growth behavior suggests that the cultures contain novel glycolytic anaerobic thermophiles. This research can lead to a greater appreciation for the biodiversity that exists in our world and the importance of microorganisms in geochemical and mineralogical processes.

Back to Authors
Back to Titles

Stacey Marcus

Camp Counselor Interactions during Program Activity Leadership: Guiding Staff Supervision

Administrators seek tools to help staff improve skills with campers. Interactions have been documented between elementary-school teachers and students (Stuhlman & Pianta, 2002; Pianta, Cox, Taylor & Early, 1999). Yet, little is known, and less is documented, about what interactions occur during program activity leadership at camp. The purpose of this study was to document verbal and non-verbal interactions while counselors led camp program activities to gain insight into potential staff supervision tools. Four counselors were observed leading

camp program activities at pre-selected intervals during the seven-week season at a non-profit summer camp located in the Southeastern United States. Content of the interactions between counselors and campers was subdivided as primarily instructional, group management, participatory, or social, while level of interaction was documented as non-verbal, directive/imperative, monologue, discussion, or questions (Hamilton, in review). Data was plotted within categories of interaction, activity-days, and across participants. Trends associated with activity-days hold true across participants, as well as, changes in the types of instruction used as the activity progressed during the season. This information was useful on two levels. First, developing categories of behaviors and separating them into desired/undesired behaviors served to more clearly define for the administrator acceptable performance. Second, by collecting observations the administrator has specific information for targeted performance-review with employees. Future steps in this line of research would include the expansion of the project to include multiple raters that documented both the staff interaction and camper response to that interaction.

Back to Authors
Back to Titles

Valerie Marshall
ASSESSING THE POSSIBLE LOCAL COMMUNITY BENEFITS FROM ECOTOURISM OPERATIONS IN KENYA
Advisor: Michael Tarrant

The purpose of this research is to identify ways in which ecotourism operations can benefit local communities in Kenya. In recent years, sustainable development and ecotourism in developing nations have become the new focus of these nations' attempts to preserve their resources and increase their economic stability. However, when promoting the preservation of lands in developing nations, planners must take into account the local communities who base their livelihoods and economies on natural resources. Kenya has had the longest running ecotourism operations in all of Africa, but its past is riddled with government corruption and acquisition of indigenous land, which has hurt the amount of benefits that communities can derive from wildlife protection. This paper will illustrate the range of Kenyan ecotourism operations (government, non-government, and private) and the nature of their relationship with the local people. It will also show how these local communities currently benefit from ecotourism. Considering that Kenya has several setbacks to local community benefits because it is a developing nation, a comparison with a strong ecotourism organization in a developed nation is necessary to discuss how Kenyan ecotourism can improve its local community benefits.

Back to Authors
Back to Titles

Lindsay Mason
"Bad" Girls: The Striking Epidemic of Female Juvenile Offenders
Professor Dean Rojek

Over the past decade, crime statistics for female juvenile offenders has increased dramatically, -- receiving the attention of numerous political officials, -as well as the public and media. The purpose of this study is to delve into the growing phenomena of females offenders in the juvenile justice system; address case studies; and the bias view of the 'typical' juvenile offender. After exploring a variety of studies and journal entries concerning female juvenile offenders, it is my hope to provide statistical information along with an analysis of the various types of crimes and offenses committed by youth, and draw on the increasing correlation between male and female delinquents. The purpose of the analogy is to communicate the need for more in-depth research and preventive crime programs that will education the public, and hopefully, decrease the number of girls entering into the juvenile justice system.

Back to Authors
Back to Titles

Laura Massengale
Buddhism and the Beats : « Dharma bums » or bumming around ?
Dr. Glen Wallis

How did Buddhism affect the counter-culture movement of the Beat Generation in 1950's America? This paper will analyze the works of Jack Kerouac, Allen Ginsberg, and William S. Burroughs, tracing the effects of Buddhism upon literary form, character, and theme. Through literature, I will investigate the transplanting of Eastern thought to Western philosophy, questioning whether the Beats can indeed cultivate Buddhist ideals with a Western lifestyle or if their actions assume only surface Eastern spirituality. Furthermore, if Buddhism does have a meaningful place in the movement, can the revelation and translation of a history with Eastern thought give the Beat work and lifestyle more credibility in the opinion of mainstream America? Can Eastern thought penetrate mainstream American culture through literature?

Back to Authors
Back to Titles

Jennifer McClung
The Personal and Professional Life of a Rural Mexican Primary School Teacher

This study chronicles the daily and weekly activities of Lourdes Spino, teacher of grades one through six in the coffee growing town of Chopan, Mexico. A typical week of work for Lourdes includes walking an hour to visit parents of her students, canceling classes due to unannounced district meetings, and teaching her rural students from agricultural families to think for themselves. Based on visits to the school, interviews with the teacher and all 19 families who have children attending the school, and observations of district meetings and other events, this study was conducted over a period of 5 months in the spring of 2003. A limited amount of research, mostly available only in Spanish, has been published to date on the reality of education in rural Mexico. The purpose of this project is to increase the body of knowledge regarding the lives and work of elementary school teachers in the numerous rural schools of Mexico. The presentation of this study will include photographs of the school and the students, video footage of the teacher performing her daily activities, a review of interviews with families of the community and the teacher, and some anecdotes of classroom observations which personify the teacher's work with her students.

Back to Authors
Back to Titles

Heather Mispagel
Antibiotic Resistance From Sewage Oxidation Ponds
Oconee County High School. USDA Russell Research Center, Antibiotic Resistance Research Unit (ARRU)

In an extensive, multi-year study of antibiotic resistance from sewage oxidation ponds, a mobile home park sewage oxidation pond was discharging high antibiotic-resistant bacteria levels into the Oconee River . T etracycline resistance genes C and G were detected in the 1 st and 2 nd stages and the discharge of the pond going directly into the environment. These genes are usually found in intestinal bacteria, so it can be inferred that they are from a human source. Antimicrobial residue from the beta-lactam family of antibiotics was found in all oxidation pond stages and in the creek above the pond. Tetracycline residue was found in the first and second stages of the pond. Thus, genes coding for antibiotic-resistant pathogens and the antibiotics themselves were documented to survive oxidation pond treatment.

A model simulating biofilm treatment in oxidation ponds was created using a highly antibiotic-resistant *Salmonella typhimurium 3/97* and pond water. Under optimal conditions, *S. typhimurium 3/97* remained in this *in vitro* system. Thus, the competitive inhibition process that assists in the removal of bacteria in oxidation

ponds did not effectively remove *S. typhimurium* 3/97 in this mock oxidation pond.

This bioreactor model can be used to further investigate oxidation ponds. A public awareness campaign was initiated by the author to encourage proper use and disposal of antibiotics, as flushing them is a common practice in the United States . A cost-effective technique is also needed to inactivate antibiotic-resistant bacteria and remove the antibiotics in oxidation ponds.

Back to Authors
Back to Titles

Kunal Mitra
The Impact of Indian-Americans in a Georgia Congressional District

Minority politics unarguably play a role in U.S. elections and representation, as evidenced by the courting of African-American and Jewish voters in times of election and the activism of minority interest groups on political issues. The Indian-American community in the U.S. though has only begun to use its political voice or organize a united approach to politics as other minority interest groups have. Obstacles that this minority ethnic group must face in exercising political influence include its small numbers, divided factions within those numbers, and presently a lack of significant historical precedent as to how the group should maneuver to pursue political objectives. Indian-Americans have begun to mobilize, however, and in addition to establishing national-level interest groups and voter education centers many local successes have been attained which Indian-American communities throughout the U.S. can seek to emulate. One such example can be found in the 4th district of Georgia, a majority-minority district in which an incumbent Democratic candidate Cynthia McKinney lost in the primary against Denise Majette, the latter having the support of the Indian-American community in the area. Although other organizations and voting groups are credited for the victory of Congresswoman Majette, Indian-American supporters demonstrated a unified effort and an early, organized response in the competition which indicates the continuing maturation of Indian-American politics. This new activism and organized fundraising within 4th district has caused political actors such as Congresswoman Majette to recognize the importance of this group and represent their interests.

