



# CURO

Center for Undergraduate Research Opportunities

## *Symposium* *2007*

Artwork by Hsuan Ju Susan Fang, CURO Summer Research Fellow



*April 9, 2007*

**Tate Student Center &  
Student Learning Center**

**Program and Book of Abstracts**

*Creating a Culture of Undergraduate Inquiry*

*The Honors Program's  
Center for Undergraduate Research Opportunities*



*CURO*

Center for Undergraduate Research Opportunities

**2007 Symposium  
Program and Abstracts**

CURO Office  
203 Moore College  
The University of Georgia  
Athens, GA 30602  
(706) 542-5871  
<http://www.uga.edu/honors/curo>

**Technology support compliments of:** College of Family & Consumer Sciences (Chasity McWilliams)

College of Veterinary Medicine (John Hess)

Franklin College of Arts & Sciences (Aaron Lines and Christine Miller)

Grady College of Journalism & Mass Communication (Cletus Stripling)

Terry College of Business (Sarah Fraker and Matt Payne)

**Symposium Chair:** Dr. Pamela Kleiber

**Edited and proofread by:** Rebecca Cheney, Sarah Craven, Jessica Hunt, Matthew Jordan, Dr. Pamela Kleiber, Rebecca Nordin, Semmy Purewal, Sarah Reiff

**Cover and poster design:** Rebecca Cheney

**Cover and poster art:** Hsuan Ju Susan Fang, CURO 2006 Summer Research Fellow, Drawing & Painting Major, Lamar Dodd School of Art, University of Georgia

**Published by:** Honors Program, University of Georgia

**Printed by:** Central Duplicating, University of Georgia  
©2007 CURO and the Honors Program

## ❧ *Table of Contents* ❧

---

<i>CURO 2008 Symposium Call for Abstracts.....</i>	<i>4</i>
<i>Symposium At-A-Glance.....</i>	<i>5</i>
<i>Program.....</i>	<i>7</i>
<i>Excellence in Undergraduate Research Mentoring Awards.....</i>	<i>26</i>
<i>Graduate Student Reviewers for CURO 2007 Symposium .....</i>	<i>28</i>
<i>Reviewers for Best Paper Awards.....</i>	<i>28</i>
<i>Reviewers for Excellence in Undergraduate Research Mentoring Awards.....</i>	<i>28</i>
<i>Reviewers for CURO Summer Research Fellowships.....</i>	<i>29</i>
<i>CURO Advisory Board.....</i>	<i>29</i>
<i>CURO Gateway Seminar Faculty.....</i>	<i>30</i>
<i>Karen A. Holbrook Academic Support Award Recipients.....</i>	<i>30</i>
<i>Research Abstracts.....</i>	<i>31</i>
<i>Index of Students and Faculty.....</i>	<i>112</i>



Center for Undergraduate Research Opportunities

# CURO

# Symposium 2008

University of Georgia  
Tate Student Center & Student Learning Center  
April 7, 2008

## CALL FOR ABSTRACTS

The Center for Undergraduate Research Opportunities at the University of Georgia provides a forum for all undergraduates to present original research and creative works sponsored by faculty members. Undergraduate students from all disciplines are encouraged to participate. Representatives of public and private higher education institutions in Georgia are encouraged to apply.

Presentations may be in the form of an oral presentation, poster session, exhibition, performance, or work of art. Students can also present a tutorial about a research methodology or new technology. Undergraduate researchers who are at various stages of the research process are encouraged to submit abstracts describing where they are in the research process and the issues they face. Those who wish to present their work should submit an application and an abstract of a maximum of 250 words (via the CURO web site) and a brief supporting letter from the sponsoring faculty member no later than January 18, 2008. Group research projects should be submitted with one application and one letter of faculty support. All abstracts will receive graduate student peer review with faculty guidance. All participants accepted into the Symposium will be notified by February 15, 2008, and their abstracts will be published in a book of abstracts. Sponsoring faculty will be invited to preside at their students' sessions.

### Best Paper Awards

Papers on work being presented at the CURO Symposium submitted by March 17, 2008 will be considered for Best Paper awards in the categories of humanities, social sciences, civic responsibility focus, international focus, and sciences. Papers must be submitted electronically to [curo@uga.edu](mailto:curo@uga.edu). Maximum length is 20 pages, double spaced.

### Purpose of the Symposium:

- To highlight excellence in research by undergraduate students
- To enrich the undergraduate experience by promoting communication and cooperation between faculty and students
- To provide a forum for undergraduates to communicate and disseminate their research findings and creative works
- To provide an opportunity for undergraduate researchers in the state of Georgia to engage with their peer researchers

### Criteria for Selection:

- Originality and quality of research
- Quality of written abstract
- Ethical and responsible research
- Extent of the undergraduate student's involvement in development of the research design and execution of the project. Research presented at the Symposium should go beyond work completed for a class paper or project
- A letter of support from supervising faculty

This event will be free and open to the public. All interested faculty and students are encouraged to attend the CURO 2008 Symposium. For more information, contact [curo@uga.edu](mailto:curo@uga.edu), (706) 542-5871.

# CURO 2007 Symposium At-A-Glance

---

## Monday, April 9, 2007

<b>Begin registration of oral and poster presenters; Students hang up posters</b> Tate Student Center, Lower Lobby	<b>8:30 a.m.</b>
<b>Concurrent Oral Sessions</b> Tate Student Center, Rooms 137, 138, 139, 140, 141, 142	<b>9:05 a.m.</b>
<b>Concurrent Oral Sessions</b> Tate Student Center, Rooms 137, 138, 139, 140, 141	<b>10:10 a.m.</b>
<b>Concurrent Oral Sessions</b> Tate Student Center, Rooms 137, 138, 139, 141, 142	<b>11:15 a.m.</b>
<b>Concurrent Oral Sessions</b> Tate Student Center, Rooms 137, 138, 139, 140, 141, 142	<b>12:20 p.m.</b>
<b>Concurrent Oral Sessions</b> Tate Student Center, Rooms 137, 138, 139, 141, 142	<b>1:25 p.m.</b>
<b>Creative Writing &amp; Dance</b> Tate Student Center, Georgia Hall A	<b>2:00 p.m.</b>
<b>Concurrent Oral Sessions</b> Tate Student Center, Rooms 137, 138, 139, 140, 141, 142, 143, 145	<b>2:30 p.m.</b>
<b>Welcome and Opening Session</b> Tate Student Center, Georgia Hall A	<b>4:00 p.m.</b> <b>Dr. David S. Williams</b> Director, Honors Program <b>Dr. David C. Lee</b> Vice President for Research <b>Dr. Arnett C. Mace, Jr.</b> Provost
<b>Introduction of Keynote Speaker</b>	<b>Douglas Jackson</b> CURO Summer Research Fellow and CURO Scholar
<b>Keynote Address: “The Researcher and the Wide, Wild World of the Internet”</b>	<b>Prof. Conrad Fink</b> Josiah Meigs Distinguished Teaching Professor Morris Chair of Newspaper Strategy & Management
<b>CURO Promising Scholars</b>	<b>Dr. David S. Williams</b> Director, Honors Program

## *CURO 2007 Symposium At-A-Glance*

---

**Announcement of Excellence in Undergraduate  
Research Mentoring Awards**

**Dr. Arnett C. Mace, Jr.**  
Provost

**Dr. Pamela Kleiber**  
Associate Director, Honors Program

**Poster Session, Reception, and Vendor Market**  
Tate Student Center, Georgia Hall A & B

**5:00 p.m.**

**CURO Apprentice & Promising Scholars Dinner**  
Tate Student Center, Reception Hall

**6:15 p.m.**

**Art Gallery Talks**  
Student Learning Center, Fourth Floor Rotunda

**6:15 p.m.**

**Prof. Georgia Strange**  
Director, Lamar Dodd School of Art

**Ms. Nora Wendl**  
Gallery Director, Lamar Dodd School of Art

**Dessert Reception & Announcement of  
CURO Summer Research Fellows, CURO Scholars,  
UGA Libraries Undergraduate Research Awards,  
and Best Paper Awards**  
Student Learning Center, Fourth Floor Rotunda

**8:00 p.m.**

**Dr. David S. Williams**  
Director, Honors Program

**Ms. Florence E. King**  
Assistant University Librarian for Human  
Resources and Director, Student Learning Center

**Ms. Deborah Dietzler**  
Executive Director, UGA Alumni Association

# ∞ CURO 2007 Symposium Program ∞

---

**Monday, April 9, 2007**

## **Concurrent Oral Sessions**

Tate Student Center, Conference Rooms 137, 138, 139, 140, 141, 142, 143, 145

### **9:05 – 9:55 a.m. First Concurrent Session**

<b>Room 137</b>	<b>Lauren Coffey</b>	The Repression of Dissent: Multi-Group Dissident Responses to State Repression in Burma, 1980-2005
	Faculty Mentor	Dr. Stephen Shellman, Department of International Affairs
	<b>Benjamin T. Cobb</b>	The Role of Non-resident Indians in Promoting U.S.-India Strategic Rapprochement
	Faculty Mentor	Dr. Seema Gahlaut, Center for International Trade & Security
	<b>Daniel Weitz</b>	The Legacy of AQ Khan: An Analysis of Illicit Trade Patterns in the Pre-enlargement European Union since the Exposure of the Khan Network and Recommendations for Preventing Future Catastrophe
	Faculty Mentor	Dr. Gary Bertsch, Department of International Affairs
<b>Room 138</b>	<b>Rebecca L. Satterfield</b>	Applying Koch's Postulates of <i>Mycobacterium shottsii</i> Infections in Fish
	Faculty Mentor	Dr. Frederick Quinn and Dr. Russell Karls, Department of Infectious Diseases
	<b>John R. Killey</b>	Diagnostic Assay for <i>Mycoplasma bovis</i> Using Immunohistochemistry
	Faculty Mentor	Dr. Corrie Brown, Department of Veterinary Pathology
<b>Room 139</b>	<b>Yannick Morgan</b>	African Immigrant Integration in Post-industrial Western Societies
	Faculty Mentor	Dr. Abdulahi Osman, Department of International Affairs
	<b>Breonne T. DeDecker</b>	The Rise of Political Islam in East Africa
	Faculty Mentor	Dr. Stephen Shellman, Department of International Affairs
	<b>Yael Miller</b>	Egyptian Life, As Represented in <i>Adrift on the Nile</i> and <i>Zaat</i>
	Faculty Mentor	Dr. Sherry Lowrance, Department of International Affairs
<b>Room 140</b>	<b>Mark J. Chilla</b>	Metrical Dissonance in Robert Schumann's Op. 39
	Faculty Mentor	Dr. John Turci-Escobar, Department of Music Theory & Composition

## ∞ CURO 2007 Symposium Program ∞

---

	<b>Sojourner Hodges</b>	Birdsong in the Minnesang Tradition: Natural Imitation and Symbolic Association
	Faculty Mentor	Dr. David Schiller, Department of Musicology & Ethnomusicology
<b>Room 141</b>	<b>Joshua J. Watkins</b>	The Price of Victory: Influences on the Conduct of War
	Faculty Mentor	Dr. Patricia Lynne Sullivan, Department of International Affairs
	<b>Joseph T. Lariscy</b>	Healthcare Coverage among Latinos in an Emerging-gateway Southern State
	Faculty Mentor	Dr. Leigh A. Willis, Department of Sociology
	<b>Lucas L. Puente</b>	American Investment in a Post-Castro Cuba
	Faculty Mentor	Dr. Stephen Shellman, Department of International Affairs
<b>Room 142</b>	<b>Adele Handy</b>	Metal-Metal Bonds and Aluminum Clusters
	Faculty Mentor	Dr. Gregory Robinson, Department of Chemistry
	<b>Grant M. Fiddymnt</b>	Mathematical Computing: Exploring the Relationship between the Critical Group and Structure of Graphs
	Faculty Mentor	Dr. Dino Lorenzini, Department of Mathematics
	<b>Sergey V. Fogelson</b>	A GP-evolved Formulation for the Relative Permittivity of Water and Steam
	Faculty Mentor	Dr. Walter Potter, Computer Science

### 10:10 – 11:00 a.m. Second Concurrent Session

<b>Room 137</b>	<b>Susan S. Guo</b>	Systematic Empirical Study: The Impact of Sri Lanka's Economy on Dissident Behavior
	Faculty Mentor	Dr. Stephen Shellman, Department of International Affairs
	<b>Andrew W. Pierce</b>	My Neighbor's Keeper: Social Capital as a Means of Mediating Extremist Activity
	Faculty Mentor	Dr. Tom McNulty, Department of Sociology
	<b>Karen C. Wong</b>	Political and Social Foundations for Environmental Sustainability
	Faculty Mentor	Dr. Andrew Whitford, Department of Public Administration & Policy
<b>Room 138</b>	<b>Blake M. Troiani</b>	Genetic Systems for the Elimination of Polyphosphate Synthesis in <i>Mycobacterium avium</i> Subspecies <i>paratuberculosis</i>
	Faculty Mentor	Dr. Russell Karls and Dr. Frederick Quinn, Department of Infectious Diseases

## ∞ CURO 2007 Symposium Program ∞

---

	<b>Jake E. Turrentine</b>	The Role of CD8+ T Cell Responses to Immunodominant Trans-sialidase Epitopes in Control of Experimental <i>Trypanosoma cruzi</i> Infection
	Faculty Mentor	Dr. Rick L. Tarleton, Department of Cellular Biology
	<b>Erica M. Hall</b>	Intracellular Gene Transfer from the Mitochondrion to the Nucleus in <i>Toxoplasma gondii</i>
	Faculty Mentor	Dr. Jessica C. Kissinger, Department of Genetics
<b>Room 139</b>	<b>Courtney M. Thomas</b>	Peyton Wall's Impact on Racial Relations in 1960s Atlanta, Georgia
	Faculty Mentor	Dr. Barbara McCaskill, Department of English
	<b>Karen C. Usselman</b>	Music and Identity among Mexican Immigrants in Atlanta, 1985-2006
	Faculty Mentor	Dr. Pamela Voekel, Department of History
	<b>Emily Powers</b>	Public Space in a New Urbanist Development: A Case Study of Atlantic Station
	Faculty Mentor	Dr. Steven Holloway and Dr. Katherine Hankins, Department of Geography
<b>Room 140</b>	<b>Helen C. Smith</b>	Determining Appropriate Social Assistance Models for Children Living in Communities Affected by HIV/AIDS in Sub-Saharan Africa
	Faculty Mentor	Dr. Christopher Allen, Department of International Affairs
	<b>Eva Bonney Reed</b>	Development and Evaluation of a Coping Skills Training Program for Adolescents with Inflammatory Bowel Disease (IBD)
	Faculty Mentor	Dr. Ronald Blount, Department of Psychology
<b>Room 141</b>	<b>Disha Chhabra</b>	Indigenous Use of Medicinal Plants and Herbs by the Pavacachi Community of the Ecuadorian Region of the Amazon Rainforest
	Faculty Mentor	Dr. James Affolter, Department of Horticulture
	<b>Jesse N. Oakley</b>	Curbing Private Forestland Divestment: Research into Georgia's Private Forests
	Faculty Mentor	Dr. Laurie Fowler, Institute of Ecology
	<b>Sara B. Johnson</b>	A Biotechnological Approach to Restoration of American Chestnut ( <i>Castanea dentata</i> ): Mass Propagation via Somatic Embryogenesis
	Faculty Mentor	Dr. Scott Merkle, Department of Forestry Research

## ∞ *CURO 2007 Symposium Program* ∞

---

### 11:15 a.m. – 12:05 p.m. Third Concurrent Session

<b>Room 137</b>	<b>Jae W. Jeon, Daniel Alvarez, Jarrad Barber</b> Faculty Mentor	Genetic and Environmental Effects on Aggressive Behavior in <i>Drosophila</i>  Dr. Wyatt Anderson, Department of Genetics
	<b>Jodi L. Dyer</b>  Faculty Mentor	The Effects of Antibiotic Use in Food Animals and the Prevalence of Tetracycline Resistance in Bovine Gastrointestinal Commensal Bacteria  Dr. Susan Sanchez, Athens Diagnostic Laboratory
	<b>Lisa Rivard</b>  Faculty Mentor	Determining the Affinity of Perchlorate for Albumin in Rat Serum Using Equilibrium Dialysis and Ion Chromatography  Dr. Jeffrey Fisher and Dr. Jerry Campbell, Department of Environmental Health Science
<b>Room 138</b>	<b>Natalie M. Picchetti</b> Faculty Mentor	Effects of Alcohol Use on Cognitive Ability Dr. Jennifer McDowell, Department of Psychology
	<b>Aaron K. McPherson</b>  Faculty Mentor	The Influence of Muscle Length on Muscle Oxygen Saturation  Dr. Kevin McCully, Department of Kinesiology
	<b>Anna M. Moise</b>  Faculty Mentor	Differential Modulation of Anxiety-like Behavior in Syrian Hamsters by Endocannabinoids and Benzodiazepines Andrea G. Hohmann, Department of Psychology
<b>Room 139</b>	<b>Kathryn L. Scheffel</b>  Faculty Mentor	Femininity as a Continuum: From Battered Victim, to Self-Defense Aggressor, to Lesbian and to Barbarian Dr. Dean Rojek, Department of Sociology
	<b>Erika B. Vinson</b>  Faculty Mentor	The Effectiveness of Teaching Expressive Arts Activities Based in the Methods of Art and Drama Therapy to Educators to Improve Student Welfare  Dr. Richard Siegesmund, Department of Art Education
	<b>Alexander W. Watts</b>  Faculty Mentor	Sexual Orientation as a Diffuse Status Characteristic: The Effects of Sexual Orientation on Expectations in Interaction Dr. Dawn Robinson, Department of Sociology
<b>Room 141</b>	<b>Jennifer S. Ivey</b>  Faculty Mentor	The Who, What, Where and Why of Georgia's 2006 Agriculture Commissioners Race: An In-depth Look at the Reasons for Tommy Irvin's Landslide Victory over Gary Black  Dr. Charles Bullock, Department of Political Science

## ❧ *CURO 2007 Symposium Program* ❧

---

	<b>Katie Orlemanski</b>	Gentrification in Athens, Georgia: A Two-sided Coin in a County with the Fifth Highest Poverty Rate in the Nation
	Faculty Mentor	Dr. Patricia Richards, Department of Sociology
	<b>Deep J. Shah</b>	Unsuspecting Targets – Preparing America’s College Towns for a Bioterrorism Attack
	Faculty Mentor	Dr. Loch Johnson, Department of International Affairs
<b>Room 142</b>	<b>John C. Binford</b>	A Genetic Exploration of Causal Factors Underlying Differential Recruitment Patterns in Chilean Barnacles
	Faculty Mentor	Dr. John Wares, Department of Genetics
	<b>Lindsey Thomas</b>	A Study of Site Formation Processes for the Northwestern Hawaiian Islands
	Faculty Mentor	Dr. Ervan Garrison, Department of Anthropology
	<b>Andrew M. Durso</b>	Environmental and Ontogenetic Changes in Detection Probability of Pond-breeding Salamanders in the Georgia Piedmont
	Faculty Mentor	Dr. John Maerz, Department of Forestry Research

### **12:20 – 1:10 p.m. Fourth Concurrent Session**

<b>Room 137</b>	<b>Noona Oh</b>	Gender Meaning Parity and the Gay Movement: A Cross-cultural Study of Developing Movements
	Faculty Mentor	Dr. Dawn Robinson, Department of Sociology
	<b>Michael W. Davis</b>	Sexuality in Israel: Birth of the Gay Rights Movement and Its Struggles for Acceptance in Israeli Society
	Faculty Mentor	Dr. Randy Sturman, Department of Religion
	<b>Maggie Mills</b>	An Empirical Study of Government and Dissident Interactions in Cambodia and Indonesia, 1980-2005
	Faculty Mentor	Dr. Stephen Shellman, Department of International Affairs
<b>Room 138</b>	<b>Crystal Rapier</b>	Effects of Mg/HA on Growth and Differentiation of Osteoblast Cells (Bone Cells) in a Hydroxy Apatite Scaffold
	Faculty Mentor	Dr. William Kisaalita, Department of Biological & Agricultural Engineering
	<b>Anant Mandawat, Bradley Allen</b>	Expression and Renaturation of Recombinant HL-1, a Lectin-like Protein that May Function as a Type II Diabetes Therapeutic
	Faculty Mentor	Dr. Michael Pierce, Department of Biochemistry & Molecular Biology

## ❧ *CURO 2007 Symposium Program* ❧

---

	<b>Ezinne A. Okwandu</b>	Characterizing PGMRC1, an Enzyme Suspected in the Regulation of the Cytochrome P450 CYP51A1
	Faculty Mentor	Dr. William Lanzilotta, Department of Biochemistry & Molecular Biology
<b>Room 139</b>	<b>Ashley A. Wilkinson</b>	Investigation of State-controlled Media Outlets and Their Reports on Internal Conflict: A Xinjiang Province Case Study
	Faculty Mentor	Dr. Stephen Shellman, Department of International Affairs
	<b>Danielle L. Pearl</b>	Media Development, Journalism and Democratization in Croatia
	Faculty Mentor	Dr. Keith Langston, Department of Germanic & Slavic Languages
	<b>Katherine B. Church</b>	National Geographic Magazine: What Gets Covered around the World?
	Faculty Mentor	Dr. Leara Rhodes, Department of Journalism
<b>Room 140</b>	<b>Hsuan Ju Susan Fang</b>	The Marriage of Expression and Design
	Faculty Mentor	Prof. Christopher Hocking, Departments of Studio Foundations, Drawing & Painting
	<b>Brian L. Harper</b>	Creation of a Computer Game from Concept to Completion
	Faculty Mentor	Dr. Mike Hussey, Department of Theatre & Film Studies
<b>Room 141</b>	<b>Tulsi Patel</b>	Developing a Biocontrol Agent for Chinese Privet, <i>Ligustrum sinense</i>
	Faculty Mentor	Dr. Scott Gold, Department of Plant Pathology
	<b>Brian T. Laughlin</b>	Functional Analysis of the <i>Magnaporthe grisea</i> Secretome
	Faculty Mentor	Dr. Alan Darvill, Departments of Biochemistry & Molecular Biology, Plant Pathology
	<b>Laura A. Thornsberry</b>	The Analysis of Synthetic Neoglycolipids by FTICR Tandem Mass Spectrometry
	Faculty Mentor	Dr. Jon Amster, Department of Chemistry
<b>Room 142</b>	<b>Jimari L. Jones, Jeremy Atkins</b>	Early Childhood Education and Family Literacy in Athens
	Faculty Mentor	Dr. Elizabeth DeBray-Pelot, Department of Lifelong Education, Administration & Policy
	<b>Crystal Barber, Kimberly Kite, Toni McCranie, LaToya Jones, Shanania Marshall</b>	The Influence of Parental Attitudes on Children's Gender Toy Preference
	Faculty Mentor	Dr. Tsu-Ming Chiang, Department of Psychology, Georgia College & State University

## ❧ *CURO 2007 Symposium Program* ❧

---

**Lionel (Leo) H. White** Mothers' Parenting Styles and Their Toddlers' Compliance  
Faculty Mentor Dr. Hui-Chin Hsu, Department of Child & Family  
Development