Back to Authors
Back to Titles

Kunal Mitra
Sociocultural Influences on Healthcare in Kenya

The societal character and the numerous cultural influences that color the citizenry of Kenya make a powerful impact on the structure and efficacy of public healthcare systems in the nation. In dealing with public health issues ranging from family planning to malaria and tuberculosis epidemics, public officials must carefully choose their strategies in order to harmonize with the sociocultural environment while carrying out the task in question. This study observes the impact of various components of the sociocultural atmosphere, including tribal culture and taboos, the influences of colonialism, the arrival of new ethnicities, and religious belief, on the workings of Kenyan public sector health programs. Through participant observation in community medicine and health education programs and via personal interview of health agency officials, medical doctors, and rural health workers, the sociocultural environments throughout Kenya are analyzed and evaluated in terms of the implications for success of various public health initiatives. Continuing to research these influences on the healthcare infrastructure and efficacy will allow Kenyan health officials to better confront the massive public health problems that face the nation today. A better understanding of the sociocultural milieu will allow more effective programs to be designed which do not clash against, but rather fit with and persuasively transform when necessary, the outlook and beliefs of citizens targeted by public health initiatives.

Back to Authors
Back to Titles

Joseph Moore and Crystal Oliver
Microarray analysis of 100M and 58M Sorghum bicolor cultivated under variable light stimuli.
Dr. Lee H. Pratt

In plants, the perception of light and shade is mediated by the phytochrome photoreceptor system. Th phytochrome molecule exists in two interconvertible forms, red light absorbing (Pr) and far-red light absorbing (Pfr) (Furya and Song, 1994). Chlorophyll strongly absorbs red photons, and plant subsequently sense this aspect of light quality. Recently, phytochrome deficient mutants have been recognized as powerful tools in the assignment of the individual function of each member of the phytochrome photoreceptor system, as well as genes that are potentially involved in downstream signaling mechanisms and physiological molecular responses (Correll *et al.* , 2003). Our project seeks to characterize the differential gene expression between wild type and phytochrome B-deficient *Sorghum bicolor*. Sorghum strains 100M (wild type) and 58M (phytochrome B-deficient) are nearly isogenic. Both were grown under light and dark conditions to determine if a mutation in the phytochrome B receptor affects a plant's perception and responses to a given light stimulus. RNA microarray technology has been employed to produce gene expression profiles of the mutant and wild-type sorghum. By analyzing this data using bioinformatics software (Spotfire: http://www.spotfire.com/) we hope to determine the effect of mutant phytochrome B, and its associated receptor genes, on a plant's light responses and growth.

Back to Authors
Back to Titles

Ashley Neary
Diagnosis of Equine Fungal Keratitis Using Polymerase Chain Reaction
Dr. Susan Sanchez, Department of Medical Microbiology and Parasitology, College of Veterinary Medicine, University of Georgia

Currently cytology, culture, and histopathology are the only diagnostic methods available to identify fungal pathogens associated with keratomycosis (G. *keras* = cornea + *myk e s* = fungus). The purpose of this study was to evaluate polymerase chain reaction (PCR) as a method for early and rapid detection of equine fungal keratitis. The yeasts *Candida albicans* and *Cryptococcus neoformans*, and the filamentous fungi *Aspergillus* , *Cladosporium* , *Fusarium* , and *Penicillium* were used to evaluate universal primers. Genus specific primers were tested against *Candida albicans* (ATCC 10231), and *Aspergillus* and *Fusarium* isolates . PCR using universal fungal primers targeting the conserved regions of ITS1 and ITS2 and genus specific primers were performed on 22 cases of equine keratitis. Fungal PCR (n=22) results were compared to those of corneal cytology (n= 22), fungal cultures (n= 22), and histopathology (n=16). PCR results were positive for universal fungal primers or genus specific primers in 81.8% (n=18/22). Corneal cytology was positive for fungal hyphae in 63.6% (n=14/22). Fungal cultures were positive in 50.0% (n=11/22). Histopathology confirmed the presence of fungi in 43.8 % (n=7/16). Of the 15 cases positively identified with fungal organisms by cytology, fungal culture, or histopathology, 86.7% (n=13/15) were positive by PCR. Of the 7 samples negative for fungal organisms by cytology, fungal culture, and histopathology, 71.4% (n=5/7) were positive by PCR. Of these five cases, four were clinically agreeable with fungal keratitis [stromal abscess (n=3) and deep progressive corneal ulceration (n=1)]. When used in conjunction with cytology, culture, and histopathology, PCR with universal and genus specific fungal primers is a promising tool to aid in the diagnosis of equine fungal keratitis.

Back to Authors
Back to Titles

Ngozi Ogbuehi
Comparing Apoptosis During Different Stages of Limb Development in Chick Embryos
Mary Alice Smith, PhD - Environmental Health Science

Apoptosis, or programmed cell death, is essential in embryonic development and for normal development of

limbs, including deletion of interdigital webs and shaping of limbs. Limb deformities result from too much or too little apoptosis. Using chick embryos as an animal model, our hypotheses were that there is a difference in apoptosis 1) during important stages of limb formation in chick embryos and 2) in the developing fore and hindlimbs. Fertilized eggs were incubated at 37ºC. At the appropriate stage, the embryo was aseptically removed, and fore and hindlimbs were dissected. DNA was extracted using a GeneChoice™ kit. Polymerase Chain Reaction (PCR) was done using a Maxim Biotech TM kit. PCR was used to amplify DNA undergoing apoptosis. PCR results were subjected to gel electrophoresis and the appearance of bands compared to a positive control was used as evidence of apoptosis. The number of PCR cycles was used to quantify the results. The results for stage 25 varied and may reflect differences in populations of cells undergoing apoptosis. More apoptosis occurred at the later stage of development (stage 27) compared to earlier (stage 26), and for stage 27, there was more apoptosis in the hindlimbs than forelimbs. These results suggest that teratogens affecting apoptosis are likely to be more detrimental to the developing limbs during stage 27 and in hindlimbs.

Back to Authors
Back to Titles

Julie W. Orlemanski
CASTING THE SHUTTER: SURREALISM, POLITICS, PHOTOGRAPHY
Dr. Jed Rasula, English Department, University of Georgia, Athens, Georgia, 30602

This paper will examine the Surrealist use of photography and the political role of the photograph as a form of representation within the Surrealist movement. The Surrealist moment is significant in the history of the theory of the photograph because so many critics have looked back to the Surrealists to interpret their legacy in divergent ways – placing emphasis alternately on the Surrealists' critique of representation and their strategic use of representation in conjunction with a debatably Marxist critique of bourgeois society. The paper will include primary texts, mainly from the Surrealists, including British and American artists such as Man Ray, Lee Miller, and Roland Penrose, as well as read seminal works of photographic theory and criticism and notable accounts of Surrealism. The topic of photography is a subject applicable to any engagement with Modernism and modernity, in that the technology of photographic representation is part of a fundamental break in the means of mimetic representation. In addition to engaging the concerns of literary theory and contributing to an understanding of Surrealism and modernity, this paper will specifically look at American and British surrealists and the relation of their Surrealist conceptions of photography to the documentary trends popular in the USA and UK. By centering my paper on the moment Surrealism and examining photographic theory before, during, and after the Surrealist period, I hope to provide a means for examining the different perspectives on the political role of photographic art.

Back to Authors
Back to Titles

Charles John Paetsch
From whence did Neo-Plasticism Spring?
Supervising faculty: Dr. Thomas Polk, Art History

From the essential planarity of his early naturalistic landscapes to the pure abstractions of his final two decades, the corpus of Dutch Modernist painter Piet Mondrian's work follows such a clear path that traces of his final work can be found in each progression of style. This evolution was primarily propelled by his motto "always forward." The accepted hypothesis seems to be that each transition came about by a revelation in form which enabled him to articulate better the theosophical ideas of Helena Blavatsky which enthralled him from his early years. This gradual development theory seems to be true superficially; however, there is significant evidence, specifically in his own essay "Natural Reality and Abstract Reality", to suggest that major conceptual shifts came about in sudden upward spurts rather than through the gradual evolution espoused by most. If this is true, their will certainly be major events which spurred his push to higher abstraction. I will first attempt to extract explanations from Hans Jaffe's biographical sketch to determine which biographical, intellectual, or artistic

events, if any, led to each change in form. If however the gradual evolution theory proves to be true, this would mean that his conceptual vision of a pervasive spirit was attained early but was simply not able to be articulated. If this is the case, the research will attempt to illuminate what events and influences allowed him to maintain this conceptual rigidity even while the attempts to express himself were frustrated.

Back to Authors
Back to Titles

Kevin Patrick
Marcus Tullius Cicero's "Pro Archia Poeta": The Poetics of Law in the Roman Republic
Dr. James C. Anderson Jr., Classical Culture, University of Georgia

Reflecting the mounting conflict amidst the militaristic innovation of Cnaeus Pompeius and the oligarchic sentiments of Lucius Licinius Lucullus in 62 B.C.E., the poet Archias, Marcus Tullius Cicero's childhood tutor, faces prosecution based on the tribunal law of Gaius Papius expelling non-Roman citizens. While Cicero's defense of Archias's citizenship depends upon the Lex Julia and the Lex Plautia Papiria, Cicero focuses on Archias's status as a heralded Roman poet. Thus, "Pro Archia Poeta" illuminates Cicero's perceptions regarding the literary foundations of an education and the implications of a political career. By emphasizing notions of glory, honor, and duty in the Roman Republic, "Pro Archia Poeta" establishes the preeminence of literature within a legal education.

Back to Authors
Back to Titles

Melissa Payton
Predictors and Outcomes of Networking Behavior Among Recently Laid Off Employees

Networking is a successful job-search method for attaining reemployment (Wanberg, Kanfer, & Banas, 2000). Despite the fact that there have been many studies examining the effectiveness of networking among the unemployed, little attention has focused on how individuals network. To address this gap in the literature 146 recently unemployed individuals completed a survey regarding how intensely they network as well as the quality of their networks. Participants also provided socio-demographic (i.e., age, race, gender) and personality information. Factor analysis of the networking measure indicated that networking is a multidimensional construct represented by networking intensity, networking breadth, and quality of information obtained from networks. In terms of individual difference factors that might be linked to how one networks, significant findings include a positive relationship between proactive personality and networking intensity (ß=.184, p=.025) as well as a positive relationship found between proactive personality and quality of information (ß=.210, p=.010). In addition, age was found to have a significant curvilinear effect on network breadth; younger and older employees reported less breadth in their networks, whereas middle-aged individuals reported high network breadth. Finally, there was a significant interaction found between proactive personality and age when correlated with each of these two dependent measures. Together, these findings will hopefully lead outplacement services and career counselors to a better understanding of how individuals network and what they can do to modify their behavior so that networking will be successful in leading to reemployment.

Back to Authors
Back to Titles

Lisa Jane Plummer
Mapping of the Yeast Ras Converting Enzyme Active Site
Dr. Walter K. Schmidt, Department of Biochemistry and Molecular Biology, University of Georgia

Rce1p mediates the proteolytic step in the modification of Ras proteins. Because these post translational modifications modulate the biological function of Ras proteins, the inhibition of these modifications has been

viewed as a possible anticancer strategy. The catalytic mechanism of Rce1p is undefined. Protein alignments of Rce1p orthologs from several different species reveal twenty-one conserved residues that are potentially critical to Rce1p catalysis. We hypothesize that residues conserved in the Rce1p family are part of the yet to be identified Rce1p active site and that the active site is on the cytosolic face of Rce1p, which is an endoplasmic reticulum localized membrane protein that is predicted to have multiple membrane spans. Using a site directed mutation approach, we have identified certain invariably conserved histidine and glutamic acid mutations that are essential for Rce1p activity. By contrast, a cysteine and several other conserved residues are not critical for activity. The cysteine mutant in particular challenges a published finding that Rce1p is a cysteine protease. To further support the importance and relevance of the conserved histidine and glutamic acid residues to enzyme function, we have partially mapped the topology of Rce1p. Using a topology reporter, our results support that certain critical amino acids are likely cytosolically disposed and contribute toward the Rce1p active site. We have determined that the first predicted loop and the C-terminus of Rce1p are located in the lumen of the endoplasmic reticulum. We have also determined that the last transmembrane segment and lumenal tail of Rce1p are dispensable for activity.

Back to Authors
Back to Titles

Lauren Popiolek
Effects of endothelin and cyclooxygenase inhibition on canine prostate cancer growth and invasion
Dr. Bruce LeRoy, Pathology, Veterinary Medicine, The University of Georgia

Prostate cancer is very common in American men. Dogs also develop prostate cancer, and are excellent experimental models for studying prostate cancer. Despite research efforts, the growth factors important for canine prostate cancer are still unknown. Dr. LeRoy's laboratory has shown that canine prostate cells produce endothelins, which are critical in the growth of metastatic prostate cancer cells in men. Additionally, other researchers have shown that canine prostate cancer cells produce cyclooxygenases-1 and -2 (COX-1 and COX-2). The goal of this project is to evaluate the effects of an endothelin receptor antagonist (ABT-127) and a cyclooxygenase inhibitor (piroxicam) on the growth and invasion of a canine prostate carcinoma cell line (MAX-1) developed in Dr. LeRoy's laboratory.

Following incubation with vehicle (control) or ABT-127/piroxicam, an MTT assay (Promega) will be used to evaluate the effects on MAX-1 cell proliferation. Effects of inhibitors on cell invasion will be measured using 24-well transwell plates with a polycarbonate membrane (Corning). MAX-1 cells will be loaded in the upper chamber, and vehicle or the inhibitors will be added to the lower chamber of the plate. Cells migrating into the lower chamber will be counted. Each assay will be performed in triplicate. Differences between control and experimental groups will be determined using Student's *t* test (SigmaStat). P values less than 0.05 will be considered significant.

Results of these experiments could demonstrate endothelins and cyclooxygenases are critical for the growth and invasion of canine prostate cancer. This project could also provide valuable insight to the effects of specific growth factor inhibitors and their use as prostate cancer treatments.

Back to Authors
Back to Titles

Katherine Price
Characterization of Chromosomal Integration by Streptomyces Bacteriophages: use in mammalian genetic engineering.
Janet Westpheling, Genetics Department, University of Georgia.

Recombinases (integrases) are enzymes that facilitate exchange between DNA molecules. Integrases derived by *Streptomyces* phages (viruses that infect these bacteria) have been shown to mediate efficient site-specific recombination in mammalian cells. Michele Calos and her colleagues at Stanford University have constructed cloning vectors containing *Streptomyces* bacteriophage integrases and used them to engineer mammalian chromosomes providing a safer nonviral approach to human gene therapy. Vectors containing the attachment sites of phages f C31 and R4 have been shown stably integrate into pseudo attachment sites found on mammalian chromosomes. We have recently isolated and characterized several new temperate phages from *Streptomyces species* and have begun an analysis of the mechanism of phage integration. Putative lysogens were isolated as turbid plaques and tested for the presence of phage by mitomycin C induction. Restriction analysis of released phage confirmed that the lysogens contained the phage used for infection. Libraries of phage DNA are being constructed in non-replicating plasmid vectors to functionally identify the presence of the integrase gene and phage attachment site. Our plans to manipulate these phage components for use in mammalian cell engineering will be discussed.