### 1:25 – 2:15 p.m. Fifth Concurrent Session

**Room 137** **William C. McWhorter,** The Path Less Taken: A Progressive Approach to Stem Cell  
**Naseem Esteghamat** Extraction and Grading  
Faculty Mentor Dr. J. David Puett, Department of Biochemistry & Molecular  
Biology

**Elizabeth A. Godbey** Differentiation of Human Embryonic Stem Cells to a  
Faculty Mentor Vascular Phenotype  
Dr. Steven Stice, Department of Animal & Dairy Science

**Kiya Birku** O-GlcNAc Modifications in Obese Mouse Models  
Faculty Mentor Dr. Lance Wells, Department of Biochemistry & Molecular  
Biology  
Dr. Ruth Harris, Department of Foods & Nutrition

**Room 138** **Nari Shin,** The Interaction between Culture, Poverty, and Educational  
**Celina Correa,** Achievement: How Policy Can Better Impact the Graduation  
**Yuliya Kuzovkova** Rates of Georgia's Latino and African American Youth  
Faculty Mentor Dr. Larry Nackerud, School of Social Work

**Robert B. Lindell** A Field Guide to English/Spanish Medical Translation  
Faculty Mentor Dr. David S. Williams, Honors Program

**Room 139** **Anh V. Trieu,** Trade for Humanity: A Proposal for Viet Nam  
**Ashley Bowen**  
Faculty Mentor Dr. Maurits Van der Veen, Department of International  
Affairs

**Aaron M. Sayama** North Korea: Options for Dealing with a Nuclear Armed  
Faculty Mentor State  
Dr. Stephen Shellman, Department of International Affairs

**Aqsa Mahmud** Under the Rug Swept: Rural Punjab Women in the Ecotone  
Faculty Mentor of Urbanization  
Dr. Fausto Sarmiento, Department of Geography

**Room 141** **Zach Fox** A Cellulosic Ethanol Plan for Athens  
Faculty Mentor Dr. Thomas Adams, Department of Biological &  
Agricultural Engineering

**Bryan P. Davis** Awareness of Student Expenditure Patterns  
Faculty Mentor Dr. Lance Palmer, College of Family & Consumer Sciences

## ∞ *CURO 2007 Symposium Program* ∞

---

	<b>William Patrick Dever</b>	The Economic Implications of a Marijuana Decriminalization Policy in the United States
	Faculty Mentor	Dr. William Lastrapes, Department of Economics
<b>Room 142</b>	<b>Sara Douglass, Kelli Webb, Matthew Anderson, Ankita Patel, Jeramy Denton</b>	The Stability of Children's Gender Toy Preference through a Two-year Longitudinal Study
	Faculty Mentor	Dr. Tsu-Ming Chiang, Department of Psychology, Georgia College & State University
	<b>Traci N. Tucker</b>	An Affect Control Model of Attribution
	Faculty Mentor	Dr. Dawn Robinson, Department of Sociology
	<b>Christopher MacLean</b>	The Effect of Cognitively Challenging Talk on Oral Language Development in Low-income Preschool Children
	Faculty Mentor	Dr. Paula Schwanenflugel, Department of Educational Psychology

### **2:00 – 3:20 p.m. Creative Writing & Dance**

Tate Student Center, Georgia Hall A

#### **Creative Writing & Dance Presenters**

<b>Alisan J. Atvur</b>	<i>Small Emergencies: Poems</i>
Faculty Mentor	Dr. Ed Pavlic, Department of English
<b>Brittney Inman</b>	<i>Living in Fire, Ice, and Cardboard; Hotter'N Hell; Green with a Cowboy Print; and Thanksgiving with the Pope, Popeye, and the Mafia</i>
Faculty Mentor	Prof. Judith Ortiz Cofer, Department of English
<b>Kacie Versaci</b>	<i>Chicken Water, What Are We?, and We Are Nothing But the Scraps</i>
Faculty Mentor	Prof. Judith Ortiz Cofer, Department of English
<b>Hariqbal Basi</b>	<i>Bollywood Fusion</i>
Faculty Mentor	Prof. Bala Sarasvati, Department of Dance Dr. Pamela Kleiber, Honors Program
<b>Cara O'Grady</b>	<i>Brief – Solo Study Utilizing Crafting Devices in Dance</i>
Faculty Mentor	Choreography Prof. Bala Sarasvati, Department of Dance
<b>Mia Holtzman</b>	<i>The Integration of Aesthetic Principles and Human Movement</i>
Faculty Mentor	Prof. Bala Sarasvati, Department of Dance

## ∞ CURO 2007 Symposium Program ∞

---

**Mary Mattmann**  
Faculty Mentor

*Gone but not – Making Dance through Improvisation*  
Prof. Rebecca Enghauser, Department of Dance

### 2:30 – 3:45 p.m. Sixth Concurrent Session

<b>Room 137</b>	<b>Mia Catherine Morgan</b> Faculty Mentor	Zeolites of Eastern Uganda and Their Scientific, Social, and Economic Potential Dr. William Kisaalita, Department of Biological & Agricultural Engineering
	<b>Samantha E. Keyes-Blumer</b> Faculty Mentor	The Role of Extremism in the Arab-Israeli Conflict Dr. Christopher Allen, Department of International Affairs
	<b>Yael Miller</b> Faculty Mentor	US Involvement in the Reconstruction of Lebanon Dr. Sherry Lowrance, Department of International Affairs
	<b>Andrew I. Gladden, Patrick Bentley</b> Faculty Mentor	Escalation or Acquiescence? An Analysis of Sequential Dissident Responses to Repression in Indonesia Dr. Stephen Shellman, Department of International Affairs
<b>Room 138</b>	<b>Katharine A. Owers</b> Faculty Mentor	The Effects of Heat Shock on the Lethality of Subsequent Infection in <i>Drosophila melanogaster</i> Dr. Daniel Promislow, Department of Genetics
	<b>Nithya M. Natrajan</b> Faculty Mentor	Effects of Glycerol on Processing of Kit Ligand Mutants in Mammalian Cells Dr. Mary Bedell, Department of Genetics
	<b>Jessica M. Bryant</b> Faculty Mentor	Katanin Plays a Role in Microtubule Dynamics and Ciliary Assembly in <i>Tetrahymena thermophila</i> Dr. Jacek Gaertig, Department of Cellular Biology
	<b>Leilah D. Zahedi</b> Faculty Mentor	The Effects of Colostral Leukocytes on TNF $\alpha$ Levels in Neonatal Calves Dr. David Hurley, Department of Large Animal Medicine
<b>Room 139</b>	<b>Rebecca Anne Creasy</b> Faculty Mentor	Formulation of a Stable Acidified Dairy Beverage Containing Ellagic Acid Dr. Louise Wicker, Department of Food Science & Technology
	<b>Amy J. Burrell</b> Faculty Mentor	Construction of and Use of GAUT1 and GAUT7 Reporter Gene Constructs to Study GAUT1 and GAUT7 Transcriptional Activity in Plants Dr. Debra Mohnen, Department of Biochemistry & Molecular Biology

## ∞ *CURO 2007 Symposium Program* ∞

---

	<b>Lamar H. Moree</b>	Gene Knockout Analysis of Two Putative Xylanase-regulating Transcription Factors in the Rice Blast Fungus
	Faculty Mentor	Dr. Alan Darvill, Departments of Biochemistry & Molecular Biology, Plant Pathology Dr. Sheng-Cheng Wu, Complex Carbohydrate Research Center
	<b>Mandy Redden</b>	Towards a More Effective Delivery System for Anti-cancer Drugs
	Faculty Mentor	Dr. Robert Arnold, Department of Pharmaceutical & Biomedical Sciences
<b>Room 140</b>	<b>Sana Hashmi</b>	Site-mapping and Glycan Characterization of Functional Alpha-Dystroglycan
	Faculty Mentor	Dr. Lance Wells, Department of Biochemistry & Molecular Biology
	<b>Yayne Fekadu</b>	The Interaction of Natural Killer Receptor + T-cells with <i>Campylobacter jejuni</i>
	Faculty Mentor	Dr. Joan O'Keefe, Department of Biochemistry, National University of Ireland, Galway
	<b>Ezinne A. Okwandu</b>	Tax Binding to Various CBP Domains
	Faculty Mentor	Dr. Jennifer Nyborg, Department of Biochemistry & Molecular Biology, Colorado State University
	<b>Richard C. Piercy</b>	Expression, Optimization and Crystallization of Cystathionine $\beta$ -Synthase and Cystathionine $\gamma$ -Lyase
	Faculty Mentor	Dr. Cory Momany, Department of Biomedical & Pharmaceutical Sciences
<b>Room 141</b>	<b>Seychelle M. Vos</b>	Initial Sequencing and Tissue Distribution of Toll-like 3 Receptor mRNA in White-tailed Deer
	Faculty Mentor	Dr. Elizabeth Howerth, Department of Veterinary Pathology
	<b>Aaron C. Petrey</b>	Polygalacturonase-inhibiting Proteins and Their Relationship to Polygalacturonases
	Faculty Mentor	Dr. Carl Bergmann, Complex Carbohydrate Research Center
	<b>Liron Bar-Peled</b>	Analysis of Why RNase P Is Essential for Cell Viability in <i>Escherichia coli</i>
	Faculty Mentor	Dr. Sidney Kushner, Department of Genetics
	<b>Zion Firew</b>	Characterization of Putative Genes that Encode the Enzymes Arabinose Kinase and Galactose Oxidase: Enzymes Involved in the Biosynthesis of Sugar Nucleotides
	Faculty Mentor	Dr. Maor Bar-Peled, Department of Plant Biology

## ∞ *CURO 2007 Symposium Program* ∞

---

<b>Room 142</b>	<b>Sonia Talathi</b>	Calcium-independent Phospholipase A <sub>2</sub> Are Novel Targets for Inhibition of Prostate Cancer Cell Growth
	Faculty Mentor	Dr. Brian S. Cummings, Department of Pharmaceutical & Biomedical Sciences
	<b>Paul A. Henkel</b>	RGS Proteins Regulate LPA Signaling in Ovarian Cancer Cells
	Faculty Mentor	Dr. Shelley Hooks, Department of Pharmaceutical & Biomedical Sciences
	<b>Rachelle W. Wallace</b>	Identification of L-PHA Reactive Glycoproteins from Invasive Breast Carcinoma Tissue: Potential Biomarkers for Early Detection
	Faculty Mentor	Dr. Michael Pierce, Department of Biochemistry & Molecular Biology
	<b>Madeline C. Elliott</b>	Calmodulin Activation of Estrogen Receptor $\alpha$ : Cloning and Expression of a Fusion Protein for Defining the Calmodulin Binding Determinants
	Faculty Mentor	Dr. Jeffrey L. Urbauer, Department of Biochemistry & Molecular Biology
<b>Room 143</b>	<b>Andrew C. McKown</b>	Determining Cost of Medical Sharps Disposal at a Local Health Center in Uganda
	Faculty Mentor	Dr. Robert T. Chen, Centers for Disease Control & Prevention
	<b>Christina L. Faust</b>	Influence of Bivalves on the Persistence of Avian Influenza Virus in Water
	Faculty Mentor	Dr. David Stallknecht, Department of Infectious Diseases
	<b>Melinda B. Murray</b>	Evaluation of Direct Plating Methods to Enumerate <i>Alicyclobacillus</i> in Beverages
	Faculty Mentor	Dr. Larry R. Beuchat, Department of Food Science & Technology
<b>Room 145</b>	<b>Brian Levy</b>	The English-only Movement: A Critical Analysis through Comparative Study of French Language Regulation
	Faculty Mentor	Dr. Larry Nackerud, School of Social Work
	<b>Elizabeth K. Hebbard</b>	A Universal Language? Translation and Cultural Imperialism in the Writings of Karl Vossler and Alphonse Daudet
	Faculty Mentor	Dr. Martin Kagel, Department of Germanic & Slavic Languages

# ∞ CURO 2007 Symposium Program ∞

---

**Melissa E. Whatley** The Effect of Age on Subject Doubling in French  
Faculty Mentor Dr. Diana Ranson, Department of Romance Languages

**Katie Griffith** Subject Expression in Nicaraguan Spanish: An Analysis of  
Linguistic and Pragmatic Factors  
Faculty Mentor Dr. Diana Ranson, Department of Romance Languages

## **4:00 p.m. Welcome and Opening Session**

Tate Student Center, Georgia Hall A

**Introductions and Welcome** Dr. David S. Williams, Director, Honors Program  
Dr. David C. Lee, Vice President for Research  
Dr. Arnett C. Mace, Jr., Provost

**Introduction of Prof. Fink** Douglas Jackson, CURO Summer Research Fellow and  
CURO Scholar

**Keynote Address** Prof. Conrad Fink  
*The Researcher and the Wide,  
Wild World of the Internet* Josiah Meigs Distinguished Teaching Professor  
Morris Chair of Newspaper Strategy & Management

**CURO Promising Scholars** Dr. David S. Williams, Director, Honors Program

**Excellence in Undergraduate  
Research Mentoring Awards** Dr. Arnett C. Mace, Jr., Provost  
Dr. Pamela Kleiber, Associate Director, Honors Program

## **5:00 p.m. Poster Presentations**

Tate Student Center, Georgia Hall A & B

**Laura M. Aikens** Self-concept Perception following Subliminal Exposure to Brand  
Personalities  
Faculty Mentor Dr. W. Keith Campbell, Department of Psychology

**Shivan P. Bhatt** Membrane Topology Studies of Rce1p  
Faculty Mentor Dr. Walter K. Schmidt, Department of Biochemistry & Molecular  
Biology

**Kiya Birku** O-GlcNAc Modifications in Obese Mouse Models  
Faculty Mentor Dr. Lance Wells, Department of Biochemistry & Molecular Biology  
Dr. Ruth Harris, Department of Foods & Nutrition

**Sarah R. Breevoort** Towards the Discovery of Ras-converting Enzyme Inhibitors: A  
Novel Oncogenic (Anti-cancer?) Target  
Faculty Mentor Dr. Walter K. Schmidt, Department of Biochemistry & Molecular  
Biology

## ∞ *CURO 2007 Symposium Program* ∞

---

<b>Ashley C. Burch</b> Faculty Mentor	Developing Synchronization Protocols in Ewes Dr. William Graves, Department of Animal & Dairy Science
<b>Charles P. Callihan</b> Faculty Mentor	Sexual Selection and the Relevance of Female Choice in <i>Drosophila</i> Dr. Wyatt Anderson, Department of Genetics Dr. Yong-Kyu Kim, Department of Genetics
<b>Colony C. Canady</b> Faculty Mentor	The Role of Hispanic Media in Athens-Clarke County Dr. Leara Rhodes, Department of Journalism
<b>Kevin K. Chang</b> Faculty Mentor	Immobilization of Xyloglucan-specific Endo- $\beta$ -1,4-Glucanase: Activity and Nectarin IV Inhibition Dr. William York, Department: Biochemistry & Molecular Biology
<b>Chuan Cheng</b> Faculty Mentor	Analyzing the Interactions of Acidic Matrix Polysaccharides with Cell Surface and Matrix Proteins Using Surface Plasmon Resonance Dr. Carl Bergmann, Complex Carbohydrate Research Center
<b>Jean Chi</b> Faculty Mentor	Strength in Numbers: Parasite Transmission and Virulence in Monarch Butterflies Dr. Sonia Altizer, Institute of Ecology
<b>Lauren Coffey</b> Faculty Mentor	The Repression of Dissent: Multi-Group Dissident Responses to State Repression in Burma, 1980-2005 Dr. Stephen Shellman, Department of International Affairs
<b>Caelin A. Cubeñas</b> Faculty Mentor	Studies of Hirano Bodies and Oxidative Stress in Neuroglioma Cells Dr. Marcus Fechheimer and Dr. Ruth Furukawa, Department of Cellular Biology
<b>Kimberly B. Cunningham</b> Faculty Mentor	Association between Infant Feeding and Body Composition Dr. Alex Anderson, Department of Food & Nutrition
<b>Dilhara T. De Silva</b> Faculty Mentor	Mechanisms of Bromide- and Bromate-induced Kidney and Liver Cell Death Dr. Brian S. Cummings, Department of Pharmaceutical & Biomedical Sciences
<b>Vanessa M. del Valle</b> Faculty Mentor	Analysis of the Self-serving Bias Using EEG Dr. W. Keith Campbell, Department of Psychology
<b>Andrew M. Durso</b> Faculty Mentor	Environmental and Ontogenetic Changes in Detection Probability of Pond-breeding Salamanders in the Georgia Piedmont Dr. John Maerz, Department of Forestry Research

## ∞ *CURO 2007 Symposium Program* ∞

---

<b>Madeline C. Elliott</b>	Calmodulin Activation of Estrogen Receptor $\alpha$ : Cloning and Expression of a Fusion Protein for Defining the Calmodulin Binding Determinants
Faculty Mentor	Dr. Jeffrey L. Urbauer, Department of Biochemistry & Molecular Biology
<b>Christina L. Faust</b>	Influence of Bivalves on the Persistence of Avian Influenza Virus in Water
Faculty Mentor	Dr. David Stallknecht, Department of Infectious Diseases
<b>Yayne Fekadu</b>	The Interaction of Natural Killer Receptor + T-cells with <i>Campylobacter jejuni</i>
Faculty Mentor	Dr. Joan O'Keeffe, Department of Biochemistry, National University of Ireland, Galway
<b>Grant M. Fiddymt</b>	Mathematical Computing: Exploring the Relationship between the Critical Group and Structure of Graphs
Faculty Mentor	Dr. Dino Lorenzini, Department of Mathematics
<b>Mary B. Gassama</b>	Investigation of the Genetic Population Structure of the Canine Hookworm, <i>Ancylostoma caninum</i>
Faculty Mentor	Dr. Ray Kaplan, Department of Infectious Diseases
<b>Gabrielle D. Gay</b>	Effects of 8-2 Fluorotelomer Alcohol on Gene Expression and Pregnancy Outcome in Mice
Faculty Mentor	Dr. Mary Alice Smith, Department of Environmental Health Science
<b>Courtney Grant</b>	An Investigation of Botulinum Neurotoxin Interactions on RhoA Activity Using <i>In Vitro</i> Assays
Faculty Mentor	Dr. Julie Coffield, Department of Physiology & Pharmacology
<b>Sana Hashmi</b>	Site-mapping and Glycan Characterization of Functional Alpha-Dystroglycan
Faculty Mentor	Dr. Lance Wells, Department of Biochemistry & Molecular Biology
<b>Paul A. Henkel</b>	RGS Proteins Regulate LPA Signaling in Ovarian Cancer Cells
Faculty Mentor	Dr. Shelley Hooks, Department of Pharmaceutical & Biomedical Sciences
<b>Annie Huang</b>	Epistatic Interactions among Long-lived <i>Drosophila melanogaster</i> Mutants
Faculty Mentor	Dr. Daniel Promislow, Department of Genetics
<b>Margaret A. Hubbard</b>	Magnitude of the Inverse Relationship between Nighttime Transpiration and Hydraulic Redistribution in <i>Quercus laevis</i>
Faculty Mentor	Dr. Lisa A. Donovan, Department of Plant Biology

## ∞ CURO 2007 Symposium Program ∞

---

<b>Justin L. Hula</b> Faculty Mentor	Taking <i>Clostridium thermocellum</i> ORFans from the ORFanage and Crystallizing Them in Search of Possible Novel Folds Dr. Claiborne Glover, Department of Biochemistry & Molecular Biology
<b>Jae W. Jeon, Daniel Alvarez, Jarrad Barber</b> Faculty Mentor	Genetic and Environmental Effects on Aggressive Behavior in <i>Drosophila</i>  Dr. Wyatt Anderson, Department of Genetics Dr. Yong-Kyu Kim, Department of Genetics
<b>Heather E. Johnson</b> Faculty Mentor	Screening of Fosmid Library of Environmental Genomic DNA from Sapelo Island Dr. James Hollibaugh, Department of Marine Sciences
<b>Joseph P. Johnson</b> Faculty Mentor	DNA Recognition by a Novel Recombinase Dr. Anna Karls, Department of Microbiology
<b>Sara B. Johnson</b> Faculty Mentor	A Biotechnological Approach to Restoration of American Chestnut ( <i>Castanea dentata</i> ): Mass Propagation via Somatic Embryogenesis Dr. Scott Merkle, Department of Forestry Research
<b>Kunal N. Kanani</b> Faculty Mentor	Sampling Ambient Air to Test for Polycyclic Aromatic Hydrocarbons Dr. Geoff Smith, Department of Chemistry
<b>John R. Killey</b> Faculty Mentor	Diagnostic Assay for <i>Mycoplasma bovis</i> Using Immunohistochemistry Dr. Corrie Brown, Department of Veterinary Pathology
<b>Aaron K. McPherson</b> Faculty Mentor	The Influence of Muscle Length on Muscle Oxygen Saturation Dr. Kevin McCully, Department of Kinesiology
<b>Natalie D. Kolleda</b> Faculty Mentor	Tracking Continent-wide Parasite Spread in Monarch Butterflies: Launching a New Citizen Science Project, MonarchHealth Dr. Sonia Altizer, Institute of Ecology
<b>Christopher H. Kragor</b> Faculty Mentor	Synthesis and Photochemistry of 8-Cyano-7-hydroxyquinoline (CHQ): A Photolabile Protecting Group with a High Photochemical Quantum Efficiency for Biological Use Dr. Timothy Dore, Department of Chemistry
<b>Aqsa Mahmud</b> Faculty Mentor	Under the Rug Swept: Rural Punjab Women in the Ecotone of Urbanization Dr. Fausto Sarmiento, Department of Geography
<b>Dakia McCray</b> Faculty Mentor	Models of Diversity Dr. Victoria Plaut, Department of Psychology

## ∞ CURO 2007 Symposium Program ∞

---

<b>John Nagao</b> Faculty Mentor	Annotation of Cuticular Protein Genes in <i>Anopheles gambiae</i> Dr. Judith Willis, Department of Cellular Biology
<b>Nithya M. Natrajan</b> Faculty Mentor	HESX1 Mutations in Idiopathic Hypogonadotropic Hypogonadism Dr. Lawrence Layman, Department of Obstetrics & Gynecology, Medical College of Georgia
<b>Victor M. Orellana</b> Faculty Mentor	Kinetics of Inhibition of Polygalacturonases and Polygalacturonase- inhibiting Proteins Dr. Carl Bergmann, Complex Carbohydrate Research Center
<b>Shreyal C. Patel</b> Faculty Mentor	Infectious Plant Pathogen: <i>Botrytis cinerea</i> Dr. Carl Bergmann, Complex Carbohydrate Research Center
<b>Tulsi Patel</b> Faculty Mentor	Developing a Biocontrol Agent for Chinese Privet, <i>Ligustrum</i> <i>sinense</i> Dr. Scott Gold, Department of Plant Pathology
<b>Daniel Perry</b> Faculty Mentor	Metropolis Monte Carlo Simulations of Thin Ferromagnetic/Antiferromagnetic Bilayers Dr. David Landau, Department of Physics & Astronomy
<b>Aaron C. Petrey</b> Faculty Mentor	Polygalacturonase-inhibiting Proteins and Their Relationship to Polygalacturonases Dr. Carl Bergmann, Complex Carbohydrate Research Center
<b>Natalie M. Picchetti</b> Faculty Mentor	Effects of Alcohol Use on Cognitive Ability Dr. Jennifer McDowell, Department of Psychology
<b>Crystal Rapier</b> Faculty Mentor	Effects of Mg/HA on Growth and Differentiation of Osteoblast Cells (Bone Cells) in a Hydroxy Apatite Scaffold Dr. William Kisaalita, Department of Biological & Agricultural Engineering
<b>Rachel M. Rarick</b> Faculty Mentor	Migration Reduces Parasite Prevalence in Monarch Butterflies Dr. Sonia Altizer, Institute of Ecology
<b>Clare H. Scott</b> Faculty Mentor	Identifying the Source of an Introduction of Yellowfin Shiner Dr. John Wares, Department of Genetics
<b>Neel N. Shah</b> Faculty Mentor	Construction of Plasmids for Deletion of the Polyphosphate Kinase Gene in <i>Mycobacterium tuberculosis</i> Dr. Russell Karls, Department of Infectious Diseases
<b>Christopher S. Sharp</b> Faculty Mentor	Development of Leptin Resistance through High-fructose Diet Dr. Ruth Harris, Department of Food & Nutrition