Back to Authors
Back to Titles

Drew Proser

Kin Recognition in *Drosophila paulistorum*

Kin recognition serves as an inbreeding avoidance mechanism, which is key to maintaining the overall fitness of a species (Hamilton , 1964). It has been demonstrated that *Drosophila paulistorum* , when given a choice, prefer to mate with genetically non-related individuals rather than with siblings (Kim, in press). Further, when non-siblings were raised together, they had reduced sexual activities and consequently avoided mating. In an attempt to further study this kin recognition in *D. paulistorum,* I have investigated 1) whether this recognition is based solely on familiarity with individuals experienced during early development or 2) whether there is a genetic effect on kin recognition utilizing two types of *D. paulistorum,* an old strain maintained in the lab for many generations and a new strain that was recently collected in nature. I raised them in four different treatments; 1) siblings raised apart communally (SRAC), 2) half-siblings raised apart communally (HSRAC), 3) cousins raised apart communally (CRAC), and 4) non-siblings raised apart communally (NSRAC). These groups are only different in their genetic relatedness and they have no prior contact with non-related individuals. In the female choice situations, one female was placed with a sibling male and a half-sibling male (HS tests); one female with a sibling male and a male cousin (C test); one female with a male sibling and a non-sibling male (NS test), respectively, without prior experience of either male. I observed whether the female mated with her sibling or the distantly related male. Current data show that there are no significant differences in mate choice between sibling and individuals who are different in degree of genetic relatedness (c 1 2 =0.03, ns for HS; c 1 2 =0.81, ns for C; c 1 2 =0.00, ns for NS for the old strain; c 1 2 =2.00, ns for HS; c 1 2 =0.76, ns for C; c 1 2 =1.58, ns for NS for the new strain). There were no significant differences in mate choices treatment groups (c 2 2 =0.68 for old strain; c 2 2 =3.97 for new strain). These results support my hypothesis that *Drosophila* kin recognition is based on familiarity acquired during developmental experience rather than genetic relatedness.

Back to Authors
Back to Titles

Jessica Quinlan

Photochemistry of Benzoyl-substituted Ruthenocenes

Photointiators are compounds that intitate chemical reactions upon irradiation with light and are useful in many real-world applications such as optical imaging and light curable coatings or adhesives. Benzoyl-substituted ruthenocene compounds were investigated as anionic photoinitiators for the polymerization of ethyl 2-cyanoacrylate. Placing a benzoyl group on one or both cyclopentadienyl rings of ruthenocene, Ru(?5-C5H5),

causes significant changes in the electronic transitions observed in the uv-vis spectral region. While the parent metallocene displays low-intensity, solvent-insensitive ligand field absorption bands, benzoylruthenocene and 1,1'-dibenzoylruthenocene exhibit bands that are much more intense and sensitive to the solution environment. This behavior has been attributed to the mixing of appreciable metal-to-ligand charge transfer (MLCT) character into the low-energy excited states of the benzoyl-substituted complexes. Resonance Raman spectroscopy was used as an analytical method to probe the nature of the excited state and confirmed this MLCT assignment. Irradiation of 1,1'dibenzoylruthenocene in ethyl 2-cyanoacrylate results in the anionic polymerization of this electrophilic monomer. The kinetics of this photoinitiated process were investigated using total reflectance infrared spectroscopy. Finally, a possible mechanism of this process is proposed and compared with that previously proposed for the analogous ferrocene compounds based on the excited state properties of both compounds.

Back to Authors
Back to Titles

Christopher A. Ratke
Globalization and the Process of Inequality

It is readily apparent to anyone who checks a manufacturing tag, watches the nightly news, or listens to a politician, that the world is in the midst of the era of globalization. Even though the term has become somewhat of a buzzword, especially among politicians, businesspeople and journalists, the effects of globalization are still being scrutinized to better understand what they entail and what they imply. One of the most pressing matters concerning the process of globalization involves the creation or perpetuation of inequalities. These inequalities create classes of winners and losers who unfairly benefit or suffer by participating in the process of globalization. The purpose of my research is to assess empirical data that demonstrates a causal relationship between globalization and various forms of inequality. If one considers globalization as a "supraterritorial" process in which actions taken on a local scale have global implications and vice versa, one can identify inequalities that occur at the international, national, and local level due to globalization. While the world today is in the throws of such a sweeping process, it is vital to understand what is going on around us and why, so that people are not, in a sense, thrown off the "train" of globalization, or simply left behind. At the conclusion of my paper I expect to present a clear relationship between globalization and the generation of inequality and what this relationship implies for the future of this global process.

Back to Authors
Back to Titles

Charles Ratliff
The U.S. Government vs. The National Football League: How the Government Decided to Regulate the League's Television Policy

This paper analyzes the development of the National Football League's (NFL) television policy from 1949 until the Federal Court ruling in 1953 established the parameters for broadcasting NFL games. A central focus will be on investigating why the U. S. government got involved in regulating the NFL's television policy. Four themes will guide the narrative: the NFL's early relationship with television; the factors that led to NFL Commissioner Bert Bell revising the league's television policy; the forces that led to government intervention into the NFL's television policy; and the impact of the 1953 court ruling. Bert Bell's efforts to revise the NFL's television policy coincided with the emergence of the television industry and their attempts to develop their programming niche, and the simultaneous efforts of the US government to regulate the airways. When Bell attempted to regulate NFL broadcasts, the US government viewed this as a violation of the Sherman Antitrust Act. The NFL was found in violation of antitrust laws, but Judge Allan K. Grim allowed the league to blackout home games within a 75-mile radius. Despite this setback, Bell saw this ruling as a victory because the league won its most important point – the blackout of home telecasts.

Back to Authors

Back to Titles

Ryan Rhome
Purification and Caracterization of *BkdR* Protein in *Streptomyces coelicolor*

One of the biggest problems facing medicine today is increasing bacterial resistance to antibiotics. The solution may be found by manipulating the natural product biochemical pathway of *Streptomyces* , a soil organism that produces most of the known antibiotics. In order to use this pathway to create novel antibiotics, it must be fully analyzed because the antibiotics can only be created *in vivo* . Mutations in genes that control the branched chain keto acid dehydrogenase complex (bkd) eliminate antibiotic synthesis; therefore bkd is the first choice for further experimentation. Based on predicted structure of the protein and the activity of known homologous proteins in other species, bkdR is hypothesized to be the regulator of the gene and would therefore be the first step in the full analysis of the pathway. Starting with this proposed regulator protein, the components of the pathway will be assayed for biochemical activity. This possible regulator gene was cloned into a vector using restriction digestion and amplification in *E. coli* cell cultures. The vector is designed to add an amino acid tag to the protein product that will allow easy purification. After this purification, the protein will be categorized for many different activities, including DNA binding studies. Also a complementation study is underway to show that the tagged version of the protein functions normally in vivo. In addition to testing the biochemical properties of bkdR, analysis of promoter mutants can be used to determine what cell signals are used and what other proteins interact with bkdR. These studies would determine the direction and scope of further experiments.

Back to Authors
Back to Titles

Michael H. Robinson
GIS and Field-Based Analysis of the Impacts of Recreational docks on the Saltmarshes of Georgia
Applied Coastal Research Laboratory, Georgia Southern University, 10 Ocean Science Circle, Savannah, GA 31411 and Clark R. Alexander, Skidaway Institute of Oceanography, 10 Ocean Science Circle, Savannah, GA 31411

Population pressure along the Georgia coast has greatly increased the number of docks that extend across the marsh, impacting marsh ecosystems through shading. To understand the patterns and impacts of dock proliferation, aerial photography and field data were used within a geographic information system (GIS) to quantify salt marsh area directly affected by docks. Maps showing the footprint of docks from 1970 to 2000 on Wilmington Island, GA, were created to quantify changes in dock area. These maps document an 89% increase in total dock area and a 74% increase in number of docks during this period. Indicators of shading impacts (e.g., plant height and stem density) were quantified for salt marsh grasses beneath and adjacent to docks from a range of time periods, dock orientations and dock heights. Average vegetation stem density was 50% lower beneath docks than measurements adjacent to docks. This study provides baseline and trend data regarding dock impact and proliferation, provides guidance on potential impacts of docks on estuarine productivity and will be a valuable tool for coastal managers in assessing the cumulative impact of these activities.

Back to Authors
Back to Titles

Sarah E. Sattelmeyer
DATING, MATING, AND PROCREATING: DARWIN IN THE VICTORIAN NOVEL
Richard Menke, Department of English, Franklin College of Arts and Sciences, University of Georgia, 254 Park Hall, Athens, Georgia 30602-6205

Nineteenth-century England was a time and place of scientific exploration and literary innovation, both of

which are blended in Victorian fiction. Victorian novelists took a special interest in the ideas of Charles Darwin, a nineteenth-century naturalist whose work The Origin of Species inspired Herbert Spencer to coin the phrase "survival of the fittest." Victorian novelists often examined the bleeding of evolution into the social sphere of fiction and whether organisms compete and adapt to social as well as physical environments. By definition, evolution is successful if an organism's genes will be passed to the next generation. If an organism also evolves socially, the processes of courtship and marriage make humans "not only animals but cultural animals" that use instinct as well as consciousness and cultural ideas in their sexual selection (Dickens 16).