## ∞ CURO 2007 Symposium Program ∞

---

<b>Karin K. Sheehan</b> Faculty Mentor	Short-term Storage of MDBK Cells Dr. Jeremiah Saliki, Athens Diagnostic Laboratory
<b>Myra J. Stone</b> Faculty Mentor	The CO-H <sub>2</sub> Variation in Translucent Clouds at Small Scales Dr. Loris Magnani, Department of Physics & Astronomy
<b>Ryan J. Summers</b> Faculty Mentor	Characterization of the <i>vgat</i> Expression Pattern in the Developing Mouse Brain Dr. Brian Condie, Department of Genetics
<b>Sonia Talathi</b> Faculty Mentor	Calcium-independent Phospholipase A <sub>2</sub> Are Novel Targets for Inhibition of Prostate Cancer Cell Growth Dr. Brian S. Cummings, Department of Pharmaceutical & Biomedical Sciences
<b>Christine E. Tarleton</b> Faculty Mentor	Gene Expression Profiles of Neuronal Cells Derived from Human Embryonic Stem Cells Dr. Steven Stice, Department of Animal & Dairy Science
<b>Prince Tiekou</b> Faculty Mentor	Glycosyl Composition Analysis of <i>Rhizobium leguminosarum</i> 3841 Bacteroids Dr. Russell Carlson, Department of Biochemistry & Molecular Biology
<b>Jake E. Turrentine</b> Faculty Mentor	Parasite Strain-dependent Variation in CD8 <sup>+</sup> T Cell Responses Is a General Characteristic of Experimental <i>Trypanosoma cruzi</i> Infection Dr. Rick L. Tarleton, Department of Cellular Biology
<b>Anna Tyler</b> Faculty Mentor	The Effect of Women as Candidates in Congressional Campaigns Dr. Ruthann Lariscy, Department of Advertising & Public Relations
<b>Seychelle M. Vos</b> Faculty Mentor	Initial Sequencing and Tissue Distribution of Toll-like 3 Receptor mRNA in White-tailed Deer Dr. Elizabeth Howerth, Department of Veterinary Pathology
<b>Rachelle W. Wallace</b> Faculty Mentor	Identification of L-PHA Reactive Glycoproteins from Invasive Breast Carcinoma Tissue: Potential Biomarkers for Early Detection Dr. Michael Pierce, Department of Biochemistry & Molecular Biology
<b>Brooke L. Wheeler</b> Faculty Mentor	Investigation of the Horizontal Transfer of Virulence Factors of <i>Staphylococcus aureus</i> between Humans and Companion Animals Dr. Susan Sanchez, Athens Diagnostic Laboratory
<b>Jasmaine D. Williams</b> Faculty Mentor	The Broken Bridge: Discovering Why Alpha-Dystroglycan Loses Its Function Dr. Lance Wells, Department of Biochemistry & Molecular Biology

## ∞ CURO 2007 Symposium Program ∞

---

<b>Kathryn E. Williamson</b> Faculty Mentor	Titanium Carbide Nanocrystals: A Storage Medium for the Coming Hydrogen Economy? Dr. Steven P. Lewis, Department of Physics & Astronomy
<b>Shannon F. Yu</b> Faculty Mentor	Molecular Regulation of Parathyroid Organogenesis in the Mouse Dr. Nancy R. Manley, Department of Genetics
<b>Jessica Zaleon</b> Faculty Mentor	Lectin Histochemistry of Cell-surface Glycoproteins of the Non-pathogenic Ciliate <i>Tetrahymena thermophila</i> and the Pathogenic Ciliate <i>Ichthyophthirius multifiliis</i> Dr. Thomas Krunkosky, Department of Veterinary Anatomy & Radiology

### 6:15 p.m. Art Gallery Talks

Student Learning Center, Fourth Floor Rotunda

<b>Introductions</b>	Prof. Georgia Strange, Director, Lamar Dodd School of Art Ms. Nora Wendl, Gallery Director, Lamar Dodd School of Art
----------------------	---

#### Visual Arts Presenters

<b>Roman Alvarado Benitez</b> Faculty Mentor	<i>Calendar: Year of the Boar 2007</i> Prof. Susan Roberts, Department of Graphic Design
<b>Nikki Couppee</b> Faculty Mentor	<i>Flavor of Jude</i> Prof. Rob Jackson and Prof. Mary Hallam Pearse, Department of Jewelry & Metalwork
<b>Rachel Egger</b> Faculty Mentor	<i>Plasse</i> Prof. Susan Roberts, Department of Graphic Design
<b>Hsuan Ju Susan Fang</b> Faculty Mentor	<i>The Marriage of Expression and Design</i> Prof. Christopher Hocking, Departments of Studio Foundations and Drawing & Painting
<b>Comusina Celan Hardman</b> Faculty Mentor	<i>The Face of Costa Rica</i> Prof. Joseph Norman, Department of Drawing & Painting
<b>Carol M. Herbert</b> Faculty Mentor	<i>NERUDA</i> Prof. Susan Roberts, Department of Graphic Design
<b>Cassie L. Hester</b> Faculty Mentor	<i>Hand to Mind Coordination</i> Prof. Susan Roberts and Prof. Alex Murawski, Department of Graphic Design

## ∞ CURO 2007 Symposium Program ∞

---

**Matt Howell**  
Faculty Mentor

*It's lonely out here*  
Prof. Alex Murawski and Prof. Susan Roberts, Department of Graphic Design

**Kerry Jones**  
Faculty Mentor

*Intersections*  
Prof. Andrea Trombetta, Department of Fabric Design

**Chandler Leathers**  
Faculty Mentor

*Soldier Series Fall 2006*  
Prof. Michael Marshall and Prof. Stephen Scheer, Department of Photography

**Patricia Lynn Rhudy**  
Faculty Mentor

*Conversations with God*  
Prof. Ted Saupe and Prof. Sun Koo Yuh, Department of Ceramics

**Lindsey Thomas**  
Faculty Mentor

*The Caddo Bateau*  
Prof. R. G. Brown, Departments of Sculpture and Studio Foundations

**Laura Wood**  
Faculty Mentor

*Poppy Reliquaries and Tissue Ring*  
Prof. Rob Jackson and Prof. Mary Hallam Pearse, Department of Jewelry & Metalwork

**Art exhibit arranged by Ms. Nora Wendl**, Gallery Director, Lamar Dodd School of Art

### **8:00 p.m. Dessert Reception & Awards Ceremony**

Student Learning Center, Fourth Floor Rotunda

**Presentation of CURO Summer Research Fellows, CURO Scholars, UGA Libraries Undergraduate Research Awards, and Best Paper Awards**

Dr. David S. Williams, Director, Honors Program  
Ms. Florence E. King, Assistant University Librarian for Human Resources and Director, Student Learning Center  
Ms. Deborah Dietzler, Executive Director, UGA Alumni Association

## *∞ The Excellence in Undergraduate Research Mentoring Award ∞*

---

The office of the Senior Vice President for Academic Affairs and Provost and the Honors Program established the Excellence in Undergraduate Research Mentoring Award in 2001. This award recognizes faculty, departments, and programs devoted to outstanding research mentorship of undergraduate students. In 2006, the Graduate School and the Honors Program established a new award that recognizes graduate students devoted to the research mentorship of undergraduate students. Awards will be presented at the CURO Symposium Awards Ceremony on Monday, April 9, 2007 at 4:00 p.m. in the Tate Student Center, Georgia Hall A.

### **2007 Awards**

#### **Master Level Faculty Award**

Dr. Timothy Hoover, Associate Professor of Microbiology

#### **Early Career Faculty Award**

Dr. Steven Stice, Professor of Animal & Dairy Science

### **2006 Awards**

#### **Master Level Faculty Award**

Dr. Patricia Hunt-Hurst, Associate Professor of Textiles, Merchandising & Interiors

#### **Early Career Faculty Award**

Dr. Rodney Mauricio, Professor of Genetics

#### **Graduate Student Award**

Christopher Anderson, PhD candidate in Ecology

#### **Graduate Student Recognition**

Dawn Holligan, PhD student in Plant Biology

### **2005 Awards**

#### **Faculty Awards**

Dr. Gary Barrett, Odum Professor of Ecology

Dr. Sidney Kushner, Professor of Genetics

#### **Department Award**

Department of Cellular Biology

### **2004 Award**

#### **Faculty Award**

Dr. William S. Kisaalita, Associate Professor of Biological & Agricultural Engineering

## 2003 Awards

### **Faculty Award**

Dr. Jody Clay-Warner, Assistant Professor of Sociology

### **Department Award**

Department of Microbiology

Dr. Duncan Krause, Department Head

Dr. Timothy Hoover, Undergraduate Coordinator

### **Program Award**

The Pratt Laboratory of Plant Genomics and Bioinformatics

Dr. Lee H. Pratt, Professor

Dr. Marie-Michèle Cordonnier-Pratt, Senior Research Scientist

## 2002 Awards

### **Faculty Awards**

Professor William D. Paul, Jr., Professor of Art

Dr. Katherine Kipp, Associate Professor of Psychology

### **Faculty Recognition**

Dr. Susan Sanchez, Assistant Professor of Veterinary Medicine

### **Department Award**

Department of Biochemistry & Molecular Biology

Dr. J. David Puett, Department Head

### **Program Award**

“Physics Beyond the Boundaries”: National Science Foundation, REU Program

Dr. Loris Magnani, Principal Investigator, Professor of Physics and Astronomy

Dr. Heinz-Bernd Schuttler, Professor and Department Head of Physics and  
Astronomy

Dr. Jonathan Arnold, Professor of Genetics

Dr. Susmita Datta, Professor, Georgia State University

Dr. David Logan, Professor, Clark Atlanta University

Dr. William Steffans, Professor, Clark Atlanta University

## 2001 Awards

### **Faculty Award**

Dr. Marcus Fechheimer, Professor of Cellular Biology

### **Faculty Recognition**

Dr. David MacIntosh, Associate Professor of Environmental Health Sciences

Dr. Dean Rojek, Associate Professor of Sociology

### **Department Award**

Genetics Department

Dr. John MacDonald, Department Head and Professor

### **Program Award**

Savannah River Ecology Laboratory

Dr. Paul Bertsch, Director

## ❧ *Thanks and Acknowledgements* ❧

---

### *Graduate Student Reviewers for CURO 2007 Symposium*

Chris Bennett	Computer Science
Sarah Craven	Microbiology
John M. Davis	Ecology
Geneva DeMars	Biochemistry & Molecular Biology
Matt First	Marine Sciences
Ivy Holliman	History
Mary Johnson	Forestry & Natural Resources Management
Lisa Kanizay	Plant Biology
Maria Ruth Martinez Rodriguez	Anthropology
Anna McKee	Forestry & Natural Resources Management
Rebecca Nordin	Educational Psychology
Greta Polites	Management Information Systems
Semmy Purewal	Computer Science
Sarah Reiff	Cellular Biology
Jane Shevtsov	Ecology
Chip Small	Ecology
Sara Steger	English
James Tucker Swindell II	Biochemistry

### *Reviewers for Best Paper Awards*

Caroline Barratt	Reference Librarian, UGA Libraries
Dr. Brian Cummings	Assistant Professor, Pharmaceutical & Biomedical Sciences
Dr. Christy Desmet	Associate Professor, English
Dr. Jay Hakes	Director, Jimmy Carter Library & Museum
Diana Hartle	Reference Librarian, UGA Libraries
Dr. Margaret Holt	Professor Emerita, Adult Education
Dr. Sylvia Hutchinson	Professor Emerita, Language & Literacy Education and Institute of Higher Education
Greta Polites	Graduate Student, Management Information Systems
Deb Raftus	Reference Librarian, UGA Libraries
Dr. Dawn Robinson	Associate Professor, Sociology
Jill Severn	Reference Librarian, UGA Libraries
Dr. Fran Teague	Meigs Professor, English
Elizabeth White	Reference Librarian, UGA Libraries

### *Reviewers for Excellence in Undergraduate Research Mentoring Awards*

Dr. Sheila W. Allen	Dean and Professor, College of Veterinary Medicine
Dr. Marcus Fechheimer	Professor, Cellular Biology, Franklin College of Arts & Sciences
Dr. Kecia M. Thomas	Interim Director, Institute for African America Studies; Professor, Psychology, Franklin College of Arts & Sciences

## ❧ *Thanks and Acknowledgements* ❧

---

### *Reviewers for CURO Summer Research Fellowships*

Dr. E. M. (Woody) Beck	Professor, Sociology
Dr. Diane Bates Morrow	Associate Professor, History and African-American Studies
Dr. Fran Teague	Meigs Professor, English
Dr. Daniel Promislow	Professor, Genetics
Dr. Jean Martin-Williams	Professor, Brass
Dr. Rodney Mauricio	Associate Professor, Genetics
Dr. Loris Magnani	Professor, Physics & Astronomy
Dr. Regina A. Smith	Associate Vice President for Research

### *CURO Advisory Board*

Dr. Wyatt Anderson	Alumni Foundation Distinguished Professor, Genetics
Dr. E. M. Beck	Professor, Sociology
Dr. Gary Bertsch	Director and University Professor, Center for International Trade & Security
Dr. Margaret K. Cramer	Physician, University Health Center Women's Clinic
Dr. Art Dunning	Vice President for Public Service and Outreach
Dr. Maureen Grasso	Dean, Graduate School
Dr. David C. Lee	Vice President for Research and Associate Provost
Dr. Barbara McCaskill	General Sandy Beaver Teaching Professor, English
Prof. Jere Morehead	Vice President for Instruction
Dr. David Saltz	Department Head and Associate Professor, Theatre & Film Studies
Dr. Susan Sanchez	Associate Professor, Athens Diagnostic Laboratory, College of Veterinary Medicine
Dr. Fausto Sarmiento	Assistant Professor, Geography
Dr. Steven Stice	Senior Research Scientist and Associate Professor, Animal & Dairy Science
Dr. Katharina Wilson	Professor, Comparative Literature
Hariqbal Basi	Undergraduate Student
Caelin Cubeñas	Undergraduate Student
Douglas Jackson	Undergraduate Student

### *Ex Officio*

Dr. David S. Williams	Director of the Honors Program, Foundation Fellows, and CURO
Dr. Pamela B. Kleiber	Associate Director of the Honors Program and CURO

## ❧ *Thanks and Acknowledgements* ❧

---

### *CURO Gateway Seminar Faculty*

Prof. Mark Callahan	Ideas for Creative Expression (ICE)
Dr. Ron Carroll	Ecology
Dr. Kathleen DeMarras	Social Science Education
Dr. Joseph Dominick, Jr.	Journalism
Dr. William Eiland	Art History
Dr. Marcus Fechheimer	Cellular Biology
Dr. Maryann P. Feldman	Institute of Higher Education
Dr. Joe Fu	Mathematics
Dr. Katarzyna Jerzak	Comparative Literature
Dr. Pamela B. Kleiber	Honors Program and CURO
Dr. Elizabeth Kraft	English
Dr. Marc L. Lipson	International Business
Dr. Tricia Lootens	English
Dr. Larry Nackerud	Social Work
Dr. Jeffry Netter	Banking and Finance
Dr. Rosemary Phelps	Counseling Psychology and Human Services
Dr. David Porter	Botany
Dr. Dean Rojek	Sociology
Dr. Paul A. Schroeder	Geology
Dr. Scott Shamp	Telecommunications
Dr. Stephen Shellman	International Affairs
Dr. Sheila Slaughter	Institute of Higher Education
Dr. Michael Terns	Biochemistry and Molecular Biology
Dr. Kecia Thomas	Psychology
Dr. Scott L. Thomas	Institute of Higher Education
Dr. Katharina Wilson	Comparative Literature

### *Karen A. Holbrook Academic Support Award Recipients*

#### 2006 Award

Jody L. Dyer Faculty Mentor	Dr. Susan Sanchez, Athens Diagnostic Lab, College of Veterinary Medicine
--------------------------------	---

#### 2005 Award

Josef Broder Faculty Mentor	Dr. Andrew Sornborger, Department of Mathematics
--------------------------------	--

#### 2004 Award

Steven Jocoy Faculty Mentor	Dr. Michael Bender, Department of Genetics
--------------------------------	--

## ⌘ Abstracts ⌘

---

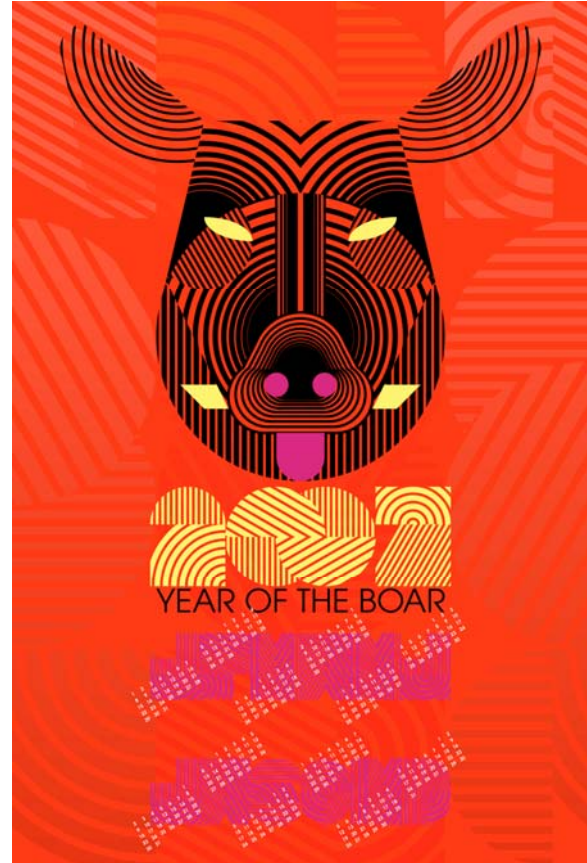
### **Self-concept Perception Following Subliminal Exposure to Brand Personalities**

Laura M. Aikens – CURO SCHOLAR  
Dr. W. Keith Campbell, Department of Psychology, University of Georgia

Marketing research has concluded that brand name products can be rated on five personality dimensions: sincerity, ruggedness, competence, excitement, and sophistication. An extension of this work has shown that following an interaction with products possessing certain brand personalities, individuals rated themselves higher on related dimensions. Furthermore, psychological research has shown that the self-concept can be influenced by unconscious sources. The goal of the present research was to examine the effect of implicit exposure to brand personalities on self-concept. We hypothesized that subliminal exposure to brands from one dimension will increase the cognitive accessibility of related personality characteristics. This research may aid in understanding the influence of commercialized media on personality. In Study 1, participants were primed with the names of either sincere brands (e.g. Hallmark) or rugged brands (e.g. NorthFace). To assess if this priming affected self-concept, participants were presented with adjectives and asked to decide if the word described them or not. In Study 2, participants were tested on various dispositional attributes including self-monitoring and materialism. The rest of the procedure was the same as Study 1 except brand logo primes replaced brand word primes. Results of Study 1 indicated that participants primed with sincere brand names more often described themselves as “sincere.” Results for Study 2 indicated that dispositional materialism affected self-description after priming. Overall, these results suggested that self-concept can be influenced by brand names, but further research is necessary to fully understand the relationship.

### **Calendar: Year of the Boar 2007**

Roman Alvarado Benitez  
Prof. Susan Roberts, Department of Graphic Design, University of Georgia



Graphic Design differs from Fine Art primarily in the immediacy of its communication. Although subtlety is a great asset and is often employed in my own designs, my goal is usually to communicate efficiently. This calendar was designed for self-promotional purposes and employs the simple idea that 2007 is a year of the boar in Chinese astrology. The more important aspects of this poster are the influences of modernist and pre-Hispanic American design. My goal was to create a composition that showcased the essential geometry of an image and entertained the viewer without excessive decoration. The primary image was first abstracted free-hand from a photograph. The resulting image was scanned and imported into Adobe Illustrator where it was further simplified. The striations were added last and

are meant to follow the planes of the original image.

Epson Ultrachrome Ink on coated paper  
12 in. x 18 in.  
2006

***Small Emergencies: Poems***

Alisan J. Atvur – CURO SCHOLAR  
Dr. Ed Pavlic, Department of English,  
University of Georgia

The original poems found in my creative thesis entitled "*The Bored Orderly: Poems*" are the result of two years of research in the field of modern American and Polish poetry. My research advisors are Dr. T.R. Hummer, nationally renowned poet and essayist, and Dr. Katarzyna Jerzak, associate professor of comparative literature at the University of Georgia. My thesis is a result of my fascination with the limpid, intelligent verse of Polish poets Wisława Szymborska and Zbigniew Herbert as well as American poets Carl Dennis and Tony Hoagland. The concern of my poetry is foremost the lucidity of well-crafted verse. Though my poems do not share a common theme or subject, many of the poems tackle the psychosis of the modern flâneur. The elegiac voice of many of the poems is a result of having lost several women in my life in the past six years. Works that most directly influenced the poems found in my thesis include Carl Dennis' *Practical Gods*, Wisława Szymborska's *Collected Poems*, Donald Hall's *Without*, Tony Hoagland's *What Narcissism Means to Me*, David Kirby's *Saving the Young Men of Vienna*, Rodney Jones' *Salvation Blues*, T.R. Hummer's *The Angelic Orders* and William Matthew's *Search Party*. As my interdisciplinary degree involves poetry, writing and education, the presentation of my thesis will consist of the reading of several of my poems punctuated with a discussion on my editing positions with the *Georgia Review* and the *Chattahoochee Review* and my research in introducing poetry to younger audiences.

**The Influence of Parental Attitudes on Children's Gender Toy Preference**

Crystal Barber, Kimberly Kite, Toni McCranie,  
LaToya Jones & Shanania Marshall  
Dr. Tsu-Ming Chiang, Department of  
Psychology, Georgia College & State University

Parental influence on toy preferences is evident for children as young as two years of age. The communication between the parents and their children during play is crucial to the development of the children's gender identities. Existing literature addresses how parents interact with their children according to each child's gender. However, parental gender attitudes and their influence on the development of children's preferences for gender-specific toys were not explored in previous studies. The benefit of examining parental attitudes is to aid our understanding of children's development of stereotypical or neutral gender behaviors. The current study surveyed parental attitudes towards gender, their observations of children's toys selections, and the toys they would purchase for their children. Children's toy preferences were assessed through interviews and real toy selection at school. Surveys were sent to parents of 62 children, between the ages of three and four. The preliminary data based on 35 returned surveys showed that parental gender attitudes were consistent with children's selection of gender specific toys. Mothers reported stronger gender stereotypical attitudes toward boys' choices of toys than fathers. Additional data analyses and results will be discussed at the conference. Further analysis is underway to determine the trend in larger data sets.

**Analysis of Why RNase P Is Essential for Cell Viability in *Escherichia coli***

Liron Bar-Peled – CURO SCHOLAR  
Dr. Sidney Kushner, Department of Genetics,  
University of Georgia

In *Escherichia coli* there are eight genes that encode tRNA<sup>Leu</sup>, including leuU, which has been suggested to be essential for cell viability. LeuU encodes tRNA<sup>Leu2</sup>, the tRNA that recognizes the leucine codons CUU and CUC.

In the *E. coli* chromosome, *leuU* is part of an operon, composed of itself and a protein-encoding gene, *secG*. Although the function of encoded *leuU* tRNA is well characterized, how it is processed into a mature tRNA is not well understood. However, two essential endoribonucleases, RNase E and RNase P, have been shown to be required for maturation of tRNAs. After verifying that the *leuU* gene was essential for cell viability, we hypothesized that if RNase P were required for generation of the mature of tRNA<sup>Leu2</sup>, we might be able to suppress the lethality associated with the loss of RNase P by providing tRNA<sup>Leu2</sup> exogenously. Accordingly I constructed a plasmid in which the *leuU* gene was transcribed from an inducible promoter and would not require RNase P for its maturation. This plasmid was found to complement a *leuU* deletion strain but not a temperature sensitive RNase P mutant. The results suggest that the enzyme's essential function is not confined to the production of a single tRNA species.

### ***Bollywood Fusion***

Hariqbal Basi

Prof. Bala Sarasvati, Department of Dance,  
University of Georgia

Dr. Pamela Kleiber, Honors Program, University  
of Georgia

Bollywood Fusion is a compilation of a variety of music and choreography, both traditional and modern, with Indian influence. The piece begins with traditional pieces of music, to which I perform a knife dance wearing more traditional attire. This music has more subtle beats, played with traditional and basic sounds accented by drums. Towards the middle of the performance, the music changes to a remix of modern, westernized music complementing the traditional Indian singing. This demonstrates not only the westernization of modern Indian music but also the impact of the East on western pop-culture, since this section of music was actually taken from a Hollywood soundtrack (*Moulin Rouge*). The latter part of the dance is indicative of what would be found in a modern Bollywood film. This demonstrates the westernization of

Bollywood and how Indian songs and choreography in modern films now incorporate modern, “electric” sounds and dance moves. The title of the piece reflects India’s film industry (Bollywood) and the “fusion” of western and eastern culture. The flow of the piece from traditional to modern demonstrates the progressive introduction of “fusion” elements in the music and dancing and the gradual blending of cultures, becoming increasingly apparent through the performance.

### **Membrane Topology Studies of Rce1p**

Shivan P. Bhatt – CURO APPRENTICE

Dr. Walter K. Schmidt, Department of  
Biochemistry & Molecular Biology, University  
of Georgia

A CaaX protein possesses the CaaX tetrapeptide structural motif: a C-terminal sequence comprised of the amino acid cysteine (C), two aliphatic amino acids (aa), followed by any amino acid (X). CaaX proteins fulfill important cellular processes such as signaling (Ras, Rac, RhoB), protein folding (Hsp chaperones), and fungal mating (*Saccharomyces cerevisiae* a-factor). This study focuses on Ras converting enzyme (Rce1p), an ER-localized membrane protease involved in the activation of the Ras signaling molecule. Ras is an important CaaX protein because hyperactive mutants of Ras are common in cancerous cells. Consequently, investigation of Rce1p membrane topology may assist in designing novel anti-cancer therapeutics. This study assessed fusions of a SUC2/His4C dual activity topology reporter attached to the C-terminus of 15 variously sized truncations of Rce1p. These Rce1p fusions were assessed for their glycosylation status after treatment with Endoglycosidase H and growth status on media containing histidinol. Reliable topology predictions for 10 fusions were included in the final assessment of Rce1p membrane topology. These topology predictions 1) provide empirical evidence for the existence of at least 7 Rce1p transmembrane spans and 2) highlight ambiguous regions of the protease as a focus for future topology studies.

### **A Genetic Exploration of Causal Factors Underlying Differential Recruitment Patterns in Chilean Barnacles**

John C. Binford – CURO SCHOLAR  
Dr. John Wares, Department of Genetics,  
University of Georgia

Recent studies have revealed a shift in the recruitment pattern of barnacles and mussels occurring at 32°-33° South latitude along the Chilean coastline. Populations north of this demarcation are characterized by decreased density and low recruitment rates compared to populations south of this proposed break. The objective of this project is to understand the dynamics of planktotrophic species, and, in turn, obtain a more holistic visualization of the marine communities along the South American coastline. The cause of these recruitment patterns is hypothesized to stem from the presence of selection factors or effects of physical oceanography. In order to distinguish between these two causes, we sequenced a 710 base pair fragment of the Mitochondrial Cytochrome Oxidase 1 gene in two species of barnacles, *Notochthamalus scabrosus* and *Jehlius cirratus*, in order to understand the nature of the gene flow present in these populations. Samples were obtained from six sites, including locations both north and south of the proposed ecological break. Statistical and phylogenetic analysis evidenced notably different patterns of genetic structure in each species. In *N. scabrosus*, genetic difference between northern and southern populations links recruitment rate and genotype, whereas *J. cirratus* is characterized by panmixia. The two species' different genetic structures reveal physical oceanography as an improbable primary cause of these recruitment patterns. Instead, it appears site-specific selection is partially driving the pattern in *N. scabrosus*. It is our hope that conservation efforts will be aided with this information, and nuclear genes are currently being analyzed to accompany this data.

### **O-GlcNAc Modifications in Obese Mouse Models**

Kiya Birku  
Dr. Lance Wells, Department of Biochemistry & Molecular Biology, University of Georgia  
Dr. Ruth Harris, Department of Food & Nutrition, University of Georgia

Non-insulin dependent diabetes (type II diabetes) has recently become the leading cause of new cases of blindness in the United States as a result of retinal cell decay due to glucose toxicity. Contrary to the influential role that type II diabetes plays in today's society, the genesis of this epidemic has yet to be determined. However, it has been suggested that type II diabetes is an adaptation to nutrient excess and low energy expenditure. O-linked  $\beta$ -N-acetylglucosamine (O-GlcNAc) is a post-translational modification of intracellular proteins and is a proposed glucose sensor that mediates signal transduction cascades based on the metabolic state of the cell. Studies have shown that elevated levels of the O-GlcNAc modification on intracellular proteins induces insulin resistance, the distinguishing characteristic of type II diabetes, measured by glucose uptake in response to acute insulin stimulation. Testing for the abundance of O-GlcNAc modified proteins and the cycling enzymes in different organs of *db/db* K/O mice that are obese, leptin-and insulin-resistant will help us understand the relationship between O-GlcNAc and the diabetic state of the whole animal. Global O-GlcNAc levels, as well as the abundance of the cycling enzymes, will be evaluated in K/O and wt mice organs using western blot analysis.

### **Towards the Discovery of Ras-converting Enzyme Inhibitors: A Novel Oncogenic (Anti-cancer?) Target**

Sarah R. Breevoort – CURO SUMMER RESEARCH FELLOW

Dr. Walter K. Schmidt, Department of Biochemistry & Molecular Biology, University of Georgia

The ultimate implication of this long-term project is the isolation of possible inhibitory compounds, which could potentially be developed as anti-cancer drugs. The proteases Rce1p and Ste24p promote a proteolytic step associated with the maturation of proteins containing a CaaX motif, where C is a cysteine, a is typically a small aliphatic amino acid, and X is one of several amino acids. Rce1p in particular is considered a chemotherapeutic target because of its crucial role in the maturation of Ras oncoproteins. Hyperactive forms of Ras are commonly associated with cancer, and thus inhibiting Ras maturation is proposed to disable, or at least moderate, its oncogenic activity. Because of the critical role Rce1p has in Ras processing, compounds that inhibit Rce1p would be lead candidates for a therapeutic drug. In this study, the inhibitory profiles of the Rce1p and Ste24p CaaX proteases using peptidyl(acyloxy)methyl ketones(AOMKs) and inhibitors identified by high throughput screening (HTS) are compared. It is concluded that AOMKs, although displaying better inhibitory properties than certain previously reported Rce1p inhibitors, are unlikely candidates for therapeutic drugs due in part to an inability to enhance potency. Nevertheless, several instances of selectivity for one CaaX protease over the other exist, which makes these compounds effective tools for investigating CaaX protease enzymology. The inhibitory profiles of compounds identified by HTS and their analogs are also evaluated and several appear to be potent Rce1p inhibitors. These compound analogs are farnesyl mimics, and are hypothesized to inhibit Rce1p activity by blocking the farnesyl binding pocket of the enzyme necessary for proteolysis of the substrate. These studies suggest that although

AOMKs are unlikely drug candidates, certain farnesyl mimics are potent CaaX protease inhibitors that could be potentially developed as anti-cancer drugs.

### **Katanin Plays a Role in Microtubule Dynamics and Ciliary Assembly in *Tetrahymena thermophila***

Jessica M. Bryant – CURO SCHOLAR  
Dr. Jacek Gaertig, Department of Cellular Biology, University of Georgia

The cytoskeleton is a dynamic structure that provides cell shape, motility, protection, organization, and division. Little is known about the *in vivo* regulation of the cytoskeleton, but it has been suggested that microtubule-severing proteins may play an important role in cytoskeleton dynamics. Katanin is an AAA ATPase microtubule-severing protein with a catalytic subunit, p60, and a non-catalytic subunit, p80. In order to study katanin's role in the ciliate *Tetrahymena thermophila*, a heterokaryon gene knockout was performed for each gene encoding a different subunit of katanin and the phenotypes were analyzed using immunofluorescence and electron microscopy. *Tetrahymena* has two genes that encode p60, KAT1 and KAT2, and one gene that encodes p80, KAT3. Cells lacking *Kat2p* appeared normal, while cells lacking either *Kat1p* or *Kat3p* showed multiple arrests in cytokinesis and had short, immotile cilia that lacked central pairs. This finding is supported by a previous experiment where flagella of *Chlamydomonas* lacking p80 lacked a central pair. *Kat1p* and *Kat3p* thus require each other for proper function of katanin. Cells lacking *Kat1p* or *Kat3p* also showed long, stable, acetylated microtubules in the cell body and long cortical microtubules, causing the mutants' arrest in cytokinesis, which suggests that *Kat1p* and *Kat3p* are required for microtubule-severing activity in the cell body of *Tetrahymena*. In addition, although assembly of basal bodies was normal in cells lacking *Kat1p* or *Kat3p*, assembly of cilia did not occur at every basal body, and cilia that were assembled were very short and lacked central pairs, rendering cells

immobile. This finding suggests that *Kat1p* and *Kat3p* also play a role in ciliogenesis. If further tests confirm a direct role of katanin in intraflagellar transport, this protein could be used to study ciliary diseases such as polycystic kidney disease.

### **Developing Synchronization Protocols in Ewes**

Ashley C. Burch  
Dr. William Graves, Department of Animal & Dairy Science, University of Georgia  
(Ashley C. Burch, Dr. Clay Lents, Dr. William Graves, Joseph Durham)

Synchronizing estrus can increase reproductive efficiency of livestock. Information regarding estrus synchronization of sheep in the southeastern United States is lacking. The objective of this study was to compare two synchronization protocols under natural service conditions. On day -6 ewes were randomly assigned to one of the two treatment groups (n = 18 per group). Ewes in (PGF) on day -6 and -1. Ewes in αgroup 1 received 10 mg of prostaglandin F2 g of gonadotropin-releasing hormone on day -6 and on day μgroup 2 received 100 0. Group 2 also received 10 mg of PGF on day -1. Plasma obtained from blood was collected on days -6, -1, 0 and 1. Plasma concentrations of progesterone were determined by radioimmunoassay (RIA). Treatment groups were replicated in two pastures using a single ram in each pasture. Each ram was raddled with paint crayons fitted to a harness, and estrus was determined by checking ewes daily for paint marks during the following 42 days of the breeding season. More ewes were in estrus earlier in group 1. Sixteen of the animals in group 1 became estrus during the first two weeks of the breeding season compared to 10 animals in group 2. Seven additional animals in group 2 became estrus in the third week of the breeding season. Lambing data is currently being collected. We conclude from these preliminary results that two injections of PGF 7 days apart are effective for estrus synchronization in sheep in the southeastern United States.

### **Construction of and Use of GAUT1 and GAUT7 Reporter Gene Constructs to Study GAUT1 and GAUT7 Transcriptional Activity in Plants**

Amy J. Burrell  
Dr. Debra Mohnen, Department of Biochemistry & Molecular Biology, University of Georgia

Pectin is a family of polysaccharides present in the cell wall of all plants. Pectin has many biochemical properties that contribute to plant growth and development. Homogalacturonan galacturonosyltransferases (GalATs) are enzymes that catalyze the transfer of galactosyluronic acid (GalA) residues from uridine diphosphate-GalA (UDP-GalA) to a growing pectic polysaccharide chain. One proven and one putative *Arabidopsis* GalAT, namely GALactUronosylTransferase1 and 7 (GAUT1 and GAUT7), were recently co-identified through a proteomic approach using partially-purified, detergent-solubilized *Arabidopsis* membrane protein preparations. The objective of this project is to analyze where within the plant the GAUT1 and GAUT7 genes are expressed, with the goal of understanding the biological function of these genes in pectin synthesis. This will be accomplished through utilization of a reporter gene system known as β-Glucuronidase (GUS), which will be driven by the promoter regions of the GAUT1 and GAUT7 genes. The promoter regions of GAUT1 and GAUT7 have been amplified from genomic DNA of *Arabidopsis thaliana* suspension culture cells and inserted into the cloning vector pGEM-T-Easy. The sequences of the promoter regions are currently being verified by DNA sequencing. Upon verification of the sequences, the promoter regions will be removed from pGEM-T-Easy and inserted upstream of the GUS gene in the vector pBI101. The pBI101 vector harboring the promoter:GUS constructs will be transformed into *Arabidopsis thaliana* plants for analysis of the tissue and cell-type specific expression of each GAUT gene. The results of these studies will be reported and discussed in relation to the functions of GAUT1 and GAUT7 in pectin synthesis in *Arabidopsis*.

### **Sexual Selection and the Relevance of Female Choice in *Drosophila***

Charles P. Callihan

Dr. Wyatt Anderson and Dr. Yong-Kyu Kim,  
Department of Genetics, University of Georgia

The mate selection process depends upon the responses of females to various male cues. In this experiment, isofemale lines, wild-caught lines that have been individually maintained in captivity, of *Drosophila* were used to test the null hypothesis that *Drosophila* females randomly mate among males with the goal of understanding the process of mate selection, and in turn, the evolution of *Drosophila*. To test the prediction that mate selection in *Drosophila* is not random, virgin females were added to a clear glass cage with 14 marked males and were observed daily for five consecutive days. After copulation, the male was identified, and the number of mating events per male was scored. Prior studies have shown that 10% of males mated multiple times while 20% never mated; and that cuticular hydrocarbons were involved in selective mating. The results suggest that there is variation in mating success among males, cuticular hydrocarbon characteristics could indicate vigor and status, and that *Drosophila* females mate non-randomly. Beneficial genes are passed on to the next generations and, as a result, gene frequency will be changed in populations.

### **The Role of Hispanic Media in Athens-Clarke County**

Colony C. Canady – CURO APPRENTICE

Dr. Leara Rhodes, Department of Journalism,  
University of Georgia

A growing Hispanic population in the Athens community raises the question of whether the Hispanic community is able to attain adequate community information in both their native Spanish language, as well as English. The Athens community's operation of only four Spanish-language sources, primarily radio stations, creates the need for a more diverse source of community information directed to this growing Hispanic community. This research

presents the results of an analytic study on the importance and need for community-based media for the Hispanic media consumer in Athens-Clarke County through the analysis of local Hispanic media and the proposed development of a Spanish-language television program. To investigate the necessity of Hispanic community media in the Athens community, literature reviews were conducted, in which connections were made with previous research on related topics. Individuals participating in the proposed development of the Spanish-language television program in Athens and various members of the Athens community, including Grady College professors and community leaders, were then interviewed. Ultimately, a Hispanic newsletter was developed and disseminated to Hispanic members of the Athens community. Results suggest that community-based organizations, such as television programs and Hispanic publications, play a critical role in advancing the socioeconomic status of Hispanics and affording them the opportunity to feel included in the community, which can in turn, promote community relations and most importantly create a public sphere for information this community needs in order to make informed decisions within the community. Due to the closing of one Hispanic media source in Athens-Clarke County, *Eco Latino Magazine*, and the failure of the proposed television program, my research included an applied project based on the completed research of how Hispanics use media and the importance of Hispanic media. A newsletter, representing one aspect of the Hispanic community, was developed and in turn, was distributed by Sister Margarita of Oasis Católico to the Hispanic community of Athens and served as much needed source of current issues while promoting community relations.

### **Immobilization of Xyloglucan-specific Endo- $\beta$ -1,4-Glucanase: Activity and Nectarin IV Inhibition**

Kevin K. Chang

Dr. William York, Department of Biochemistry & Molecular Biology, University of Georgia

Xyloglucan is a highly branched, hemicellulosic polysaccharide present in the primary cell walls of vascular plants. Xyloglucan cross-links cellulose microfibrils in these walls, forming a dynamic network that expands in a controlled, oriented fashion, thereby regulating cell growth. Some plant pathogens secrete an enzyme known as xyloglucan-specific endo- $\beta$ -1,4-glucanases (XEG) that specifically hydrolyzes xyloglucan chains. Xyloglucan-specific fungal endoglucanase inhibitor protein (XEGIP) is the only plant protein that has been shown to inhibit fungal endoglucanases and may play a key role in the plant's defense against fungal pathogens. Plant nectar contains an XEGIP ortholog called Nectarin IV (or NEC4), which binds to the fungal XEG, inhibiting its hydrolytic activity, thereby protecting the plant cell wall from enzymatic attack. The purpose of this study is to characterize immobilized XEG prepared by biotinylating the enzyme and binding it to magnetic beads. Catalytic activity of the immobilized XEG was demonstrated by the *p*-hydroxybenzoic acid hydrazide (PAHBAH) assay, which gives a colored product in the presence of reducing ends produced when the xyloglucan substrate is hydrolyzed. Reactions were also performed in the presence of NEC4 from tobacco nectar, showing that NEC4 binds to the immobilized XEG and inhibits it. The XEG-coated beads provide an experimental system for future experiments designed to bind, identify and isolate XEGIP orthologs and other plant proteins, including putative multiprotein aggregates, that are involved in the plant's resistance to microbial pathogens. Identification of such aggregates would provide invaluable insight into the mechanisms by which plant and animal cells defend themselves from pathogens.

### **Analyzing the Interactions of Acidic Matrix Polysaccharides with Cell Surface and Matrix Proteins Using Surface Plasmon Resonance**

Chuan Cheng

Dr. Carl Bergmann, Complex Carbohydrate Research Center, University of Georgia

Glycosaminoglycans (GAGs) are naturally occurring, heterogeneous, negatively charged, and N-acetylated, unbranched polysaccharides. GAGs in the extracellular matrix have been extensively studied and contribute to the general structure and permeability properties of connective tissues. Pectins are acidic polysaccharides that are primary structural elements of the matrix of the plant cell wall, serving functions similar to GAGs within their respective organisms. Surface plasmon resonance (SPR) biosensors measure the mass concentration of biomolecules close to the surface of a sensor chip that is coated with a macromolecule such as a protein or carbohydrate (the ligand). Samples containing an analyte are passed over the bound ligand and the level of interaction (translating into a biomolecular mass concentration change) is proportional to the level of refraction of laser light that shines onto the sensor surface. The laser refraction increases with the interaction between ligand and analyte and these changes are used to analyze the binding affinity and kinetics of the interaction. SPR is an ideal tool with which to measure the interactions of various cell surface and/or extracellular proteins with pectins and GAGs. Here we describe the development of an appropriate method for binding the pectin or GAG to the surface of the SPR chip to allow the study of this important class of interactions. Data from such studies will further our understanding of pectins' implications in morphogenesis, wall permeability, and plant defense, and GAGs' implications in binding of pathogens to particular target cells, maintenance of cellular activities, and development of metastasis in cancer cells.

**Indigenous Use of Medicinal Plants and Herbs by the Pavacachi Community of the Ecuadorian Region of the Amazon Rainforest**  
Disha Chhabra – CURO SCHOLAR

Dr. James Affolter, Department of Horticulture, University of Georgia

The Pavacachi community is an indigenous settlement on the shore of the River Curaray, in the heart of the Amazon rainforest of Ecuador. The community has a long history of subsisting on herbs and plant flora for primary health care. Ethnobotanical data were gathered over a four week period in which I lived within the community and interviewed two elders of the community, Alberto and Raul. The goals of this project included the scientific identification and classification of plants used by the community through visual identification of pictures taken in the forest. Also, I recorded the local names, uses, and modes of preparation of these medicinal plants. Finally, I performed a critical survey of medicinal plants in use in Ecuador today and analyzed how the Pavacachi pharmacopoeia fits within this larger context. Through this project, I documented data on more than thirty medicinally relevant plants that have been passed down the generations of the Pavacachi community and identified their place in the literature on the medicinal plants of Ecuador as a whole.

**Strength in Numbers: Parasite Transmission and Virulence in Monarch Butterflies**

Jean Chi

Dr. Sonia Altizer, Institute of Ecology, University of Georgia

The protozoan parasite, *Ophrocystis elektroscirrha*, infects monarch butterflies (*Danaus plexippus*). Parasite infection reduces fitness and longevity in monarch butterfly hosts, with higher parasite loads resulting in shorter host life spans. Because high infection levels (i.e. high parasite density) cause high virulence within the host, we tested if high infection loads are also advantageous to the parasite through increased transmission. Monarch larvae were infected with various doses of parasites and

reared to adulthood, and parasite spores on milkweed leaves and eggs were counted. Results showed that heavily infected monarchs transmitted more spores onto leaves and eggs than lightly infected monarchs. When females laid eggs, they also transmitted more spores onto leaves than when they did not lay eggs. Spore counts taken from two dates did not significantly differ, suggesting that once a host is infected, the parasite can be transmitted over a certain time interval without decreasing in number. These results suggest that parasites require a high level of infection to transmit most effectively, and that host health deterioration is an unavoidable cost to parasite survival. This study supports a long held theory in evolutionary biology that parasite virulence can evolve as a trade-off of parasites optimizing their fitness.