This paper explores the relationship between Darwin's theory of evolution and the evolutionary process and the social realm of the Victorian novel. Characters and events from Jane Austen's Sense and Sensibility through George Eliot's Daniel Deronda portray popular Victorian sentiments. These sentiments range from feelings about the "pre-Darwinian" thought of Lamarck and Erasmus Darwin to Charles Darwin's The Origin of Species and provide a window into how Darwin's subsequent theory of evolution impacted Victorian society.

Dickens, Peter. Social Darwinism: *Linking Evolutionary Thought to Social Theory.*

Buckingham: Open UP, 2000.

Back to Authors
Back to Titles

Kristen Scarbrough
Development and Improvement of Assays for the Early Detection of Cancer
Dr. J. David Puett, Department of Biochemistry and Molecular Biology, University of Georgia

Trophoblastic malignancies such as choriocarcinoma have been associated with the production and secretion of hyperglycosylated isoforms of the pregnancy hormone, human chorionic gonadotropin (hCG). The identification of such glycoproteins is becoming increasingly important in the development and improvement of tumor marker assays and key in the early diagnosis of cancer. Currently, this research project is primarily focusing on the analysis of pregnancy-derived hCG isoforms and their potential discrimination from trophoblastic malignancy-derived hCG. Thirteen pregnancy urine samples were obtained from patients at the Athens Women's Clinic and analyzed on the BIAcore to determine the concentration of hCG in each urine sample, as well as the various hCG glycosylation isoforms. In this assay, hCG is captured by a modified monoclonal antibody and then probed with various lectins, i.e. carbohydrate-binding proteins. The identification of the different hCG isoforms was performed by injecting several types of lectins, including *aleuria aurantia lectin* (AAL), *galanthus nivalis lectin* (GNA), and *sambucus nigra lectin* (SNA), on the BIAcore after every urine injection. The data gathered from these and other experiments with urine from cancer patients will be used in the development of assays for the early detection of cancer. Even though this research project is currently exploring hyperglycosylated hCG isoforms as potential tumor markers, the project will expand to include the investigation of glycoforms of PSA, CEA and CA-125 as tumor markers. Serum and urine samples from patients with a variety of cancers will be analyzed on instruments such as the BIAcore and the Immulite, which use surface plasmon resonance and fluorescence-based assays, respectively, to detect tumor marker proteins with aberrant glycosylation patterns.

Back to Authors
Back to Titles

Jeffrey R. Seay
Functional analysis of Ubc2, a putative novel adapter protein in *Ustilago maydis*
Dr. Scott E. Gold, Department of Plant Pathology

The fungus *Ustilago maydis* is the causal agent of corn smut. This fungus alternates between a haploid, budding

saprophytic form found in the soil and a pathogenic filamentous form that invades corn tissue. The *ubc2* gene encodes a protein involved in the MAP kinase pathway controlling mating and morphogenesis . *Ubc2* is a critical virulence factor that encodes a protein possessing four protein interaction domains. Site-directed mutagenesis and complementation studies indicated that certain amino acids within the Sterile-Alpha-Motif and Ras association domains are critical for complementation and hence Ubc2 function. The yeast two-hybrid assay was employed with *Ubc2* as bait to identify interactions between Ubc2 and other proteins in the MAP kinase pathway. Targeted two-hybrid studies revealed that Ubc2 interacts with Ubc4 MAPKK Kinase and that SAM domains at the N-termini of the Ubc2 and Ubc4 proteins mediate this interaction. These results contribute to the overall understanding of morphogenesis in Ustilago.

Back to Authors
Back to Titles

Amy Sexauer, Daniel J. King, Bruce Seal, Ivomar Oldoni, and Corrie Brown
Immunohistochemical detection of various recombinant Newcastle disease virus strains in embryonated chicken eggs

Newcastle disease (ND) is a poultry disease caused by strains of Newcastle disease virus (NDV), a member of the genus Avulavirus, family Paramyxoviridae. The presence of ND must be reported to the Office International des Epizooties, resulting in financially damaging trade embargos. NDV isolates are typically classified on a scale ranging from least virulent (lentogenic) to most virulent (velogenic). In this study, four viral strains were used: rLa Sota (infectious clone of the lentogenic La Sota strain), rBC (infectious clone of velogenic Beaudette C strain), rLa Sota with BC HN (rLa Sota with virulent BC hemagglutinin-neuraminidase (HN) gene insert), and rBC with La Sota HN (rBC with lentogenic La Sota HN gene insert). Four groups of nine-day-old White Leghorn embryonated eggs were inoculated with the four viral strains, and at 24, 48, and 72 hours post infection both embryo tissues and chorioallantoic membrane (CAM) were harvested from each egg. Tissues were examined immunohistochemically using an antibody to a NDV protein. Embryos infected with rLa Sota had viral protein only in epithelial cells of the CAM. Embryos infected with rLa Sota with BC HN had viral protein found in CAM epithelium, subepithelial cells, and some embryonic tissues. Both embryos infected with rBC and rBC with La Sota HN demonstrated viral protein in CAM epithelium, subepithelial cells, and in embryonic tissue. It can be concluded that in the embryo, the presence of the virulent HN gene is not necessary for extensive tissue invasion and dissemination of the virus.

Back to Authors
Back to Titles

Katherine Sheriff
Georgia's Water Wars: Are Permit Transfers Sound Water Policy?

Decades of population and economic growth exaggerated the existing strain on Georgia's water resources. The purpose of this research was to examine legislation in the 2003 legislative session, specifically, the policy of transferring water permits. House Bill 237 included the controversial strategy of legitimizing water permit transfers in which a person or entity that presently has a permit would be allowed to transfer or to sell rights to some, or all, of the capacity under the existing permit.

Qualitative, primary research was conducted predominantly through interviews with the Georgia legislature and involved lobbyists as well as the attendance of Senate Natural Resources Committee meetings during the 2003 legislative session. Interviews provided differing views to assess the potential effects of permit transfers. Through this analysis, conclusions were drawn as to the possible benefits or costs of allowing permit transfers in Georgia.

Even though concerns of possible problems associated with permit transfers sparked much debate, the most significant argument is whether water rights belong to the public or could be marketed as a private commodity.

After thorough analysis of an array of relevant ideas and arguments, I conclude that, in a capitalist society, markets are the key to economic freedom and represent the economic philosophy of the United States. Creating a market for permit transfers would further economic progress while allocating water to those users who could no longer get permits.

Back to Authors
Back to Titles

Katherine Sheriff
Negative Campaigning in the Georgia 2002 Elections: An Analysis of Scholarly Research in the Context of Real Campaigns

Negative campaigning changed the face of Georgia politics throughout the last twenty years. Due to the public policy implications and increasing frequency of negative advertising as an attack vehicle, scholars engaged in research studying different areas of negative advertising. The purpose of this research is to examine selected 2002 Georgia elections and review specific scholarly studies to determine the effects of attack advertising in the context of real campaigns. Although quantitative data such as election results enriched the research, this study is based primarily on qualitative research derived from personal interviews, newspaper sources, relevant scholarly literature, campaign materials, and advertisements. The examined elections included the Governor's race between Roy Barnes and Sonny Perdue, the State Senate race between Doug Haines and Brian Kemp, the State Senate Primary race between Joyce Stevens and Renee Unterman, and the U.S. Senate race between Max Cleland and Saxby Chambliss. Results show that the use of negative campaigning is increasing and that the characteristics of candidates most likely to use attack advertising in Georgia campaigns are consistent in real campaigns. Findings from scholarly research are demonstrated, specifically, negative advertisements are highly effective during campaigns and seem to lead to electoral victories. Likewise, the traditional view that extreme negativity in advertisements could yield negative effects on the sponsor is disproved due to the phenomena of the sleeper effect which depletes any backlash to the source without diminishing the negative message. These findings create interesting positions for future candidates, the public, and the media.

Back to Authors
Back to Titles

Irene Shtrulis
Recovering Self

Recovering Self, written as an undergraduate honors thesis in creative writing, consists of two parts. The first part entitled "Writing to Permeate Cultural Borders: Analysis of *Mango Street*" reviews and analyzes the themes and composition of The House on Mango Street, authored by Sandra Cisneros, and serves as the introduction to the ensuing collection of short stories. It also focuses on multicultural individuals' ability to serve as intercultural mediators, or liaisons among different groups, through writing and rhetoric. The second part of the thesis consists of a collection of short stories, or vignettes that are subdivided into three logical sections: Departure, Arrival, Recovery; the stories are original pieces that focus on a young immigrant's memories and her search for identity. This search for identity delves into the young girl's past and implicitly reconstructs her life through the readers' eyes. Throughout the work, the search for identity is an active process as it presents situations to which readers can relate or empathize with. The stories, while written in a unique style, were inspired by Cisneros's composite novel. Thus, Recovering Self echoes the themes and mimics the format of The House on Mango Street. The overall theme of the entire work lies in its multicultural appeal. Both the critical review and the actual vignette collection deal with the notion of being an intercultural mediator, a role in which one produces work that will increase knowledge and understanding between different ethnic groups through the human ability to relate to similar events in life.

Back to Authors
Back to Titles

Michael Smilley
Sulfur Isotope Analysis of Alteration Minerals in Balekasir area, Northwest Turkey
Dr. Paul A. Schroeder, Geology, University of Georgia

Halloysite is an economically important kaolin group clay mineral used widely in the ceramics industry. As part of a study to understand the viable extent of this natural resource in northwest Turkey, samples were collected in March, 2003 near Turplu in the Balekesir region. The purpose of this study is to characterize mineralogical and chemical properties of the deposits using X-ray diffraction and stable isotope analysis. Alunite, halloysite, gypsum, quartz, plagioclase, and pyrite were found to be the dominant phases. Sulfur was extracted from alteration minerals for the isotope analysis using a combustion method. A gas-source mass spectrometer was then used to quantify the ratio of 34 S to 32 S (i.e., d 34 S values) within each sample.

Alunite samples, when compared to coexisting pyrite, were greatly enriched in 34 S while other alteration minerals were only slightly enriched in 34 S. Analysis yielded a d 34 S Pyrite value of 0.64 and alunite, gypsum and jarosite d 34 S values of 7.81, 2.99 and 2.61. When compared to values from other hydrothermal systems around the world, these data suggest a mixed origin of rock altering sulfuric acid in the system. Through study of the alteration minerals the mode of genesis of the deposit is now better defined. This is important because it indicates that the extent of the halloysite deposit has the potential for future economic sustenance in the region.

Back to Authors
Back to Titles

Angelique Smith, Mary Washington, Nasreen Bano, and Tim Hollibaugh
Microbial Diversity of Sediment in Mono Lake, California
Department of Marine Sciences, University of Georgia, Athens, Georgia 30602

Mono Lake is an alkaline (pH 9.8), hypersaline (salinity >80ppt), closed basin lake located in central California. Extreme environments, such as Mono Lake, contain many unique microbes. Recent studies have shown that 75% of the 16S rRNA sequences recovered from Mono Lake water clone libraries were distinct at the genus level or higher when compared to known sequences. There is not much known about the microbes inhabiting Mono Lake sediment. We analyzed the microbial diversity in a sediment core (2 cm to 45 cm below sediment surface) collected from station 6 at Mono Lake during August 2002. Denaturing Gradient Gel Electrophoresis (DGGE) and 16S rRNA clone libraries were used to examine microbial community diversity. DGGE fingerprinting showed differences in banding patterns between depths. 16S rRNA clone libraries were constructed from samples taken at 15cm and 24cm of the 2002 core. A total of 14 clones from 15cm and 22 clones from 24 cm were analyzed. The 15 cm clone library was dominated (23%) by Picocystis chloroplast sequences, whereas the 24 cm clone library was dominated (50%) by a Synechococcus-like cyanobacteria. The other major group (23 and 18%, respectively) found in both clone libraries was related to low G+C-Gram-positive bacteria which is also found in Mono Lake deep water. Other sequences found were related to ?????? and ?-Proteobacteria, CFB, Verrucomicrobiales, and candidate divisions. Ongoing work is focused on analyzing the microbial diversity of a 2003 sediment core. Our results concluded that Mono Lake sediment contains some unique microbes. Other sediment microbes were similar to those found in the overlying water. This study will provide a better understanding of the structure of microbial communities in salt lake sediment.

Back to Authors
Back to Titles

Solomon B, Wilson M, Dozier S, McCully K.
Internal Muscle Architecture During Isometric Contractions of the Quadriceps Muscle with Varying Force.

Exercise Science Department, University of Georgia, Athens, GA 30601.

Many explanations of muscle characteristics in humans are explained by external movement; however, a closer look at internal measurements may provide a better understanding of these characteristics. The purpose of this study was to quantify internal movement during isometric contractions at varying force levels.

METHODS: Six healthy young (20 – 28 years old) males were tested on two different days. The subjects preformed voluntary isometric contractions of the quadriceps muscle with 70 degrees flexion. B-mode ultrasound images of the vastus lateralis were taken at 10, 20, 30, 40, and 50 percent of MVC. Images were analyzed for muscle thickness, pennation angles, fascicle length, and excursion of a central tendon during the contraction. **RESULTS:** At rest pennation angle was 14.8 ± 2.2 o , muscle thickness was 2.69 ± 0.39 cm, and calculated fascicle length was 10.6 ± 1.3 cm (mean ± SD). With increasing force, angle increased (R 2 =0.987), muscle thickness decreased (R 2 =0.857), fascicle length decreased (R 2 =0.864), and excursion increased (R 2 =0.987). Excursion of the central tendon varied from 0.63 ± 0.95cm at 10% MVC to 2.25 ± 0.21 cm at 50% MVC. Excursion had the lowest coefficient of variation (on average 15%). **DISCUSSION:** To our knowledge, this study was the first to measure internal architecture responses to isometric contractions. Excursion of the central tendon had the largest effect size and best reproducibility. The coefficients of variation that we measured were higher than similar ultrasound measurements by other investigators. If the coefficient of variation can be reduced, these measurements may be useful for the study of muscle function in age and disease.

Back to Authors
Back to Titles

Christopher Stokes
Child Mental Health and Academic Achievement

Child mental health is correlated with academic achievement in elementary school, yet the reasons for this relationship are not known (Veldman & Worsham, 2001). Temperament theory suggests that two components of mental health, attentional control and impulsivity are the active ingredients that either promote or interfere with academic achievement. Attentional control is the ability to orient, sustain, and shift attention; attentional control allows children to regulate their internal arousal. Impulsivity refers to the ability to regulate behaviors related to internal arousal and is exemplified by hyperactive behaviors such as interrupting others and excessive talking (Posner & Rothbart, 2000). We investigated these constructs in a sample of 38 first through fifth grade children by forming two groups of children, moderate behavior problems versus few behavior problems, based on teacher ratings from the prior academic year. We then collected detailed classroom observations of attentional control and hyperactivity/impulsivity behaviors for these same children on several occasions during the 2002/2003 academic year. We found that the moderate behavior problem group displayed significantly more attentional control problems in the classroom, a finding that is consistent with predictions that this variable is important for academic achievement in the classroom. There children also had less favorable academic interactions with teachers. We found, however, that children with few behavior problems were actually more hyperactive in the classroom than the moderate behavior problem group. These findings support the proposition that attentional control, and not impulsivity, is more likely to be an active causal ingredient for academic problems for young children.