**Metrical Dissonance in Robert Schumann's Op. 39**

Mark J. Chilla

Dr. John Turci-Escobar, Department of Music Theory & Composition, University of Georgia

Robert Schumann's (1810-1856) *Eichendorff "Liederkreis,"* Opus 39, is a cycle of twelve songs rich in musical complexity particularly in regard to rhythm, but lacking in overall unifying themes. Music theorist Harald Krebs has written several scholarly articles and books concerning rhythmic complexities, which he has referred to as "metrical dissonance." With his analyses of Schumann's music, he often favors the metrical dissonances of his piano music to that of his vocal music. Through analysis of the songs highly syncopated areas using the techniques set forth by Krebs, the paper will highlight the metrical dissonances of Schumann's "Liederkreis" and show how the rhythmic complexities heighten the musical and extramusical expression. According to Krebs' theories, metrical dissonances occur either as displaced accents or as unequal grouping layered upon each other. In the "Liederkreis," the dissonances can occur without any kind of direct textual connection, as in the piano postludes for many of the songs. However, how these metrical dissonances coincide with the text is of

particular interest. A striking dissonance can occur at a crucial textual point, providing “word-painting.” Also, Schumann employs dissonances that occur over the course of an entire song, which helps to reflect the overall emotional effect. Highlighting the rhythmic complexities helps to clarify the music and text relationship while unifying the entire song cycle.

### **National Geographic Magazine: What Gets Covered Around the World?**

Katherine B. Church

Dr. Leara Rhodes, Department of Journalism, University of Georgia

Once thought to be merely marketing tools, recent research has shown that magazine covers may be cultural artifacts which record a society’s values and norms. To examine the role of magazine covers, a content analysis based on Sumner’s methodology was conducted on five representative European editions of the National Geographic Magazine over a four-month time period (n=24). The investigation compared the European editions to one another and to the English-language original. All of the covers were analyzed according to the type (human, animals, manmade objects, landscape, or nature) and theme (political nature, geographic scope, and scientific focus). It was hypothesized that the covers of the international editions, whose circulation relies predominantly on newsstand sales, would exhibit more of Sumner’s five marketing tools than the covers of the English edition, whose circulation is mainly subscription-based. It was surmised that the international editions must appeal to a broader consumer-base, demonstrating more marketing tactics, whereas, the English edition could target a more narrow subscription-base. Despite a greater dependency on newsstand sales, the investigation showed that the international covers retained a quality of cultural distinctiveness, as determined by a literature review of cross-cultural communication, and were distinct from the English original. The inconsistency in results across geography and time demonstrates that magazine covers do indeed act as cultural artifacts. Therefore,

magazine covers play a more influential social role than industry professionals believe. This study’s results show that magazine covers have the power to preserve individual cultures despite the globalization of the media industry.

### **The Role of Non-resident Indians in Promoting U.S.-India Strategic Rapprochement**

Benjamin T. Cobb

Dr. Seema Gahlaut, Center for International Trade & Security, University of Georgia

On December 8, 2006, the United States House of Representatives, in an overwhelming 330-59 vote, approved Senate amendments to House Resolution 5682, solidifying the Bush administration’s historic deal to legalize nuclear trade with India. This legislation represents the recent culmination of six years of rapprochement strategy pursued by the White House. Bilateral convergence has been driven by a range of issues including security/terrorism, defense relations, trade, and technology security. While the sustained political effort in recent years has attracted international media attention, little credit has been given to the Indian-American community, whose efforts have doubtlessly played a critical role in fostering U.S.-India bilateral cooperation. This study provides a critical analysis of the Indian-American community’s recent organized political efforts, unveiling successes and shortcomings in promoting U.S.-India strategic rapprochement. Special attention is granted to the U.S.-India Political Action Committee and the U.S.-India Business Alliance, which represent the interests of the nearly two million Indian-Americans to decision makers in both countries. To dissect this highly organized, complex lobby, the demographics of the Indian-American community are briefly discussed before outlining the historical rise of Diaspora politics. By highlighting the causes of political mobilization, the manifestations of political organization are better understood. This study also addresses a recent shift in Indian governmental policy, whereby the diasporic community has newfound leverage and support in promoting bilateral convergence.

**The Repression of Dissent: Multi-Group  
Dissident Responses to State Repression in  
Burma, 1980-2005**

Lauren Coffey – CURO SUMMER  
RESEARCH FELLOW

Dr. Stephen Shellman, Department of  
International Affairs, University of Georgia

My study seeks to explain dissident group responses to repressive governments. My study focuses on the repressive State Law and Order Restoration Committee (SLORC) or State Peace and Development Council (SPDC) regime of Burma/Myanmar and various dissident groups' responses to the regime. The SLORC regime took power in 1989 and is known for its harsh repressive policies. Numerous dissident groups including the All Burma Students Democratic Front (ABSDF), the Karen National Union (KNU) and Khun Sa's Mong Tai Army (MTA) exist in opposition to the regime. I seek to explain the behavioral relationships between the militant groups and the government by focusing on their day-to-day behavioral exchanges of conflict and cooperation. Primary data has been obtained from a search of English-language news reports through LexisNexis. The dataset generated from these news reports will be coded to generate multi-actor political event data. The project then employs several difference of means tests to determine how government repression affects the substitution of tactics by rebels over time. Specifically, the project compares the mean of each rebel group's behavior prior to repressive activities of the state and determines whether or not state repression succeeds at decreasing the mean hostile activities of each group. I expect to find that, once disaggregated, the multiple dissident groups will respond to the repressive activities of the state in a variety of ways. While some of the groups may meet state repression with increased levels of resistance, other dissident groups may offer their cooperation to the state. Traditional research on militant group responses to repressive regimes may be flawed and their statistical estimates biased since they aggregate all dissident groups' actions towards the state into a single variable. One of the aims of my

research is to determine whether the practice used in previous research projects of aggregating all groups together influences the inferences we draw from statistical studies.

***Flavor of Jude***

Nikki Couppee

Prof. Rob Jackson and Prof. Mary Hallam  
Pearse, Department of Jewelry & Metalwork,  
University of Georgia



This piece is based on my interest in the portrayal of Catholic Saints, Byzantine mosaics and contemporary cult figures. In *Flavor of Jude*, Saint Jude is transformed into Flavor Flav with the blending of Flav's unique characteristics onto the patron saint. Jude is depicted in a blue background typical of mosaics, but capped with Flav's signature Viking hat. Jude's pendant of Jesus is replaced

with Flav's clock which also emphasizes the different time frames the two come from. The brooch is framed in a Palladian window signifying the importance of the patron saint. This piece was made using Cloisonné enameling techniques and fabricated with metals such as silver and brass.

### **Formulation of a Stable Acidified Dairy Beverage Containing Ellagic Acid**

Rebecca Anne Creasy

Dr. Louise Wicker, Department of Food Science & Technology, University of Georgia

Acidified dairy drinks, such as Dannon® Frusion™, provide health-promoting nutrients and bacteria in a tasty, convenient product. The nutritional profile of these drinks can be further enhanced with addition of ellagic acid. Ellagic acid is a phytochemical that normalizes C-reactive protein levels linked to human inflammation. Ellagic acid is added to the dairy beverage in the form of muscadine skin. Within the beverage, skin particulates can interfere with interactions between pectin and casein micelles, decreasing beverage stability. Thus, the purpose of this research is to formulate and process a stable acidified dairy beverage containing ellagic acid. The treatment beverage will consist of yogurt made from milk, sugar, and non-fat dry milk powder fermented with a commercial *Lactobacillus bulgaricus* and *Streptococcus thermophilus* starter culture. A 0.6% pectin solution will be formulated from apple juice, sugar, and pectin. Dried muscadine skin and seed, yogurt, and pectin solution will be mixed (final pectin concentration of 0.3%) and homogenized at 5000psi. Homogenized beverage will be thermally processed at 190°F and pumped into sterile bottles. This process will be repeated for control yogurt beverage, omitting addition of muscadine skin. Stability of treatment and control yogurt drinks will be determined with a 90-day chilled storage study. During the 90-day study, particle size and sedimentation analysis, turbidity measurement, and BCA protein assay will be conducted as measurements of beverage quality. Results from the physical measurements for treatment and

control beverages will be analyzed to determine if stability can be increased with formulation modifications.

### **Studies of Hirano Bodies and Oxidative Stress in Neuroglioma Cells**

Caelin A. Cubeñas – CURO SCHOLAR

Dr. Marcus Fechheimer and Dr. Ruth Furukawa, Department of Cellular Biology, University of Georgia

Hirano bodies are paracrystalline F-actin aggregations associated with a variety of conditions including aging, Alzheimer's, Parkinson's, diabetes, and other diseases. The physiological function of Hirano bodies is unknown. An *in vitro* model for Hirano body formation was developed by expressing mutated forms of the 34 kDa actin-bundling protein (Maselli, et al., 2002, 2003). The altered forms of the protein are termed CT, the carboxyl-terminus (aa 124-295) which lacks an amino terminal inhibitory region, and  $\Delta$ EF1, which has mutations that affect intramolecular domain-domain interaction. Both forms exhibit activated actin bundling that causes formation of Hirano bodies. Because Hirano bodies are associated with aging and late onset diseases in which oxidative stress is implicated as a major factor, we investigated possible relations between oxidative stress and Hirano bodies. Experiments were conducted in WT (wild-type) H4 neuroglioma cells, and H4 cells transfected with either the enhanced green fluorescence protein (EGFP) or CT-EGFP. Application of oxidative stress results in formation of numerous Hirano bodies visualized by fluorescence microscopy. The viability of cells with and without Hirano bodies was assessed 24 hours after application of oxidative stress. All cells lines showed increased cell death with either increasing H<sub>2</sub>O<sub>2</sub> or menadione sodium bisulfite concentrations. The cells expressing CT-EGFP had a significantly greater level of death, indicating that Hirano bodies increased cell susceptibility to oxidative stress. Pretreatment of the cells with the anti-oxidant N,N-dimethyl-thiourea restored cell viability to control levels in all cell lines, indicating that the cell death was caused by

oxidative stress. Future experiments will investigate mechanistic details of these findings to better understand a possible relationship between Hirano bodies, oxidative stress, and late onset diseases.

### **Association between Infant Feeding and Body Composition**

Kimberly B. Cunningham

Dr. Alex Anderson, Department of Food & Nutrition, University of Georgia

Obesity and overweight are increasingly becoming public health problems here in the US and the rest of the world. Early and long-term preventive measures are urgently needed to fight this epidemic. The purpose of the study was to examine types of infant feeding and how they affect the mother's and the infant's body composition using the "BOD POD and PEA POD body composition systems," respectively. Pregnant women were recruited in the Athens area and followed through 12 weeks postpartum. Body composition of the mother was monitored at 36 weeks gestation, and through the first 12 weeks postpartum. The infant's body composition was monitored through 12 weeks postpartum. Subjects were interviewed for information on infant feeding practices, dietary practices and food habits, and other biomedical indicators. Results indicate that exclusively breastfeeding infants had higher percent body fat than mixed fed infants at 2 weeks postpartum. Exclusively breastfed infants were significantly longer than mixed fed infants ( $p < 0.05$ ). Although exclusively breastfed infants had significantly higher percent body fat earlier in life compared to mixed fed infants, this significant difference disappeared by 3 months postpartum. This result may suggest that exclusively breastfed infants obtain more fat from breastmilk, which is then used as a source of energy needed for the rapid growth during the first few months after delivery. Continued study of infants with respect to their feeding practices into adolescence will be necessary to fully understand any long-term effects of breastfeeding in the prevention of obesity and overweight in the United States.

### **Awareness of Student Expenditure Patterns**

Bryan P. Davis – CURO APPRENTICE

Dr. Lance Palmer, College of Family & Consumer Sciences, University of Georgia

This research focuses on student expenditure patterns at the University of Georgia. Literature on student debt and student consumption choices indicate that many college students regret consumption decisions made during college and would choose differently if they could do it over. However, many college students may not be sufficiently aware of potential spending problems, thus limiting their ability to change their spending behavior. This research model utilizes the Transtheoretical Model of Change, which provides a foundation for articulating and measuring how individuals make behavior change. This research will assess how aware students are of their consumption patterns. The sample is a 300-person elective course, which should cover many demographics, ages, and cultures of students. Since the sample size is so large, it should eliminate any size-related bias from our results. Students will complete an initial survey and questionnaire assessing their estimated spending behaviors as well as their readiness to change spending behavior. Students will keep track of their expenses regularly, using a secure website. Through this research, we hope to gain insight on how aware UGA students are of their spending behavior.

### **Sexuality in Israel: Birth of the Gay Rights Movement and its Struggles for Acceptance in Israeli Society**

Michael W. Davis – CURO SCHOLAR

Dr. Randy Sturman, Department of Religion, University of Georgia

In 1988, the Israeli Knesset voted to repeal Israel's sodomy law. Over the following two decades, gay rights advocates succeeded in expanding gay rights within the overtly Jewish state. These successes included the Knesset vote to outlaw workplace discrimination based upon sexual orientation in 1994 and the Israeli Supreme Court decision stating that a lesbian had the right to adopt her partner's child in

2005. Such successes positioned Israel as the most progressive Middle Eastern state on gay rights issues. Yet full marriage equality has not been achieved, and questions still linger over the place of homosexuals in a society dominated by Jewish tradition, mandatory military service, and the Arab-Israeli conflict. This paper analyzes the formation of the gay rights movement in the context of Israel's unique history as a Jewish democratic state. More specifically, this paper explores the discrepancy between the advances of the movement on the one hand and the actual lives of gays and lesbians within Israel on the other. Israeli films and memoirs are examined for evidence of the alternate acceptance and discrimination that homosexual individuals, both Israeli and Palestinian, experienced as the Israeli state officially expanded rights and protections for said individuals. Special attention is focused upon the issue of homosexuals within the Israeli military and gay relationships between Israelis and Palestinians.

#### **Mechanisms of Bromide- and Bromate-induced Kidney and Liver Cell Death**

Dilhara T. De Silva – CURO APPRENTICE  
Dr. Brian S. Cummings, Department of  
Pharmaceutical & Biomedical Sciences,  
University of Georgia

Bromide and bromate are by-products of the ozonation water purification system and are commonly found in drinking water. The mechanisms of bromide (Br<sup>-</sup>)- and bromate (BrO<sub>3</sub><sup>-</sup>)-induced death in Normal Rat Kidney (NRK) and liver cells (CRL1469) was investigated. Both BrO<sub>3</sub><sup>-</sup>, (added as KBrO<sub>3</sub>) and Br<sup>-</sup> (added as NaBr) induced concentration-dependent decreases in MTT staining after 48 hours in kidney and liver cells. BrO<sub>3</sub><sup>-</sup> reduced MTT staining at lower concentrations (0.1 to 1.6 mg/mL) than Br<sup>-</sup> (1.6 to 25.6 mg/mL). Cell morphology analysis demonstrated that 0.2 mg/mL BrO<sub>3</sub> altered kidney cell morphology, compared to 0.8 mg/mL in liver cells. The role of the sodium iodide symporter (NIS) in cell death was investigated by treatment with the NIS inhibitor NaClO<sub>4</sub> (20 mM) prior to BrO<sub>3</sub>- or Br<sup>-</sup> exposure. NaClO<sub>4</sub> increased MTT

staining in kidney but not liver cells. The effect of BrO<sub>3</sub><sup>-</sup> and NIS on annexin and PI staining and cell cycle were also determined. BrO<sub>3</sub><sup>-</sup> exposure increased both annexin V and PI staining in tandem, suggesting that cell death was primarily mediated by necrosis. Cell cycle analysis demonstrated that BrO<sub>3</sub><sup>-</sup> exposure doubled the percentage of cells in G<sub>2</sub>-M, which was not inhibited by NaClO<sub>4</sub>. These data demonstrate that BrO<sub>3</sub><sup>-</sup> and Br<sup>-</sup> cause concentration-dependent death in kidney and liver cells, that BrO<sub>3</sub><sup>-</sup> is a more potent toxicant than Br<sup>-</sup>, that kidney cells are more susceptible to BrO<sub>3</sub><sup>-</sup>-induced cell death than liver cells, and suggests that the mechanisms of BrO<sub>3</sub><sup>-</sup>-induced cell death involves both a G<sub>2</sub>-M arrest and NIS.

#### **The Rise of Political Islam in East Africa**

Breonne T. DeDecker

Dr. Stephen Shellman, Department of  
International Affairs, University of Georgia

The goal of this project is to explore the development of Political Islam throughout the Muslim populations of several East African states. The intent is to identify historical and cultural forces in each society that could inform the trend towards the politicization of Islam within the region over the past few decades. The central theme is the historical context in which the radicalization of Islam has taken place, and what common trends can be identified. Methodology was primarily comparative historical analysis, with emphasis on understanding the evolution of the political climate in each state from the colonial period until the present. This paper seeks to understand the common trends of ethnic divisions between Arab and African populations and the subsequent rise of Political Islam within three states: Kenya, Sudan, and Somalia. The states were chosen based on their geographic relationship, cultural relationship, susceptibility of penetration by modern terrorist organizations, and the interplay of ethnic groups within their borders. The focus is on evolutionary time periods within each state in regards to the politicization of Islam. These evolutionary periods include Islamic revolutions against

colonial domination, increased ethnic violence along religious lines due to competing territory claims, establishment of religious hierarchies within government access and education, and failed attempts at democratization.

### **Analysis of the Self-serving Bias Using EEG**

Vanessa N. del Valle – CURO APPRENTICE  
Dr. W. Keith Campbell, Department of Psychology, University of Georgia

The self-serving bias is the tendency of individuals to attribute negative outcomes to external factors and attribute positive outcomes to internal factors. Campbell and Sedikides (1999) described self-serving attributions as a preservation technique to heighten the image of the self in one's own eyes. The current study sought to replicate past research, predicting that participants would make self-serving attributions subsequent to false feedback in an adapted working memory task. Participants completed multiple questionnaires which measured various personality components that contribute to demonstration of the self-serving bias such as narcissism, depression, locus of control, and self esteem. Participants then completed a computer task which they were told was a memory task using working memory for face recognition. False feedback was administered to create equal numbers of failure and success conditions. Participants then attributed their "failure" or "success" to a forced choice between internal or external attributions. Internal and external attributions were further classified as stable or unstable. Using electroencephalography (EEG), brain activation was measured during the working memory task, during the 500 milliseconds before the attribution responses (biased or unbiased) were made. As hypothesized, individuals made significantly more self-serving responses following both positive and negative feedback. Preliminary analyses revealed more prefrontal cortex activity after participants received negative feedback preceding unbiased responses.

### **The Economic Implications of a Marijuana Decriminalization Policy in the United States**

William Patrick Dever – ROOSEVELT @ UGA  
Dr. William Lastrapes, Department of Economics, University of Georgia

Theory dictates that "successes" in US marijuana enforcement only lead to higher revenues for marijuana dealers, who are also responsible for funding other crimes. Furthermore, Miron reports that \$5.3 billion by state and local governments and \$2.4 billion federally are spent on marijuana enforcement (8, 10). Nevertheless in 2005, 16.9% of all Americans admitted to using marijuana within the last year (National Household Survey on Drug Use and Health). Thus this large sum has very little effect on the demand for marijuana and actually raises the cost to society. Therefore both in theory and in practice, the United States policy of marijuana prohibition is ineffective. A policy of decriminalization, under which the penalties for the production, sale and consumption of marijuana are lifted, should be implemented. Admittedly, a decriminalization policy can be reasonably expected to result in a relatively small increase in the amount of marijuana consumed, but would increase the total economic welfare as well as open up this whole market to safer governmental regulation and tax. To estimate the amount of revenue that could be received from a marijuana tax, the total yearly amount of consumption must be found and then treated like cigarettes for tax purposes. Even if no additional consumption occurred and marijuana is taxed at a rate comparable to cigarettes, the amount of government revenue to be gained would be approximately \$125 million federally and \$314 million for the states. This additional tax revenue should be used for both marijuana education and treatment to help to curb drug abuse and increase public awareness of possible health risks.

### **The Stability of Children's Gender Toy Preference through a Two-year Longitudinal Study**

Sara Douglass, Kelli Webb, Matthew Anderson, Ankita Patel & Jeramy Denton  
Dr. Tsu-Ming Chiang, Department of Psychology, Georgia College & State University

Children's use of gender cues is evident through socialization. At an early age, they begin to identify with a specific gender and build gender stereotypes. They further use these gender cues to guide their understanding of immediate contexts, and to build sex-typed behaviors accordingly. The socialization of gender is, in turn, often revealed by children's toy preferences. Understanding the stability of children's selections of gender-stereotyped toys would help educators and parents in understanding how children develop gender-specific behaviors. This project is aimed towards documenting the stability and changes of children's toy preferences over a two-year period. Forty-two children (girls = 30) were recruited from a county Head Start program, and were interviewed at age 3. Children were first asked to name one of their favorite toys verbally. A box containing masculine (e.g. a male firefighter as an action figure, a ball, a truck, a white stuff animal), feminine sex-typed toys (e.g. a baby doll, a Polly doll, a pink stuff animal) and neutral toys (e.g. a book, a star box which contained their favorite toy) were presented to children individually. Children were then asked to point to the toy they preferred. Two follow-up tests with the same procedure were used to document the preference changes. The preliminary results showed that boys developed gender-stereotyped behavior earlier than girls by frequently choosing toy truck and ball. In addition, the toy preference is very stable in boys earlier on, while girls do not become consistent until they turn four years of age.

### **Environmental and Ontogenetic Changes in Detection Probability of Pond-Breeding Salamanders in the Georgia Piedmont**

Andrew M. Durso – CURO APPRENTICE  
Dr. John Maerz, Department of Forestry Research, University of Georgia

Amphibian declines have prompted research into effective means to monitor amphibian populations. As estimates of species abundance are costly, presence-absence data are more frequently used for landscape-level monitoring efforts. Because aquatic salamanders are difficult to sample using opportunistic methods, the implications of using alternate sampling strategies to estimate patch occupancy must be rigorously assessed before these estimates can be considered valid. Estimates of detection probability are necessary for accurate interpretation of trends based on these data. Eight wetlands in Clarke County, Georgia were intensively sampled for pond-breeding salamanders using aquatic traps and opportunistic searches, to test effects of season, sympatry and pond permanence on detectability. Using program PRESENCE, detection probability was estimated for neotenic and adult forms of these species in fall, winter and spring. The amount of sampling effort required to infer absence with 95% confidence for each species was also estimated to obtain an index of survey quality. Inter- and intraspecific variation in detectability across wetlands were compared. Expected correlates between detection probability and wetland characteristics included a positive association between pond ephemerality and presence of neotenic forms, a negative interaction between adult *Notophthalmus* and *Ambystoma* larvae, and seasonal effects concurrent with known breeding intervals. These results emphasize that extensive effort must be employed to infer absence of cryptic species, so that their presence is not overlooked in conservation and management decisions. The importance of incorporating parameterized detection probabilities into patch occupancy estimates is crucial when species negatively impact one another or are absent in some seasons.