Back to Authors
Back to Titles

Dana Swanson
Gender in Improvisational Comedy
Dr. Allen Partridge, Department of Drama and Theater, University of Georgia

Since Viola Spolin compiled the essentials of games, storytelling, folk dance, and dramatics in her 1963 Improvisation for the Theater , both women and men have actively participated in the humorous art of theatrical improvisational comedy. However, as both a comedic improviser and an audience member myself, I was curious if male and female improvisers experience gender inequality in this unscripted art form that was founded by a woman. Socialization often encourages the feminine gender—the gender from which improvisational theater and comedy initiated—to embrace passivity and a reserved nature whereas it encourages the masculine gender to celebrate aggressiveness and a more intense willingness to take risks. Thus, our culture's socialization standards are more conducive to males taking a on-stage lead in this craft. Through academic research in improvisational theory, interviews with improvisers, participation in improvisation, and observation and data collection of improvised scenes and both player interactions and audience reactions, I have found that both sexes often possess performance styles reflecting their corresponding gender socialization. However, specific gender-inclusive improvisational training, exercises, and games make players conscious of this socialization, allowing for a more gender-friendly playing ground during both practice and performance.

Back to Authors
Back to Titles

Candace Thompson
Girls in the System

Historically speaking, females made up just a small part of the total of juvenile crimes. Although juvenile arrests are declining in general, female juvenile arrest rates remain fairly constant. Contrary to the overall declining juvenile crime rate, the adult female crime rate is on the rise. It is evident that these issues must be dealt with before these young women grow into delinquent adults. This project will present a brief historical analysis on female criminals, and also current statistics about females in the juvenile justice system, including how they go through the system of "cops, courts, and corrections." Exploring the inequality of treatment of young women in the justice system will expose a gender bias. The process from arrest to conviction is explained. The pros and cons of the current practices are evaluated and addressed. Suggestions for future changes and improvements in the system are made.

Back to Authors
Back to Titles

Tracey Troutman
Early Chick Nutrition: Development of Pre-starter diets
Dr. Amy B. Batal

Immediately after hatch the young broiler chick is forced to rapidly switch from nutrients of endogenous sources (mainly from yolk lipids) to nutrients of exogenous sources (diet). The gastrointestinal tract is also increasing in weight faster than the chick's body weight. Thus, optimal nutrition during the first 4 to 7 days posthatching is crucial to ensure that chicks get off to a good start and are able to great their genetic potential. One way to achieve optimum nutritional benefits during this early period is to develop a pre-starter diet that would be fed for the first 4 to 7 days posthatching. The first step to developing an effective pre-starter diet is to determine the optimal nutrient levels required during the first 4 to 7 days posthatching. By studying the requirements of specific nutrients such as lysine and the sulfur amino acids (methionine and cystine) we will be able to formulate diets that provide chicks with the necessary nutritional balance during this crucial period of development. In Experiment 1 five levels of lysine (0.75 to 1.15% of the diet) were fed for the first 5 days posthatching. Growth performance did not plateau or reach a maximum suggesting that the requirement is greater than or near 1.15% lysine. This study suggests that the lysine requirement of chicks during the first 7 week posthatching is much higher than is currently reported. Additionally, preliminary experiments show a significant increase in weight gain from 0-21 days in diets enriched with 15% plasma. To further test the requirements for lysine and the sulfur amino acids two additional experiments are currently being conducted with emphasis placed on requirements for the first 4 days of age.

Back to Authors
Back to Titles

Jonas Vanags
Immunomodulatory activity of saliva from the lone star tick, Amblyomma americanum

The lone star tick, *Amblyomma americanum,* is the disease vector for human monocytic ehrlichiosis. Previous investigations suggest that ticks down-regulate host hemostatic and immune system components with saliva to obtain an adequate blood meal. Inadvertently, however, the modulation of host responses may facilitate pathogen transmission. Through a series of *in vitro* assays using a mouse as a model for the human, we have found evidence supporting a similar function for *A. americanum* saliva. Proliferation assays revealed significant dose-dependent inhibition in mitogen stimulated T- and B-cells and in antigen (OVA)-stimulated T-cells from a transgenic host. Two trends of cytokine secretion, measured with the Bioplex system, were found in response to OVA peptide. Inflammatory and Th1 cytokines showed dose-dependent inhibition, while Th2 cytokines were stimulated at low levels of salivary gland extract and inhibited as doses increased. This evidence suggests that the host immune system is pushed toward a Th2 response. HPLC analysis and proliferation assays of HPLC fractions have shown evidence of inhibitory proteins. Work to further purify and characterize these proteins is planned. Identification and characterization of inhibitory proteins may lead to the understanding of the mechanisms of disease transmission and possible disease prevention.

Back to Authors
Back to Titles

Rachel Votta
Hahaha, : -), * Falling down laughing *: Expression of Amusement in a Computer-Mediated Community of Practice, an Ethnographic Approach

Members of a computer-mediated discourse community are faced with challenges when attempting to supplement conversational cues, especially emotional cues, not readily transmissible through the computer screen. Online speakers have developed methods for compensating that include ideographs of facial expressions, orthographic representations of non-speech sounds, and written notation that represents action. This paper takes an ethnographic approach toa small computer-mediated community that congregates on LiveJournal, an online weblogging program, and explores the community's choices for expressing amusement. The community members — all women — employ a variety of methods for expressing amusement, however they make stylistic choices for which method to use at which time. These stylistic choices, such as the tendency to use asterisk emoting (ex. *laughs*) or orthographic representation (ex. Hahaha) instead of emoticons, hold meaning and status within their community. The women's choices display the inherent variation in human language, both individually and as a community. These choices is emoting can tell researches much, not only about the specific community, but about language and communities of practice in general.

Back to Authors
Back to Titles

Wakefield, Ballew, and Klosson
An Examination of Gender and Age factors in relation to Preschoolers' Aggression

Aggressive behavior among children has fueled a great deal of today's academic research. With the prevalence of violence in schools, researchers are asking questions about the source and implications behind the increase of aggressive behaviors in youth. Studies have suggested that the development of aggressive behavior begins at an early age. Gender differences in aggression have also been identified, with males exhibiting more physical

aggression than females. In the present study, ninety-six preschoolers (54 boys) ranging from 38 months to 62 months (Mean age = 48.34 months, SD = 6.9 months) were recruited from a neighborhood day school and the same county's Head Start program. Two age groups (3-year olds and 4-year olds) were further divided based on their classroom compositions. Fifty-seven 3-year olds (31 boys, mean age 46 months and 26 girls, mean age 47 months) provided age and gender comparisons. This study is a part of a larger study by Chiang collected during the year 2000-2003. All children were randomly assigned into a triad group to participate in two structured plays where one standard toy was provided and a free play session. Children's behaviors were video recorded and coded by semi-blind researchers. Teachers and parents were asked to rate children's behaviors using Social Competence Behavioral Check Evaluation (SCBE: LaFreniere & Dumas, 1995). MANOVA results showed more differences in age factor than in gender factor. Four year olds were more apt to display aggressive behaviors through play and teachers' ratings. Implications will be discussed at the conference.

Back to Authors
Back to Titles

Daniel White

Survey Of public Health-Related Activities at the University of Georgia

The mission of public health as defined by the Institute of Medicine is to "fulfill society's interest in assuring conditions in which people can be healthy." Public health carries out its mission through organized, interdisciplinary efforts that address the physical, mental and environmental health concerns of communities and populations at risk for disease and injury. For this project a survey was carried out to identify public health related courses, research projects and public services and outreach projects at the University of Georgia. The online course description section of the UGA bulletin was read to identify public health related courses. The funded research projects section of The 2002 OVPR Annual Report was used to identify public health related research projects, and the various web sites of the offices of public service and outreach were used to find PS&O projects that were significant to this research. The public health related courses and projects identified through this research will be used to make a database outlining all public health activities ongoing at the University of Georgia. The information from this database will be used to create a framework to support the foundation of a School of Public Health at UGA. With nearly $19 million funding public health related research projects and over eighty public health related courses being offered on campus, the University of Georgia is well on its way to meeting the criteria necessary to open a school of public health.