## **The Effects of Antibiotic Use in Food Animals and the Prevalence of Tetracycline Resistance in Bovine Gastrointestinal Commensal Bacteria**

Jodi L. Dyer

Dr. Susan Sanchez, Athens Diagnostic Laboratory, University of Georgia

Multi-drug resistant (MDR) bacteria are rapidly becoming a threat to medicine worldwide. The genes that confer antibiotic resistance are carried within the chromosome of bacteria or on mobile genetic elements, on which the bacteria may be capable of exchanging these genes, even interspecifically. Often bacteria harboring these genes contain resistance to multiple antibiotics. *tet(A)*, a gene conferring resistance to tetracycline, is one example of a gene that is often clustered with other genes on a single conjugational plasmid within some bacterial strains. The objective of this study was to determine the prevalence of *tet(A)* in both *Salmonella* and lactose-fermenting *Enterobacteriaceae* isolated from fecal samples of dairy cattle located on three geographically separate farms, which were selected because of the therapeutic use of antibiotics that was made available on these farms. Gene-specific screening was performed, and on each farm, the lactose-fermenters demonstrated a carriage rate of 24% or higher, potentially indicative that selection of these MDR bacteria is occurring through therapeutic antibiotic use. In contrast, only a single farm contained *Salmonella* isolates carrying *tet(A)*. The similarity between the *Salmonella* and lactose fermenters on this farm, a 62% to a 64% carriage rate, respectively, suggests that gene transference may be occurring between species within the animals. Given that many food contaminants are derived from fecal material, the development of antibiotic resistant bacterial reservoirs in food animals may be contributing to the increase of resistant strains causing disease in humans, increasing the difficulties of medicinal treatment.

## **Plasse**

Rachel Egger

Prof. Susan Roberts, Department of Graphic Design, University of Georgia



This piece of work began as a mission to come up with an idea for a restaurant that would have a particular environmental concern and to design its menu with this concern in mind. My personal interest in reducing the negative impact of the automobile developed into Plasse, a hypothetical restaurant with a casual atmosphere that would promote bike riding and alternative transportation in general. The name Plasse, which rhymes with “toss,” was derived from the Norwegian word for space and ground. I chose this language because Norwegians are known to

have a deep interest in enjoying and preserving the environment. I began designing the menu with many photographic ideas in mind, but after weeding out many of them I decided to work strictly with Adobe Illustrator to create simple vector graphics from scratch. I wanted the piece's imagery to have a clean feel, which led to its white space, limited color palette, and simple representations of bikes and roads. I took the dotted line and carried it throughout the menu to draw together the text and bicycle parts. For the cover I decided to carry this road theme a step further by actually making the word Plasse abstractly create the dotted line effect over a black background. Once the menu cover and interior were finished, I designed a few promotional items for patrons to use at Plasse and possibly take home with them, including a design for a water bottle. The bottle would fit in a bicycle's bottle holder and could be filled with any drink at a discounted price. The dotted line and simple color scheme were carried throughout each piece to bring them together under the Plasse brand.

### **Calmodulin Activation of Estrogen Receptor $\alpha$ : Cloning and Expression of a Fusion Protein for Defining the Calmodulin Binding Determinants**

Madeline C. Elliott, CURO SCHOLAR  
Dr. Jeffrey L. Urbauer, Department of  
Biochemistry & Molecular Biology, University  
of Georgia

Estrogen dependent breast cancer, accounting for approximately 70% of all breast cancer tumors, requires estradiol-17 $\beta$  ( $E_2$ ) bound to the estrogen receptor  $\alpha$  ( $ER\alpha$ ) to thrive. One of the most common treatments for estrogen dependent breast cancer is antiestrogen hormone therapy using the drug tamoxifen (TAM). In breast cancer tumors, TAM binds  $ER\alpha$ , deactivating it. Initial treatment with TAM is effective, but over time, resistance to TAM is acquired and the cancer reappears. The precise mechanism by which TAM deactivates  $ER\alpha$  or resistance to TAM develops remains unclear. It has been demonstrated that calmodulin (CaM), an important signaling protein, binds  $ER\alpha$  and is

required for normal  $ER\alpha$  transcriptional activity. Because TAM also binds CaM, it is possible that TAM inhibits  $ER\alpha$  function by attenuating CaM activity. As a first step towards elucidating the mechanism of  $ER\alpha$  activation, and the role played by CaM, it is essential to define the CaM binding site(s) on  $ER\alpha$ . We successfully cloned a segment of the  $ER\alpha$  gene (residues 241-320) that we believe contains the CaM binding site(s). We then overexpressed it as a thioredoxin fusion protein, purified it using column chromatography, and most importantly, demonstrated binding to CaM, confirming that our protein contains (a) CaM binding site(s). Successful production of this protein permits delineation of the precise CaM binding site(s) on  $ER\alpha$  and allows for future studies that explore how modifications to the site(s) on  $ER\alpha$  affect binding and activation by CaM. More effective treatments then may be devised to treat or prevent resistant tumors.

### ***The Marriage of Expression and Design***

Hsuan Ju Susan Fang – CURO SUMMER RESEARCH FELLOW

Prof. Christopher Hocking, Departments of Studio Foundations and Drawing & Painting, University of Georgia



As an art student, I have long admired the works by the great Expressionists, from Beckmann to de Kooning, and as a design student I'm deeply captivated by contemporary graphic design and illustration, yet very seldom had I combined the two worlds. The goal for the CURO Summer research was to marry two of my inspirations, expressionism and graphic illustration, creating works that incorporate elements and principles from the two styles. With the art world changing and our visual culture growing, I feel that a crossover between the two worlds is inevitable, if not already present, which makes the research that much more important in furthering my artistic ambitions. My work was achieved through the technique *pentimenti*. By layering loose and improvised curvilinear lines and then covering it with a thin layer of paint, I am able to create a ghost image from which another layer

is based, and create a painterly surface. The process of building and blocking out layers allows for me to find the medium between the depth of expressionism and the flatness of graphic illustration. The act of making improvised lines forces me to think about the composition as both expression and design, in which I edit my own brushstrokes for the sake of aesthetic unity. I have a strong attraction to the chaotic canvas, with clustering bold line work and letter stencils, but in keeping with a design mentality I wanted to find a way of controlling the chaos. By limiting and controlling my color palette and adding in areas of solid color I am able to achieve an environment of controlled chaos.

### **Influence of Bivalves on the Persistence of Avian Influenza Virus in Water**

Christina L. Faust

Dr. David Stallknecht, Department of Infectious Diseases, University of Georgia

Although the transmission of avian influenza virus (AIV) is dependent on an indirect fecal-oral route involving fecal-contaminated water, little is known about the persistence of AIV in aquatic environments. Studies have shown that the infectivity of AIV is temperature, pH and salinity dependent; however, biotic factors have not been studied. The objective of this study is to examine the influence of filter feeding bivalves on the infectivity of AIV in water. In experiments, freshwater clams, *Corbicula fluminea*, were used as model bivalves and collected locally. For each trial, clams were rinsed and individually placed in tissue culture flasks (n=20) containing distilled water that was inoculated (1:100) with a low pathogenic avian influenza virus. Water samples were taken a minimum of three times during 48 hours, and after each trial the clams were processed for microscopic examination with immunohistochemistry (IHC) and *in situ* hybridization. The virus titer of the water samples was quantified by titration in primary cultures of chicken embryo fibroblasts. The virus titer decreased (compared to control flasks) or was undetectable in all 20 flasks where clams

were present. Rapid decreases in virus titers at varying time points suggested the decrease in titer was due to water filtration by clams. The results of this study suggest that biotic factors within the environment, specifically filter feeders, impact the persistence, and thus infectivity, of AIV. Studying the impact of filter feeders on the epidemiology of AIV will help develop an understanding of the maintenance of AIV within wild aquatic bird populations.

### **The Interaction of Natural Killer Receptor + T-cells with *Campylobacter jejuni***

Yayne Fekadu

Dr. Joan O'Keeffe, Department of Biochemistry, National University of Ireland, Galway

Natural Killer receptor+ T cells (NKR+ T-cells) are a unique subpopulation of T-cells that share characteristics of Natural Killer cells. This subpopulation of cells recognizes self and foreign glycolipids presented by CD1d. Their ability to rapidly produce cytokines led scientists to believe that NKR+ T-cells may have a role in infection and immunity. The aim of this study was to investigate the effects of lipopolysaccharides (LPS) derived from *Campylobacter jejuni* on NKR+ T cells from human peripheral blood using flow cytometry and ELISAs. Peripheral blood mononuclear cells were stimulated with *C. jejuni* LPS fractions (HS:2, HS:3, HS:4, O:19, O:23, and HS:41) for 24, 48, and 72 hours. Activation marker expression (CD25) was studied on NKR+T cells by flow cytometry and IFN $\gamma$  levels measured in culture supernatants using ELISA. The results showed that all of the LPS fractions used increased CD25 expression on NKR+T cells after 48 hours in culture. IFN $\gamma$  levels were also increased upon stimulation with each of the LPS fractions tested. In conclusion, the responses of NKR+ T cells to *C. jejuni* may be important in diseases associated with infection. Further studies are warranted.

### **Characterization of Putative Genes that Encode the Enzymes Arabinose Kinase and Galactose Oxidase: Enzymes Involved in the Biosynthesis of Sugar Nucleotides**

Zion Firew

Dr. Maor Bar-Peled, Department of Plant Biology, University of Georgia

The defining feature of plants, the cell wall, affects all aspects of plant morphology, growth and development. Cell walls surround the plant cell and provide structural support and protection. They play vital roles in our environment and society in their use as a source of food, fuel and fiber. They are complex structures made up of polysaccharides, proteins and lignin. The major polysaccharides in the primary cell walls are cellulose, hemicellulose and pectin. Pectin contains three major polysaccharides that are thought to occur in all primary cell walls, and these are homogalacturonan, rhamnogalacturonan-I and rhamnogalacturonan-II. The main objective of this ongoing project is the biochemical characterization of the enzymatic roles of several putative enzymes involved in the synthesis of nucleotide sugars and polysaccharides. Nucleotide sugars are activated monosaccharides used to synthesize polysaccharides. Some of the major identified sugars that make up this cell wall include glucose, rhamnose, galactose, xylose, arabinose, and galacturonic acids. Our lab studies candidate genes that may encode enzymes that catalyze the synthesis of sugar nucleotides. Our model plant of study is *Arabidopsis thaliana* whose genome sequence is known. However, the study of function of all the genes is still lagging behind. In this project, the identified gene Ara1, for Arabinose Kinase and novel gene, at3g5359, which is a putative galactose oxidase (GalO) are studied and characterized to understand their role in the biosynthesis of polysaccharides. Arabinose Kinase catalyzes the phosphorylation of the arabinose sugar into arabinose-1-phosphate. Though this activity was studied before, it is unknown if this catalytic activity is specific only for arabinose. The putative galactose oxidase gene is going to be

characterized both *in vivo* and *in vitro* to analyze its function in the synthesis of sugar nucleotides. This project will focus on the verification of the genes, and the process of cloning and characterizing to study its function.

### **Mathematical Computing: Exploring the Relationship between the Critical Group and Structure of Graphs**

Grant M. Fiddymont

Dr. Dino Lorenzini, Department of Mathematics, University of Georgia

In mathematics, a graph is a collection of vertices and edges between them. The number of spanning trees of a graph is a standard invariant attached to it. It turns out that this integer is, in fact, the number of elements in an algebraic structure associated with the graph called the critical group. Although this group has applications to economics and physics, the precise relationship between the algebraic structure of the group and the combinatorial properties of the graph is not yet well understood. For instance, the simplest possible group structure is the one where the group needs only one generator – that is, it is cyclic. It would be interesting to understand how often the critical group of a graph is “as simple as possible.” As part of the Vertical Integration of Research and Education (VIGRE) Graph Theory Group, several approaches to this problem have been studied, including calculation of the Smith-Normal form of the graph’s Laplacian as well as computer-assisted computation. In particular, using the published list of the millions of graphs with at most 11 vertices, a comprehensive list of the explicit structure of the critical group of these graphs is being created using the computer software “nauty” and Maple. This work required writing Maple procedures to compile data, later refined to take into account the sheer size of the input. A statistical analysis of this data, which will hopefully provide some insight on how often critical groups are cyclic, will be presented.

### **A GP-evolved Formulation for the Relative Permittivity of Water and Steam**

Sergey V. Fogelson

Dr. Walter Potter, Department of Computer Science, University of Georgia

The relative permittivity (or static dielectric constant) of water and steam has been experimentally calculated at a relatively wide range of temperatures and pressures. Two separate functions for predicting the relative permittivity of water and steam in three distinct thermodynamic regions were evolved using genetic programming. A data set comprised of all of the most accurate relative permittivity values, along with temperature, pressure, and density values from the entire experimentally calculated range of these values was used for this task. The accuracy of these two functions was evaluated by comparing the values for the relative permittivity obtained using the GP-evolved functions and the values obtained using the latest dielectric constant prediction equation to the experimentally obtained data set. In all regions, the newly evolved functions outperformed the latest dielectric constant prediction equation in terms of difference between calculated and experimentally obtained values for the dielectric constant. This work heralds the successful beginning of applying AI techniques to this important scientific application area.

### **A Cellulosic Ethanol Plan for Athens**

Zach Fox – ROOSEVELT @ UGA

Dr. Thomas Adams, Department of Biological & Agricultural Engineering, University of Georgia

The U.S. transportation sector’s reliance on fossil fuels increases American dependence on foreign oil, pollutes our air, contributes to global climate change, and is generally unsustainable. An alternative to fossil fuels is cellulosic ethanol which is a cleaner-burning fuel blended with conventional gasoline and may be produced from biomass. Mixed-stream paper, consisting of newspaper, office paper, and other discarded paper products, is readily available biomass in the University of Georgia community and will

serve as the raw material for ethanol production in this proposal. This paper proposes a comprehensive plan to be implemented to increase research on and production of cellulosic ethanol. The objectives of the plan are to 1) provide University vehicles with cleaner burning ethanol-blended fuel and 2) decrease waste streams of paper to local landfills and recycling centers. The success of this plan hinges upon implementation of three interdependent plans of actions: 1) completion of a facility capable of pilot-scale ethanol production; 2) a stronger university-wide recycling initiative implemented to ensure a reliable, consistent supply of feedstock; and 3) an increase over time of the quantity of ethanol blended with gasoline corresponding to the production capabilities of the research facility. By coordinating varied parties and interdependent initiatives, this plan ultimately will provide University vehicles with a clean fuel alternative, increase campus recycling efficiency, and promote scientific and commercial advancement of cellulosic ethanol. Furthermore, using Athens and UGA as a model, we seek to demonstrate this plan's applicability to the nation.

**Investigation of the Genetic Population Structure of the Canine Hookworm, *Ancylostoma caninum***

Mary B. Gassama

Dr. Ray Kaplan, Department of Infectious Diseases, University of Georgia

Hookworms are intestinal nematode parasites that feed on the blood of the host, resulting in various ailments such as iron-deficiency anemia and malnutrition causing stunted growth and mental retardation in children. Mass treatment of communities with anthelmintic drugs can greatly reduce morbidity and infection prevalence, but also bears the danger of selecting resistant alleles, which could render whole parasite populations irresponsive towards the drug. To investigate the development and spread of resistance, it is necessary to understand the population structure and genetics of hookworms. This project is focused on population genetics of canine hookworms as a model for human

hookworms. In order to get a better understanding of the population genetics of hookworms, it is necessary to analyze hookworm DNA. DNA genetic markers, isolated from adult hookworms and eggs samples and amplified by PCR, are analyzed for allele changes. Parasite populations and relations between them are estimated by bioinformatics approaches. Finally, presence of resistant hookworms will indicate a need to adjust the method currently used to administer hookworm treatment drugs.

**Effects of 8-2 Fluorotelomer Alcohol on Gene Expression and Pregnancy Outcome in Mice**

Gabrielle D. Gay – CURO APPRENTICE

Dr. Mary Alice Smith, Department of Environmental Health Science, University of Georgia

8-2 fluorotelomer alcohol (FTOH) and its stable metabolites, perfluorooctanoic acid (PFOA) and perfluorononanoic acid (PFNA), are developmental toxins that result in early pregnancy loss as well as poor neonatal growth and survival. Previous work in our laboratory has determined that treatment with 8-2 FTOH results in neural tube defects (NTDs), manifesting as either anencephaly or exencephaly in CD-1 mice. The objective of our current study was to investigate the mechanism of NTD induction by 8-2 FTOH using the inbred LMBc mouse. These mice are highly susceptible to birth defects due to genetic alterations in sphingolipid biosynthesis, which regulates both cell growth and cell death. Pregnant LMBc mice received a single gavage dose (30 mg/kg·BW 8-2 FTOH) on gestational day (GD) 8. Mice were sacrificed on GD15 and tissues excised for analyses. Subsets of fetal and placental samples were fixed in RNAlater® for gene expression analysis with RT-PCR. Preliminary data suggest that following treatment, maternal weight gain was not affected by 8-2 FTOH. However, 8-2 FTOH resulted in both increased absolute and relative liver weight in treated dams. Treated dams had an increased number of late-stage resorptions, thus decrease in litter size (75 % incidence). Our data suggest that LMBc mice,

unlike the previously studied CD-1 mice, are more likely to abort affected fetuses. Future work will include looking at gene expression alterations in pathways governing metabolism, growth and development, as well as stress and toxicity.

### **Escalation or Acquiescence? An Analysis of Sequential Dissident Responses to Repression in Indonesia**

Andrew I. Gladden & Patrick Bentley  
Dr. Stephen Shellman, Department of  
International Affairs, University of Georgia

This study evaluates the relationship between government repression and dissident tactics. It is based on statistical data collected from Indonesia through Project Civil Strife under the direction of Dr. Stephen Shellman. It is important to note that the particular country chosen is not what is being studied. Instead, the goal is to apply a new statistical test to the government-dissident data from this country. This test, known as a difference of means test, begins by assigning values to particular events based on a spectrum ranging from very hostile to very cooperative. For each instance of repression, both pre-repression and post-repression values are recorded. These values are then averaged over the 25-year period studied and the difference between the two means can then be used to determine trends in behavior. For the purposes of this study, cooperation is defined as an event that is considered positive in the context of the overall government-dissident relationship. Conversely, hostility is defined as an event that is considered negative in the context of that same relationship. This study is motivated by a desire to quantify and statistically analyze the levels of hostility and cooperation among dissidents in response to government repression. More simply, does government repression of dissident cooperation yield a substitution of tactics toward hostility? Does Government repression of dissident hostility yield a substitution of tactics toward cooperation? It is believed that dissidents will reduce their cooperation levels and increase their hostility following government repression of

cooperation. Additionally, repression of hostility will cause dissidents to increase their cooperation levels and decrease their hostility levels. Statistical analysis of data from Indonesia from 1980 – 2005 corroborates both hypotheses.

### **Differentiation of Human Embryonic Stem Cells to a Vascular Phenotype**

Elizabeth A. Godbey  
Dr. Steven Stice, Department of Animal & Dairy  
Science, University of Georgia

Human embryonic stem cells (hESC) from early blastocysts are self-renewing cells capable of differentiating into every cell type present in the human body. They are a promising source of cells which may help develop treatments for human heart and vascular disorders. This project attempted to derive endothelial cells, the cells lining blood vessels, from hESC using four differentiation protocols. On day zero of the experiment, undifferentiated hESC colonies were transferred to laminin-coated tissue culture dishes. After 21 days of differentiation, the cells of each protocol were harvested and tested for expression of 47 genes by real-time PCR using a low-density array card. A portion of the harvested cells were replated on microscope slides for immunostaining with hESC and endothelial markers. The undifferentiated hESC, umbilical vein endothelial cells, microvascular endothelial cells, and hepatoma cells (all of human origin) were used as controls for both gene expression and immunostaining studies. Gene expression data was procured using SDS2.2.1 software and analyzed by the SAS package. Differentiated cells on slides were detected using fluorescent microscopy. Images were acquired with an Olympus Disk Spinning Unit. Both low-density array data and immunostaining images will be considered when evaluating the efficiency of the endothelial cell production from hESC by different protocols. Further refinement of protocols will be made to find the best method. The present project will potentially bring to light new ways of studying *in vitro* human angiogenesis, and thus would have a strong impact on future cardiovascular health strategies.

### **An Investigation of Botulinum Neurotoxin Interactions on RhoA Activity Using *In Vitro* Assays**

Courtney Grant – CURO SUMMER RESEARCH FELLOW

Dr. Julie Coffield, Department of Physiology & Pharmacology, University of Georgia

Botulinum neurotoxin, the most poisonous substance known, primarily causes paralysis. It was observed that muscles treated with botulinum neurotoxin serotype A demonstrated the emergence of active nerve sprouts (neurites) from poisoned nerve endings. We believe that this finding may actually hold the key to the identity of the receptor for this toxin serotype. Dr. Coffield's team has preliminary evidence, obtained through affinity precipitation assays using homogenates of neuromuscular tissue, that neurotoxin serotype A binds a protein receptor known as NgR2 (Nogo Receptor 2) which is known to regulate axonal growth within the central nervous system via three ligands. One of these ligands, myelin associated glycoprotein (MAG), is also found in the peripheral nervous system, where its action is not as well understood, but in the CNS MAG's binding to NgR2 has been reported to activate RhoA, a small GTPase that ultimately regulates neurogenesis. In the current study, the action of botulinum serotype A on RhoA activity on tissue homogenates of the PNS were observed. Changes in RhoA activation from treatment with MAG and from the toxin were measured with the aid of absorbance- and/or luminescence-based ELISA kits designed to selectively detect activated RhoA. If competition assays using MAG and toxin confirm that any observed effect on RhoA activation is mediated by the selective binding of serotype A to NgR2, then NgR2 is a functionally significant receptor for botulinum neurotoxin. The ultimate goal of this study is developing therapeutic countermeasures that may be used in the event of toxin exposure.

### **Features of Nicaraguan Spanish**

Katie Griffith – CURO SUMMER RESEARCH FELLOW

Dr. Diana Ranson, Department of Romance Languages, University of Georgia

This study investigates the use of noun, pronoun and null subjects in Nicaraguan Spanish through a quantitative analysis of a corpus of natural speech recorded in Jinotepe, Nicaragua in the summer of 2005. Knowledge of Nicaraguan Spanish is scarce, yet this dialect can provide a valuable point of comparison to studies of subject expression in other dialects of Spanish. For example, a widely debated issue is the functional compensation hypothesis, whether subject pronouns tend to be used when a final /s/ is dropped from a second person singular verb form, so that a speaker who says [a-bla] for *hablas* would be more likely to add a subject pronoun and say *tú hablas* [tu-a-bla]. This claim has been made for Puerto Rican Spanish, in which final /s/ is often deleted, yet it has been disproved by studies of Andalusian Spanish, an /s/-deleting dialect in Southern Spain and by studies of non-/s/-deleting dialects in Spain and Los Angeles. It is therefore interesting to determine the status of subject expression in Nicaraguan Spanish, which is an /s/-deleting Central American dialect which belongs neither to the Caribbean nor to the Southern Spain dialect area. In addition to determining the contribution of Nicaraguan data to the functional compensation hypothesis, this research analyzes additional hypotheses as well concerning the effect on subject expression of previous reference, contextual knowledge, and pragmatic functions, such as contrast, turn initiation, topic introduction, and the speaker's personal attitude. My research entails analyzing a self gathered corpus of native speech in order to show a correlation between a lack of subject nouns and pronouns and previous subject reference, implicit contextual knowledge, and the presence of these subjects to indicate contrast, turn initiation, topic introduction and the speaker's personal attitudes to the topic of discussion.

### **Systematic Empirical Study: The Impact of Sri Lanka's Economy on Dissident Behavior**

Susan S. Guo – CURO APPRENTICE

Dr. Stephen Shellman, Department of International Affairs, University of Georgia

Dissident rebel behavior plays a large role in today's society. Dissident rebels' actions stem from various factors. My project focuses on the economic factor, which is debated in the literature. I am observing how the economic circumstance of Sri Lanka may affect domestic suicide terrorist acts. My project branches off of Project Civil Strife, which is headed by Dr. Stephen Shellman. Project Civil Strife furthers our battle against terrorism by conducting research to analyze the motives of domestic terrorist activities of rebel groups. Researchers working with this project are seeking to develop theories to explain and predict patterns of dissident group tactics and actions. It is essential for researchers to better explain terrorist actions so that we can develop effective techniques in combating terrorism. I chose the economy as the independent variable because it involves money, a large influence of many people's decisions. My project involves the collection of two aggregate data sets: suicide bombing events and economic statistics (monthly inflation, trade balance with the US). I will examine the evolution of Sri Lanka's economy from 1980 to 2006 and observe how the economy affects the frequency of suicide bombing attacks. I predict adverse economic conditions will increase suicide bombing while improving economic conditions will lessen it.

### **Intracellular Gene Transfer from the Mitochondrion to the Nucleus in *Toxoplasma gondii***

Erica M. Hall – CURO SUMMER RESEARCH FELLOW, CURO SCHOLAR

Dr. Jessica C. Kissinger, Department of Genetics, University of Georgia

(Erica M. Hall, Chih-Horng Kuo, Abhijeet A. Bakre)

*Toxoplasma gondii* is a unicellular, eukaryotic apicomplexan parasite that causes

toxoplasmosis, a widespread disease capable of causing serious health problems in immunocompromised individuals and pregnant women. *T. gondii* is a model protist parasite because of its genetic accessibility, ease of experimental use, and available genome sequences. *T. gondii* presents a unique opportunity to study the phenomenon of intracellular gene transfer between organellar and nuclear compartments. The *T. gondii* nuclear genome contains ~7,200 assorted fragments of its mitochondrial genome, accounting for up to 1%, depending upon the level of conservation, of the nuclear genome sequence. The focus of my research is to elucidate the mechanism(s) by which NUMTs (nuclear sequences of mitochondrial origin) arose in *T. gondii*. Our hypotheses include a mechanism of continual transfer of fragments over evolutionary time, or a few original transfers followed by subsequent fragmentation and multiplication within the nuclear genome. My computational research supports the former since NUMT sequence containing a 60-100% gradation of conservation with mitochondrial genome sequence are observed. Genomic southern blots confirmed the large number of NUMTs. My sequence analyses have discovered multiple 40-200bp repetitive elements encoded by the mitochondrial genome that may be facilitating transfer; however, this remains to be verified via analysis of the target insertion sites in the nuclear genome. The completion of this project will increase our understanding of genome evolution in this organism and the process of intracellular gene transfer.

### **Metal-Metal Bonds and Aluminum Clusters**

Adele Handy – CURO SUMMER RESEARCH FELLOW

Dr. Gregory Robinson, Department of Chemistry, University of Georgia

Metal clusters on the atomic level provide insight into the behavior of the bulk metal. In an organometallic reaction, the ligand plays a very important role by stabilizing, protecting and influencing the resulting metal-metal bond. Upon formation of a metal-metal bond, the solution must be crystallized in order to further

study the composition of the air and moisture sensitive compound. During my summer research, I attempted to create two different crystallized compound with unique ligands attached, in order to characterize and analyze the resulting bonds. For one of the ligands, if crystallization occurred, an interesting aluminum cluster could have been the result. Two different ligands were investigated: triphenylmethyl lithium and isobutylaluminum dichloride. After being synthesized, triphenylmethyl lithium was reacted with the metal compound gallium trichloride and then underwent a sodium reduction. After the reactions were performed, the conclusion was reached that the triphenylmethyl gallium trichloride reduction failed. Although a dark reddish brown solution was obtained, crystals did not form, and the composition of the solution could not be analyzed. The second compound, a commercially made isobutylaluminum dichloride, was reduced during separate trials using potassium, sodium, and lithium. The attempted crystallization of the varying reductions of the isobutylaluminum dichloride was not successful either; no aluminum clusters formed. Through this research, I reached the conclusion that these two ligands are not good candidates for synthesizing compounds which can be crystallized for analysis.

### *The Face of Costa Rica*

Comusina Celan Hardman – CURO SUMMER RESEARCH FELLOW

Prof. Joseph Norman, Department of Drawing & Painting, University of Georgia



In eight months, I became intertwined with the vibrant culture of Costa Rica; visitors cannot help but appreciate the subtle differences of the various regions in both the landscape and the people. Costa Rica is said to be the harmonious meeting of opposites: the meeting of flora, fauna, and bird life from both the northern and southern hemispheres, but also, a harmonious union of the ideas of different groups in Costa Rica. The population of Costa Rica is an interesting combination of old traditions and new ideas spiraling together to create a group who spends hours preparing gallo pinto for twenty unexpected extended family members, but also those who are fascinated with the microwave and the iPod. Like the United States, Costa Rica has become immune to the growing development and the booming tourism industry; they accept the necessity to learn English and the McDonald's located directly beside

historical monuments as part of their world. Through a series of journal entries, sketches, interviews and paintings, I wove together the unique personalities that represent Costa Rica, the faces who make a country whole. I captured the stories of those who are initially hidden from view in the tropical paradise. Their stories are told through pictures and words; the story of a man with a long white beard who traveled to parque central every day for thirty-five years to play games with children; the story of an unorthodox female artist who traveled the world just to return to Costa Rica to open a gallery of her own; the story of a family of Nicaraguan immigrants who took the yearly pilgrimage to Cartago to observe Costa Rican traditions. These are the people of Costa Rica who are found in a landscape trying to find a balance between development and preserving the natural beauty that brings over a million tourists a year. Each painting and sketch contains brilliant colors that reflect the animated nature of Costa Rica; the layers of circles and squares represent the many pieces that make up not only the image but also the country. My hope is to use the interest evoked by my paintings to bring awareness to the results of development in Costa Rica and keep a visual record of a previously more tranquil society. My work helps to capture and preserve pieces of Costa Rica that will continue to change and possibly disappear under the hands of outside influences within the next decade.

### **Creation of a Computer Game from Concept to Completion**

Brian L. Harper

Dr. Mike Hussey, Department of Theatre & Film Studies, University of Georgia

The purpose of this thesis/project is to showcase my visual and audio works in one interactive multimedia application, or computer game. The concept of the game focuses on new ways for the user to interact with the computer. The standard mode of interaction with a computer involves pressing a button which translates abstractly to some action such as jumping or shooting. With the recent release of the

Nintendo Wii, human-computer interaction is becoming more intuitive. For instance, swinging the Wii Remote during a tennis game will swing the racquet on screen. The goal of my project is to build on this one-to-one relationship between human action and computer reaction. Through the use of a glove and webcam, the user's hand movements are tracked and converted to digital data. A 3D model of a hand on the screen follows the movements of the user's hand by interpreting that data. The user must control the hand to defeat various enemies and obstacles before completing the level. The user is able to smash through obstacles by making a fist, shoot enemies by pointing fingers at them, and pick up items by grasping them between fingers. Through the process of creating the game, I became familiar with all aspects of producing an interactive computer game from start to finish. Additionally, I hope new modes of human-computer interaction can be applied to not only computer games, but all fields of study.

### **Site-mapping and Glycan Characterization of Functional Alpha-Dystroglycan**

Sana Hashmi – CURO APPRENTICE & CURO SUMMER RESEARCH FELLOW

Dr. Lance Wells, Department of Biochemistry & Molecular Biology, University of Georgia  
(Sana Hashmi, Stephanie Hammond, Jae-Min Lim, Kazuhiro Aoki, Mindy Perlman, Gerardo Gutierrez-Sanchez, James Wheeler, James M. Ervasti, Carl Bergmann, Michael Tiemeyer, Lance Wells)

Alpha-Dystroglycan (aDG) is a highly O-mannosylated glycoprotein that in a multiprotein complex serves as a bridge between the intracellular cytoskeleton and the extracellular matrix. In several forms of congenital muscular dystrophy, mutations exist not in aDG but in the glycosyltransferases necessary for the O-mannose addition and extension of the glycan structure necessary for proper aDG function. Hypoglycosylated aDG has also been associated with oncogenesis and metastasis. Given the importance of glycosylation of aDG in disease, the work presented here is our current progress in fully site mapping and characterizing the

glycans on aDG isolated, initially, from rabbit skeletal muscle. The sites of glycosylation are being mapped using mass spectrometry techniques for O-glycosylation including neutral-loss MSn directly on the glycopeptides and beta-elimination/Michael addition approaches. Released permethylated glycans are also being characterized by MSn approaches. The project's glycan analysis and site-mapping data to date include several O-Man and O-GalNAc initiated structures on multiple residues of aDG. Furthermore, a laminin-1 binding assay using surface plasmon resonance has been developed, which has been used to show binding of the aDG preparation. Currently using a host of glycosidases, the glycans necessary for aDG interaction with laminin-1 can be elucidated. Using all of this information, the project can determine the key functional sites of modification and glycan structures on aDG for laminin-1 binding. Following mapping and characterization of the glycans of aDG from rabbit muscle, aDG glycosylation will be studied in other tissues, tumors, and mouse models of congenital muscular dystrophy. This work is supported by the Muscular Dystrophy Association (LW) and the Jane and Bill Young Summer Fellowship (SH).

### **A Universal Language? Translation and Cultural Imperialism in the Writings of Karl Vossler and Alphonse Daudet**

Elizabeth K. Hebbard

Dr. Martin Kagel, Department of Germanic & Slavic Languages, University of Georgia

Karl Vossler, an early 20th century German humanist and philologist, had a unique appraisal of the art of translation: he considered it cultural imperialism, where a literary work is forcefully annexed by the target language community and occupied by an army of its own readers. He claimed that this is partly due to the intense connection between cultural identity and language which is disrupted or dislocated in translation. My paper explores this connection and its function in translation by analyzing a short story of Vossler's contemporary, Alphonse Daudet. I will illustrate Vossler's position on the

imperialistic nature of translation, using the story to parallel its subject matter: the colonization of a language community; and to provide examples for cultural considerations in translation. I will then address Vossler's idea of a "universal language," inquiring whether translation adds to the literary value and experience of the translated work by providing another concrete facet of its realization. I will demonstrate that Vossler and Daudet's conceptualization of the language-identity relationship is not only contradictory, but also exaggerated due to the bias of personal experience. Both men represent an era when language was essential to establishing cultural identity, and I will show that their claim that this identity is constructed exclusively through language is untenable; that the relationship between language and cultural identity is more multi-faceted than they make it out to be; and that translation is a means of adding to the pool of universal knowledge rather than a form of cultural imperialism.

### **RGS Proteins Regulate LPA Signaling in Ovarian Cancer Cells**

Paul A. Henkel

Dr. Shelley Hooks, Department of Pharmaceutical & Biomedical Sciences, University of Georgia

Ovarian cancer is the most fatal form of gynecological cancer in the world. Characterized by the uncontrolled growth and proliferation of tissue in the ovary, ovarian cancer has a five-year 70% mortality rate following preliminary detection. Most patients who are afflicted by ovarian cancer are symptomatic only in advanced stages, showing abdominal swelling caused by a build up of Ascitic Fluid. It has been found that Ascitic Fluid contains increased levels of Lysophosphatidic Acid (LPA). LPA is an intercellular lipid mediator that promotes increased stimulation of cell proliferation, cell survival, and tumor cell invasion in ovarian cancer cells. LPA has been shown to interact with specific receptors coupled to G-proteins embedded in the cellular membrane (specifically LPA1, LPA2, and LPA3). Regulators of G-

protein Signaling (RGS proteins) are inhibitors of G-protein activation that act by binding to G-proteins and stimulating GTPase activity, effectively terminating G-protein activity. The goal of this project is to gain insight into the possible effect of RGS proteins in LPA induced cellular signaling, specifically the production of cyclic adenosine monophosphate (cAMP) which is a constituent in the cellular signaling pathway that regulates proliferation. Our strategy involves the use of the cAMP assay to measure LPA effects on Gi-coupled cell signaling in the SKOV3 strain of ovarian cancer cells. Since the beginning of the project, we have successfully produced mutant cells that are resistant to regulation by RGS proteins. Preliminary data suggest that RGS proteins are involved in the physiology of ovarian cancer in the SKOV3 cell line. Our future work will include the quantification of the RGS involvement in the signaling pathways of the SKOV3 strain as well as other variations of ovarian cancer cells.

## **NERUDA**

Carol M. Herbert

Prof. Susan Roberts, Department of Graphic Design, University of Georgia



Pablo Neruda was a Nobel Prize winner, a poet, and a champion of the “everyman”. He wrote poetry for the masses so that everyone could enjoy the beauty of words. Pablo Neruda used words to unite “the community of man.” This menu was designed for a restaurant modeled after the ideals of Pablo Neruda, hence the name NERUDA. The concept of the restaurant was a place where intellectuals and creatives could mingle and mix, enjoying food and drink from all over the globe. In the spirit of Pablo Neruda, this restaurant would donate a certain percentage of its proceeds to literacy foundations around the world, in the hopes of spreading the gift of words. The visual concept for this menu came simply from the pages of a book. I used photographs I took for the background visual. I

wanted the letters of the identity to reference these pages. I used the repetition of lines to bring the typography out, as well as the geometry of the letters to add color in an unexpected way. This line motif is repeated on the interior spreads, as well as the geometric shapes created by the letter forms. My hope in doing this was to have a literary feel in the design. To me design is about incorporating conceptual and visual elements—the symbols and the form—to create a balanced harmony with purpose. It's about seeing what is not there and creating anew. When I approach a design problem, I am always keeping these principles in mind. I look at the elements that need to be involved and try to create a scenario of harmony through balance. I try to look at the thing with an abstract eye and see if the composition and color are pleasing. I think of the main point I am trying to make, and then try to show it in an intelligent way. I focus on the negative space—the underlying ideas we do not actually see but which in fact communicate the message—and try to bring them to light.

***Hand to Mind Coordination.***

Cassie L. Hester  
 Prof. Susan Roberts and Prof. Alex Murawski,  
 Department of Graphic Design, University of Georgia



*Doodle*, as defined by *Webster's Dictionary*, is "a rough drawing made absentmindedly." Doodling is a brain-storming methodology. The notion of churning out solutions whilst scribbling may seem like wishful thinking, but I find that it relaxes me and allows my brain creative freedom. Compositions, imagery and patterns are often the result of my "absentminded" endeavors. Other times, words

and concepts are evoked through this meditative practice.

Shoe illustrations  
 Ink and watercolor  
 8 in. x 12 in.  
 2007

**Birdsong in the Minnesang Tradition:  
 Natural Imitation and Symbolic Association**

Sojourner Hodges  
 Dr. David Schiller, Department of Musicology  
 & Ethnomusicology, University of Georgia

Since the times of the ancient Greeks and Romans, the natural world and its inhabitants have been the source of endless fascination within the arts; as early as 414 B.C.E., Aristophanes utilized live bird vocalizations in his comedy *The Birds*. Perhaps because birds are the original songsters, birdsong has long held sway over composers. One of the most remarkable periods of interest in birdsong was during the Minnesang (a tradition of lyric song in Germany that flourished from the 12th century through the 14th century). Two composers of the Minnesang era, Walther von der Vogelweide and Oswald von Wolkenstein, used birdsong in dramatically different ways. In analyzing Oswald von Wolkenstein's song "Der Mai mit lieber zal" and Walther von der Vogelweide's song "Unter der Linden," I will attempt to isolate and discuss the various birds therein, their respective roles, their literal and symbolic representations, and their diverse impacts on the two composers. Furthermore, I will examine both composers' use of not only their own imaginations in assigning roles to specific birds, but also of their use of traditional folkloric portrayals of the characteristics of various birds. These two composers and their use of birds and birdsong provide a unique glimpse into the naturalistic atmosphere of music in the Minnesang era.

***The Integration of Aesthetic Principles and Human Movement***

Mia Holtzman

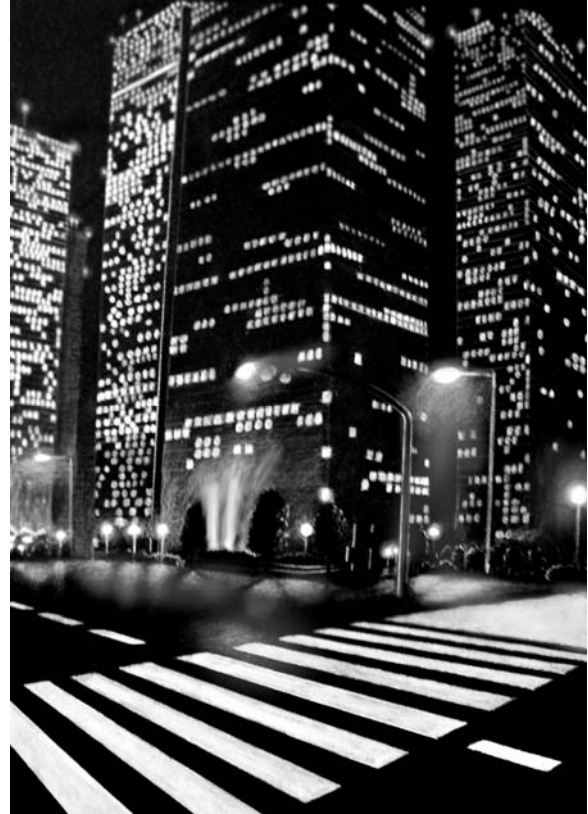
Professor Bala Sarasvati, Department of Dance,  
University of Georgia

My current project involves the exploration of common choreographic vocabulary while integrating the ideals of basic human movement to create a dance form of both novelty and predictability. Movement based merely on traditional technique has the potential of becoming monotonous. Therefore, my composition expands on the works and teachings of conventional choreographers by fusing ballet and modern with distinctively different human expressions and actions. I believe the non-literal story I express through my movement may portray feelings and experiences shared by many. My objective was not to dance in a way that the obvious becomes evident, but rather to perform with the passion instilled from the lyrics. The result of assimilating communal human emotion and gesture with time-honored technique is a dynamic and thought provoking display of what new age dance can accomplish.

***It's lonely out here***

Matt Howell

Prof. Alex Murawski and Prof. Susan Roberts,  
Department of Graphic Design, University of  
Georgia



In art, as well as life, we should all strive for clarity whether it is clarity of image on the canvas or clarity of mind when facing adversity. In artistic endeavors the final piece is what one sees as the artist's lucid vision, but it is not. It is a crystal representation of the viewer's perception. As soon as the artist completes a work for display it no longer belongs to them; it is a limpid mirror that we all own and use to look into ourselves.

Conte and colored pencil on black illustration board

12 in. x 24 in.

2005

### **Epistatic Interactions among Long-lived *Drosophila melanogaster* Mutants**

Annie Huang

Dr. Daniel Promislow, Department of Genetics,  
University of Georgia

Several different theories exist to explain the causes of aging. One of these theories, the mitochondrial theory of aging, states that all cells naturally produce and build up harmful free radicals such as reactive oxygen species. In recent years, scientific research has discovered numerous life-extending mutations in *Drosophila melanogaster* populations, many of which exhibit a strong resistance to various stresses such as oxidative stress. The purpose of this experiment is to discover whether combinations of unique long-lived mutations affect life span and also oxidative stress resistance. We will study three distinct life-extending mutations, where each acts in a unique pathway: Indy, EcR, and Enigma. Different pathways are key because if two mutations act in the same pathway, then the resulting reaction towards a particular stress is likely to be similar to the reaction of the control population containing a single mutation. We hypothesize that the combined mutant lines will display the strongest tolerance toward oxidative stress and the greatest lifespan extension. Along with the combined mutant lines, we will create three different control lines. First, each control background will be crossed with each different control background; second, each mutant line will be crossed with its own control background; and third, each mutant line will be crossed with different genetic backgrounds. At this point, our data are still being analyzed. We chose to perform an oxidative stress assay due to the fact that all living organisms produce harmful free radicals and also to reach the ultimate goal of understanding the aging process better. With a greater understanding of genetic processes, a greater understanding of human health follows. Currently, we know much about these genes' pathways of action. Furthermore, epistatic interactions between mutations that act in the same pathway have also been elucidated; however, interactions between mutations that act

in different pathways have yet to be thoroughly studied.

### **Magnitude of the Inverse Relationship between Nighttime Transpiration and Hydraulic Redistribution in *Quercus laevis***

Margaret A. Hubbard

Dr. Lisa A. Donovan, Department of Plant  
Biology, University of Georgia

C3 plants use stomatal regulation to prevent unnecessary water loss, and recent studies have shown significant nighttime stomatal conductance and water loss in C3 plants. Another process, hydraulic redistribution involves water flowing from the wettest soil layers through the plant to drier regions in the soil. Because nighttime transpiration contributes to water loss in a plant, we hypothesized that by minimizing water loss through this process, hydraulic redistribution can be maximized. This hypothesis was tested in a greenhouse study using *Quercus laevis*. Plants were grown with their root systems split between two adjacent pots. The magnitude of water hydraulically redistributed between the pots was quantified using screen cage psychrometers, which measure availability of water for plant uptake. Treatment involved bagging plant canopies on alternating nights to suppress nighttime transpiration. The results were found to be insignificant. However, a previous parallel study with *Artemisia tridentata* found significant evidence to support the same hypothesis. Because water is required for photosynthesis and the absorption of essential nutrients from the soil, a further understanding of the process of hydraulic redistribution could offer insight into how plants interact with their environments to obtain these essential materials. Also by studying different species, we can gain a better understanding of how hydraulic redistribution differs between species from similarly dry habitats.

**Taking *Clostridium thermocellum* ORFans from the ORFanage and Crystallizing Them in Search of Possible Novel Folds**

Justin L. Hula – CURO SCHOLAR

Dr. Claiborne Glover, Department of Biochemistry & Molecular Biology, University of Georgia

As the number of sequenced genomes increases, the number of ORFs, open-reading frames that could potentially encode a protein continues to grow. Among this collection of ORFs lies a group of singleton ORFs, cleverly deemed singleton ORFans, which have not been found in other genomes. New sequence discoveries continue to further subdivide these ORFs: non-ORFans are found to be homologous in other families, orthologous ORFans are found only in the organism's family, and paralogous ORFans are found only in the organism's species. These unique singleton ORFans may then hold an insight into why organisms are different from each other. The goal of this work is to express, purify and crystallize a protein containing novel fold from selected singleton ORFan targets. Three singleton ORFans have been cloned in Top10 *E. coli* cells, expressed in BL21 (DE3) RPX cells, and purified with Nickel columns and Gel filtration. Work is underway to crystallize the transcribed protein from these singleton ORFans, and we hope to possibly identify a novel fold from the crystal structure. Dr. B. C. Wang's lab has achieved a forty percent success rate of identifying novel folds of the proteins in these singleton ORFans via crystallography. A crystal structure of these proteins will allow research into how they interact with other proteins in vivo. In general, knowledge of novel folds will allow a fuller understanding of these interactions and may ultimately uncover cures for diseases such as HIV/ AIDS, ataxias, Alzheimer's, and cancer.