Back to Authors
Back to Titles

Cale D Whitworth

AN INTEGRATED ANALYSIS OF A CHEMICAL REACTION NETWORK FOR THE METABOLISM OF QUINIC ACID IN *NEUROSPORA CRASSA*

Dr. Jonathan Arnold, Department of Genetics, University of Georgia, Athens, Georgia 30602

A chemical reaction network for the metabolism of Quinic Acid in *Neurospora crassa* has been proposed. In this reaction network two regulatory genes and five structural genes are responsible for the metabolism of Quinic Acid. The protein product of *qa* -1F transcriptionally controls the expression of all seven *qa* genes, including those encoding enzymes which utilize Quinic Acid as a carbon source, and the protein product, QA-1S, represses the activator protein, QA-1F. An ensemble of possible chemical reaction networks is developed with rate constants consistent with RNA and protein profiling data. An alternative network, in which several molecules of QA-1F (i.e. Hill coefficient is greater than one) cooperatively activate *qa* genes, is also developed.

Back to Authors
Back to Titles

Lauran E. Whitworth
Elliott Daingerfield's *Tanagra* and the Cultural Tension of Fin de Siècle America
Dr. Janice Simon, Department of Art History, Lamar Dodd School of Art, University of Georgia

The American fin de siècle (1876-1913) was an age of decadence, enlightenment, progress, and cultural revolutions; yet, it was also an era of polarities and contradictions with factions of modern culture simultaneously neglecting and appropriating antiquity. Henry James wrote (1888), "we are divided of course between liking to feel the past strange and liking to feel it familiar; the difficulty is, for intensity, to catch it at the moment when the scales of balance hang with the right evenness." Elliott Daingerfield's Tanagra (also called Contemplation, 1901, o/c) demonstrates this amalgam of what James deems "evenness" between the past and the present. In his use of the Tanagra figurine, Daingerfield (1859-1932) not only merges modern culture with classical influences but also combines stylistic elements of Orientalism and Symbolism, as well as introducing thematic notions of introspection, memory, and spirituality. Daingerfield's Tanagra stands out as a painting of pathos, reflecting not only the demeanor of the female subject, but also the atmosphere of turn-of-the-century America. I contend that Daingerfield's Tanagra embodies a culture in crisis, an America struggling to define itself amidst the many facets and fragments of foreign influences and modern trends. Thus, in its synthesis of classical and eastern aesthetics, it attempts to assuage a distinctly American anxiety. As I will demonstrate, Daingerfield's Tanagra, in fact, represents one of the best efforts at national identification and cultural clarity by one of America's most overlooked painters.

Back to Authors
Back to Titles

Meghan Wilson
Phylogenetic and Functional Analysis of Pax6 Regulatory Elements
Dr. Jim Lauderdale, Department of Cellular Biology, University of Georgia

The Pax6 transcription factor is required for several aspects of brain development, including regionalization of the neural tube and specification of several types of neurons. Mutations in *Pax6* cause a loss of forebrain structures and misspecification of neurons. However, little is known about the regulation of Pax6 and its mechanism of function in the developing brain. To study the function of Pax6 in the developing forebrain, I have taken a comparative approach using mammals and zebrafish. In zebrafish, the control elements have been divided among two similar transcription units. We have shown, in zebrafish, that one *Pax6* gene gives expression in the neuroepithelium throughout the telencephalon while the other *Pax6* gene gives expression in specific neurons. I hypothesized that I can separate these two control elements in the single mammalian *Pax6* gene. We have shown in transgenic mice that the region upstream of the human P 1 promoter contains the control elements responsible for expression in the forebrain, metencephalon, and spinal cord. I analyzed the expression domain of the control elements in this region upstream of the P 1 promoter by microinjecting the promoter region construct into zebrafish embryos, making them transiently transgenic. After 24 hours of development, I analyzed the reporter expression by creating an accumulated expression map and have shown that the region does give expression in both the neuroepithelium and in specific neurons. Finally, I performed a deletion analysis of the fragment to identify the discrete regions responsible for expression in either the neuroepithelium or the developing neurons.

Back to Authors
Back to Titles

Ryan Wilson
The Italian hill town as a model for United States urban redevelopment

The irregular layout of Italian public space is a poignant example of the adaptability to modern occurrences that is possible with minimal public governance and an increased public respect for the prospect of symbiosis

between human transportation modes within confined urban spaces. The United States and its inhabitants, on the other hand, now face an epidemic of poorly designed and maintained urban spaces that do not reflect the fluidity present in historically pedestrian Italian cities, which prohibits a symbiotic interaction between all street-level modes of human transportation. The observations gathered while monitoring this fluid daily life of the Italian piazza suggests that the wax and wane of pedestrian and mechanized traffic is a result of not only a delineated structure of allowable uses, but also an inherent realization of the importance by the populace that both forms of traffic play a necessary role in the functioning of the modern economy and society. In addition, the extraneous open space in Italian piazzas may be appropriated by a palpitating public forum of cafes and special events that serve as economic incentives to maintaining the multi-functionality of the piazza. The United States can greatly benefit by utilizing the design adaptability of Italian public space that has originated over thousands of years of intuitive and functional building layout, to redevelop a rich and concise fabric of urban public space.

Back to Authors
Back to Titles

Thomas Wood
The Role of CaaX Proteolysis in CaaX Protein Function
Dr. Walter K. Schmidt

Post-translational modification can be a very important step to the function of proteins. Certain proteins with a C-terminal amino acid sequence of cysteine (C), any two aliphatic amino acids (AA), and any amino acid (X) undergo a post-translational modification, referred to as CAAX processing. The human protein Ras undergoes CAAX processing. Understanding the CAAX modification pathway may therefore be useful for identifying methods that can regulate Ras hyperactivity that is typically associated with cellular transformation. Two proteases have been identified that are integral to CAAX processing in *Saccharomyces cerevisiae* . However, the specific characteristics of these CAAX proteases, Ste24p and Rce1p, are largely unknown. This study is focused on evaluating the physiological importance of CAAX proteolysis. We are testing the hypothesis that CAAX protein stability is altered in the absence of proper CAAX processing. We have found that the steady state levels of Ydj1p and Pex19p are reduced in yeast backgrounds lacking Ste24p. A prediction of our model is the alteration of the Ydj1p CAAX motif to an Rce1p-specific motif would correspondingly result in decreased levels in the Rce1p-deficient background. When such a Ydj1p mutant is evaluated, we find that levels are not reduced. Moreover, levels of Ras2p and **a** -factor are also not reduced in any protease-deficient background, suggesting that our hypothesis may only be valid for some CAAX proteins. Combined, our data suggests that CAAX proteolysis is essential for proper protein expression of Ydj1p and Pex19p, but that the protein levels of other CAAX proteins are not affected by CAAX proteolysis. This study implies that inhibitors of Rce1p and Ste24p may not affect the function of all CAAX proteins.

Back to Authors
Back to Titles

Kristine Yu
Studies on transgenic mice expressing a constitutively active luteinizing hormone receptor
Dr. Prema Narayan, Department of Biochemistry and molecular Giology, University of Georgia

The luteinizing hormone receptor (LHR) is a G protein-coupled receptor whose activity is regulated by luteinizing hormone and human chorionic gonadotropin. This receptor is essential in mammalian reproduction. A number of naturally occurring activating mutations in LHR cause precocious puberty, a disorder characterized by prepubertal increases in testosterone synthesis. To study the effects of chronic LHR activation *in vivo* , transgenic mice expressing a genetically engineered constitutively active yoked hormone receptor (YHR) were previously generated. YHR was constructed by covalently attaching a single chain hetrodimeric hCG to rat

LHR. Previous characterization of the YHR transgenic mice showed developmental alterations in the gonads. Testis sizes were reduced and an apparent decrease in the area of the seminiferous tubules was observed in testicular sections. Degenerative changes including the presence of cysts were observed in the ovaries. The main goals of my present project are 1) to perform a quantitative analysis of seminiferous tubule area to confirm the observed reduction in the testis sections of YHR transgenic mice. A digital image analysis of testicular sections using the NIH Image J software showed that the cross-sectional area of the tubules was significantly reduced in YHR transgenic mice consistent with the decrease in testicular size. 2) to determine the effect of the mouse genetic background on the ovarian phenotype and pathology. For this study, YHR mice will be bred into a CF1 genetic background and a histological analysis of their ovaries will be performed.

Back to Authors
Back to Titles