***Living in Fire, Ice, and Cardboard; Hotter'N Hell; Green with a Cowboy Print; and Thanksgiving with the Pope, Popeye, and the Mafia***

Brittney Inman

Prof. Judith Ortiz Cofer, Department of English, University of Georgia

Last semester, Fall 2006, I was privileged to participate in Dr. Judith Ortiz Cofer's intensive creative writing course, which sanded my writing into a raw, original shape. Under her expert guidance, I wrote a variety of creative non-fiction pieces that I am proud to present at the CURO 2007 Symposium. As I wrote each piece, I selected true experiences and true people from my life and entwined and expressed them in an artistic way to capture particular themes, characters, and moments. Thus, writing these works was reminiscent of putting the pieces of a puzzle together; I endeavored to connect various pieces of my life to create meaningful designs. Among these creative non-fiction works is the prose poem, "Living in Fire, Ice, and Cardboard," which is a lyrical montage of experiences, reflecting upon a family's repetitive yet progressive series of moves from state to state, told from a child's perspective. The other works presented are short, creative non-fiction prose pieces, which include: "Hotter'N Hell," a series of three scenes, each told from a different time in a girl's life, exposing her father's extreme disposition and downfall; "Green with a Cowboy Print," a depiction of a mother-daughter relationship from a teenage girl's perspective; and "Thanksgiving with the Pope, Popeye, and the Mafia," a characterization of a grandfather's rich personality through a Thanksgiving setting. My hope is that these glimpses of meaning, crafted from life's clutter will evoke a feeling or change within the reader, whether it is subtle, nameless, or ephemeral.

**The Who, What, Where and Why of Georgia's 2006 Agriculture Commissioners Race: An In-depth Look at the Reasons for Tommy Irvin's Landslide Victory over Gary Black**

Jennifer S. Ivey

Dr. Charles Bullock, Department of Political Science, University of Georgia

Georgia's political landscape has changed. Beginning many years ago with Republican Senator Mack Mattingly's defeat of Democratic Senator Herman Talmadge and culminating in the election of a Republican General Assembly, as well as a two-term Republican Governor, elections at most levels in Georgia have become competitive for both parties. Because of this, connected Republicans across the state assured the media that this was the year a Republican was finally going to take the office of the Agriculture Commissioner. However, election night came and delivered the Republican challenger, Gary Black, exactly 321,476 fewer votes than Tommy Irvin. The purpose of this study is to understand why Irvin was so successful in his defeat of Gary Black. Irvin's past victories will be analyzed, county by county, and compared to the counties in which Black was victorious. In addition, a comparison of the candidates' media shares will be made. A least squares regression model will be used to control for the relative Republicanism in Georgia, differences in North and South Georgia, as well as the Urban, Suburban, and Rural area differences. The results from this study can help political scientists understand what areas of Georgia have become more Republican, and those areas which are remaining staunchly Democratic. Furthermore, while other state-wide races in Georgia have been analyzed by political scientists, the Agriculture Commissioner's race is a topic that has received no attention among researchers.

**Genetic and Environmental Effects on Aggressive Behavior in *Drosophila***

Jae W. Jeon, Daniel Alvarez, Jarrad Barber  
Dr. Wyatt Anderson and Dr. Yong-Kyu Kim,  
Department of Genetics, University of Georgia

Aggression is a familiar behavior expressed by different animals, including humans. The causes of aggression are, however, not well known. We investigated the environmental and genetic effects on the formation of *Drosophila melanogaster* aggressive behavior. To test the prediction that male fly aggression is influenced by the environment and genetic make-up, we utilized two types of flies, wild type and mutant type. We also raised them in two ways, in social isolation and in group, to determine how these two factors interact on the aggression in *Drosophila*. We observed six aggressive behaviors - fencing, lunging, boxing, wing threat, holding, and chasing. The aggressive index was measured using a total amount of these behaviors and statistically analyzed using the ANOVA. Our data showed that wild types were more aggressive than mutant flies; and isolated males tend to be more aggressive than communally raised ones. We also found a sexual dimorphism in aggression: males are more aggressive than females in wild types but not in mutant types. These results confirmed that both genetic and environmental factors played important roles in the formation of aggressive behavior in *Drosophila*. This study will be useful for better understanding of human aggressive behavior. Several studies report that genes such as MAOA are involved in aggression, and maltreatment significantly increased aggression in the childhood and adolescent stages. We intend to look at the association between aggressive behavior and brain development in *Drosophila*.

## **Screening of Fosmid Library of Environmental Genomic DNA from Sapelo Island**

Heather E. Johnson

Dr. James Hollibaugh, Department of Marine Sciences, University of Georgia

The purpose of this project was to explore the metagenome of the microbial community at Dean Creek, Sapelo Island, Georgia. A metagenomic library was constructed by splicing randomly selected pieces of DNA extracted from the microbial assemblage and inserting them into a plasmid hosted in *E. coli*. The library was screened, targeting 16S rRNA, bacterial and archaeal ammonia monooxygenase (amoA), proteorhodopsin, arsenate reductase, Rubisco, and ATP citrate-lyase genes. Successful amplifications indicating the presence of the gene of interest were identified using agarose gel electrophoresis or denaturing gradient gel electrophoresis. Draft sequences were obtained from PCR products and compared to published sequences. The presence of the 16S rRNA genes in fosmids allowed us to identify four clones that were derived from Actinobacteria, three from gamma Proteobacteria, and one from alpha Proteobacteria. One clone out of the 5,280 screened appeared to contain an arsenate reductase gene and one contained a Rubisco gene. None of the other targeted genes that were screened for were found in the fosmid library. Fosmids containing genes of interest were sent to the Broad Institute for complete sequencing. The full sequences from the fosmids may reveal novel genes from this community. They will also allow us to associate single genes with taxonomic markers providing an understanding of functional diversity.

### **DNA Recognition by a Novel Recombinase**

Joseph P. Johnson, CURO SCHOLAR  
Dr. Anna Karls, Department of Microbiology, University of Georgia

IS492 is an insertion sequence found in the marine bacterium *Pseudoalteromonas atlantica*. IS492 is inserted into the *P. atlantica* chromosome in at least five locations. Insertion

and excision of IS492 from one of the locations, a putative glucosyl transferase gene, controls the production of extracellular polysaccharide (EPS). EPS is important for the biofilm formation ability of *P. atlantica*. The transposase, MooV, catalyzes the movement of IS492. In order to catalyze the excision of IS492 and its subsequent insertion, MooV must first bind site-specifically to the ends of the IS element before introducing nicks into the DNA. The goal of this project is to characterize MooV DNA binding activity using in vivo assays. Our current approach is to measure in vivo MooV binding to the junction of the ends of IS492 that is formed when IS492 excises from host DNA to give a circular intermediate; this junction sequence was previously shown to be a very strong promoter. Using a plasmid construct with the junction sequence inserted upstream of a promoterless lacZ gene, MooV binding to the element ends is detected as repression of lacZ expression (measured by beta-galactosidase assays). Interestingly, results at this juncture suggest that cleavage-defective MooV variants bind and repress the junction promoter more effectively than wild-type MooV. Further experiments are in progress to determine whether the level of MooV expression or catalytic activity of the recombinase affects the occupancy of the promoter sequence within the circle junction.

### **A Biotechnological Approach to Restoration of American Chestnut (*Castanea dentata*): Mass Propagation via Somatic Embryogenesis**

Sara B. Johnson  
Dr. Scott Merkle, Department of Forestry Research, University of Georgia

The American chestnut was one of the most important forest trees in the Appalachian Forest until the introduction of the chestnut blight fungus, which caused the death of virtually every mature American chestnut tree in the eastern United States. A system for mass propagation of blight-resistant material obtained through conventional breeding or gene transfer is still lacking. Thus, the goal of our project is to

develop a high-frequency *in vitro* propagation system for American chestnut via somatic embryogenesis, a process by which thousands of structures (“somatic embryos”) resembling the embryos in seeds can be produced and germinated to form seedling-like plantlets. Two bottlenecks in this approach are the low initiation rate (<1%) of embryogenic cultures and the production of plantlets from the somatic embryos. To increase embryogenic culture initiation, we tested two plant growth regulators (2,4-D and picloram) at different concentrations and found that 2,4-D resulted in the highest frequency of embryogenesis (up to 3.5 %). To increase plantlet production, we tested variations in cold (4° C) treatment duration (12, 15, and 18 weeks) and light quality (red, red + far red, and cool white fluorescent). For some genotypes, the longer cold treatments improved plantlet production and red light improved overall plantlet production frequency (up to 80% and 69%, respectively). Thus, by manipulating the cultural treatments, we were able to increase culture initiation frequency and plantlet production efficiency. These production methods will aid in the restoration of the American chestnut in our forests.

### **Early Childhood Education and Family Literacy in Athens**

Jimari L. Jones, Jeremy Atkins – ROOSEVELT @ UGA  
 Dr Elizabeth DeBray-Pelot, Department of Lifelong Education, Administration & Policy, University of Georgia

Athens, Georgia, has one of the nation’s highest poverty rates. At roughly 28%, Athens has a poverty rate twice that of the state. Poverty is a humiliating phenomenon that binds and constrains families, creating communities of devastation and concentrations of despair. As a result, impoverished families are hindered from fulfilling the promises and dreams that have come to epitomize America. Therefore, we have developed a comprehensive bi-generational policy designed to combat the ill effects of poverty. Our policy initiative provides for an Athens-Clarke County-wide universal preschool

program to positively impact the early childhood development among children of low-income families in the community. To complement this early-childhood initiative, an adult program would be established, empowering parents to sustain employment and create and maintain healthy learning environments at home in practical ways. It addresses the basic educational needs of low-income parents and children up to age eight by providing a unified program of: (1) adult basic or secondary education and literacy programs for parents, (2) assistance for parents to effectively promote their children’s educational development, and (3) early childhood education for children. Our hope is to inspire and motivate children before even beginning elementary school. Secondly, by providing adult and family literacy, this ensures the children have the positive reinforcement necessary from parents that spurs interest and a healthy passion for an education.

### ***Intersections***

Kerry Jones  
 Prof. Andrea Trombetta, Department of Fabric Design, University of Georgia



These three garments serve as these three women’s uniforms. They are extensions of themselves, they are explanations of themselves. Each garment was created specifically for each hand-picked woman, and fitted to her body. Exaggerated hips on the pant, the short and the skirt emphasize the importance contemporary America places on both body image and fertility. This piece relies on the investigation of discomfort within society due in part to

changing, as well as ever-present, gender roles and the impossibility of avoiding judgment throughout our lives. Photographs of steel parts in repetitive positions are the subject of the imagery, though abstracted. Grey cotton was screen-printed with these images using various shades of grey pigment. This dulled palette provides a somewhat blank, though still visually stimulating, canvas for the added details to express the personality of each individual piece and of each individual wearer. The women used as models resemble each other greatly, adding to the feeling of a blank canvas waiting to be dug into. Every garment has accents of red, orange or yellow; the colors of fire. These accents represent the inner audacity stifled by society's desire for the grey exterior; the audacity bubbling right beneath the surface of the women adorned with the pieces. The women are literally bound in a space by VHS tape, creating a visual representation of their tension due to inequality, expectations, abnormality, psychoses, whatever each woman feels, whatever any human being feels.

### **Sampling Ambient Air to Test for Polycyclic Aromatic Hydrocarbons**

Kunal N. Kanani

Dr. Geoff Smith, Department of Chemistry,  
University of Georgia

The air in Athens, GA was sampled and tested for the presence and the amount of Polycyclic Aromatic Hydrocarbons (PAHs) over a period of one year. Polycyclic Aromatic Hydrocarbons (PAHs) occur widely in the environment as a result of incomplete combustion of fossil fuels and other inorganic matter. The major source of PAHs in the atmosphere are burning of wood, coal, automobiles and heat and power plants. The Environmental Protection Agency (EPA) has classified 16 PAHs as potent human carcinogens. Some of them include anthracene, benz[a]anthracene, benzo[ghi]perylene, benzo[a]pyrene, pyrene, benzo[k]fluoranthene, chrysene, and fluorine. These PAHs induce genotoxic and chronic effects in humans. It was predicted to detect the 16 EPA classified PAHs by using similar methods that have been used in

the past by other researchers. Ambient air was sampled using a glass fiber filter paper attached to a pump. Then, the sample was extracted and a suitable technique for extraction was determined. Ultrasonic bath using methylenechloride as solvent was found to be an efficient technique for extraction. The different analytical methods used to detect PAHs were HPLC (high-performance liquid chromatography), GC (gas chromatography) and quadrupole mass spectrometry. The results obtained from the HPLC/GC were inconclusive because PAHs were found to be below detection limit of the HPLC/GC but a suitable result was obtained from the mass spectrometer with identification of some PAHs like fluoranthene, pyrene and other particles in the atmosphere like alpha pinene ozonolysis products. Furthermore, this paper reports the problems encountered, such as obtaining efficient extraction of the PAHs from the filter paper, lowering the detection limits of the analytical methods and measuring PAH concentrations quantitatively.

### **The Role of Extremism in the Arab-Israeli Conflict**

Samantha E. Keyes-Blumer

Dr. Christopher Allen, Department of  
International Affairs, University of Georgia

Recent literature aside, diverse peoples have actually flourished together in the Middle East for hundreds of years. Under the benign neglect of the Ottomans, various cultures coexisted and even assimilated into a relatively cohesive Middle Eastern culture. Why then, have the peoples of the Middle East been caught up in an increasingly violent and intractable conflict? One explanation offered by scholars is the growth of extremism. Popular commentators, policy wonks, and serious scholars alike label everything from Iraq's civil war to peaceful student protests as "extremism" and "fundamentalism." A plethora of terminology with vastly different meanings has been co-opted in an attempt to understand the complex civil and communal conflicts of the Middle East. This presentation will attempt to unpack and differentiate among these terms. It will offer

precise definitions and focus specifically upon action as extremism: the committing of a violent, unprovoked act, as opposed to simply the threat of violence. Next, the presentation will examine various actions and events, which meet the definition of extremism, to see if they share characteristics that explain the pattern of punctuated, violent episodes that have occurred throughout the last century. For example, a pattern of violent Arab revolts might share the characteristic of being preceded by illegal land confiscations. Extremism in Israeli, Palestinian, and/or the Arab governments and citizenry will be explored: Is extremism entrenched in the actions of the Israelis, the Arabs, both, or none at all? Finally, policy proposals for possible solutions to the Arab-Israeli conflict will be suggested.

#### **Diagnostic Assay for *Mycoplasma bovis* Using Immunohistochemistry**

John R. Killey

Dr. Corrie Brown, Department of Veterinary Pathology, University of Georgia

*Mycoplasma bovis* is an important cause of pneumonia in cattle. Treatment of diseases resulting from *M. bovis* usually proves very difficult because *Mycoplasma* species lack cell walls, which separates them from most bacteria, and thus renders them invulnerable to many of the main categories of antibiotics. The first step in a successful treatment for *M. bovis* begins with an accurate and reliable diagnosis. The purpose of this experiment is to develop a diagnostic assay for *M. bovis* using immunohistochemistry (IHC). Using a monoclonal antibody specific for *M. bovis*, followed by application of avidin-biotin complexes (ABC) and enzyme substrates, the bacteria were effectively localized within lung tissue harvested from cattle suspected of having the disease. By honing the sensitivity and specificity of the IHC method used, the University of Georgia College of Veterinary Medicine's diagnostic laboratory hopefully will be able to improve its reliability and accuracy in making diagnoses on clinical specimens submitted for analysis. As a result, treating

diseases which result from infection with *M. bovis*, such as pneumonia, will become easier and more effective.

#### **The Influence of Muscle Length on Muscle Oxygen Saturation**

Aaron K. McPherson

Dr. Kevin McCully, Department of Kinesiology, University of Georgia

(*J. Michelle King, Aaron K. McPherson, Christopher P. Elder, Christopher D. Black, Kevin K. McCully*)

Previous studies have suggested that chronic stretching might be able to produce an increase in the size of skeletal muscle. However, stretching might also result in restricted blood flow which might influence any stretch-training program. This study evaluated the influence of muscle position (shortened, neutral, and stretched) on muscle oxygen saturation using near infrared spectroscopy (NIRS). An 8 channel NIRS probe was placed on the calf muscles of 5 healthy adults. Measurements were made over 30 minutes in the three positions with the subjects performing 5 second maximal contractions once every minute. Oxygen saturation values were normalized with the maximum and minimum levels of oxygen saturation recorded. Oxygen saturation before (rest) and during the different conditions were measured and confirms that the stretched position significantly lowered oxygen saturation relative to the other conditions. Stretching either passively or with contractions decreased oxygen saturation, such that stretch training may also have a significant hypoxic component. A stretch-training program will have other components that will influence the development of muscle because other studies have shown that a decrease of oxygen within the muscle can also enhance muscle growth.

### **Tracking Continent-wide Parasite Spread in Monarch Butterflies: Launching a New Citizen Science Project, MonarchHealth**

Natalie D. Kolleda

Dr. Sonia Altizer, Institute of Ecology,  
University of Georgia

Monarch butterflies (*Danaus plexippus*) are iconic insects that occur worldwide and are best known for undertaking a spectacular annual migration in parts of N. America. The protozoan parasite, *Ophryocystis elektroscirrha* (*OE*), infects all monarch populations examined to date and prevalence varies inversely with host migratory distances, with highest prevalence in populations that breed year round and do not migrate. To better understand how migration influences variation in parasite prevalence over space and time, in spring 2006 we launched a new citizen science monitoring project, MonarchHealth. We predicted that volunteer-collected samples across North America would show increasing prevalence of *OE* throughout the breeding season following transmission from adults to larvae. We further predicted that prevalence would be lowest among monarchs sampled at the extreme northern limits of their breeding range. After publicizing this project through environmental outreach programs, we recruited nearly 100 volunteers from across the U.S. and Canada. We developed a kit for volunteers to obtain samples from wild-caught monarchs; samples were returned to our laboratory at UGA and examined a microscope to check for the presence of *OE* spores. Results showed that about 12% of monarch butterflies were infected with *OE* during the 2006 breeding season, and that parasite prevalence increased toward the end of the breeding season, as we had originally predicted. This project enabled us to involve the public in collecting scientifically useful data at a continent-wide scale, with broader implications for understanding how monarch migratory behavior – currently classified as a “threatened phenomenon” – influences parasite infection patterns.

### **Synthesis and Photochemistry of 8-Cyano-7-hydroxyquinoline (CHQ): A Photolabile Protecting Group with a High Photochemical Quantum Efficiency for Biological Use**

Christopher H. Kragor

Dr. Timothy Dore, Department of Chemistry,  
University of Georgia

8-Bromo-7-hydroxyquinoline (BHQ) is a photolabile protecting group for carboxylic acids, phosphates, diols, and phenols, which are commonly encountered functional groups in bioactive molecules such as neurotransmitters, DNA, RNA, messengers, and drugs. BHQ is stable in the dark under physiological conditions, and upon one- (1PE) or two-photon excitation (2PE); it releases the bioactive molecule in its active form. 2PE enables the tight 3-dimensional spatial release of the protected group. The light-triggered release of bioactive molecules is important because it enables many applications in research and medicine, such as the controlled inhibition of protein synthesis or the delivery and activation of drugs. Additionally, it will help further our understanding of the action of neurotransmitters and other biological messengers. An 8-cyano derivative of BHQ was successfully synthesized, 8-cyano-7-hydroxyquinoline (CHQ). The synthesis involved addition of dichlorocarbene to the C-8 position of quinaldine to generate an aldehyde, which was converted to an oxime. Dehydration provided the nitrile. The cyano group, which does not promote intersystem crossing (ISC) to the triplet excited state, like bromine does, improved the light sensitivity of CHQ. ISC competes with photochemical processes, lowering the quantum efficiency of carboxylate release. CHQ shows increased absorptivity when compared to BHQ, but the quantum efficiency is similar because of increased levels of fluorescence, which competes with the photochemistry. CHQ demonstrated a lower 2PE cross-section than BHQ, which might be explained by the increase in fluorescence.

### **Healthcare Coverage among Latinos in an Emerging-Gateway Southern State**

Joseph T. Lariscy – CURO SCHOLAR  
Dr. Leigh Willis, Department of Sociology,  
University of Georgia

This study examines the disparity in healthcare coverage between Georgia's new Latino population and the state's non-Latino, white residents. Between 1990 and 2000, the Latino population in Georgia tripled (Census Bureau 1990 and 2000). This influx to Georgia, and several other southern states, was a result of a growing demand for low-wage, unskilled workers in local economies. Georgia's healthcare system had to respond to the rapid arrival of a population that possessed a language and culture different from that of the mainstream native-born residents and lacked familiarity with Georgia's healthcare policies. This lack of knowledge of the medical practices of the dominant culture may impair the ability of Latino immigrants to obtain health insurance for themselves and their families. Analyses are based on the 2005 Behavioral Risk Factor Surveillance System (BRFSS), collected by the Centers for Disease Control and Prevention. Logistic regression was performed to show the effect of various demographic factors, including race/ethnicity, age, education, and income, on likelihood of possessing health insurance. The results show that, in Georgia, non-Latino whites are more likely to have health insurance than are members of the state's increasing Latino population. This conclusion suggests that in emerging-gateway southern states, Latinos may be assimilating into the underclass, where adequate healthcare is difficult to obtain. The research is important because it may assist Georgia's healthcare professionals as they work to solve the state's healthcare disparities.

### **Functional Analysis of the *Magnaporthe grisea* Secretome**

Brian T. Laughlin  
Dr. Alan Darvill, Departments of Biochemistry  
& Molecular Biology, Plant Pathology,  
University of Georgia

*Magnaporthe grisea* is the causal fungal agent of rice blast disease responsible for the annual loss of 200 million tons of rice output worldwide. Under various growth conditions, *M. grisea* secretes a large number of extracellular proteins (ECPs) presumably required for growth, development, pathogenicity, maceration of host cell walls, and molecular signaling. Many ECPs have been identified, but their exact biological functions remain to be determined. Among these extracellular proteins, two *M. grisea* ECPs, MgEcp22 and MgEcp23, are exclusively secreted during infection of the plant host, thus may be pathogenicity factors or signal-molecules involved in the regulation of interactions between the fungal pathogen and plant host. To better understand the roles of MgEcp22 and MgEcp23, *M. grisea* expression systems capable of over-expressing the ECPs are being developed. Initially the traditional, though laborious, restriction-ligation technique was used to clone *MgEcp22* and *MgEcp23* into an expression vector. In an effort to reduce labor, I also tested, though not yet successfully, a high-throughput technique to clone the ECP genes using the yeast gap-repairing protocol, which takes advantage of the high rate of homologous recombination in yeast. One finished expression construct, pWH102, which carries the *MgEcp22* gene, has been transformed into *M. grisea*, and the over-expression of the MgEcp22 is being examined using antibodies against epitope tags fused to the ECP. The probable formation of protein complexes between MgEcp22 and a host protein or proteins during infection will also be investigated. Such complexes, if purified, may then be characterized using current proteomics technology.

### ***Soldier Series Fall 2006***

Chandler Leathers

Prof. Michael Marshall and Prof. Stephen Scheer, Department of Photography, University of Georgia



The images are photographed using a 4x5 toyofield camera. I have been photographing UGA's Army ROTC members since the Spring of 2006 in an effort to put a face on our armed services. I feel that too often with media coverage that we forget that the UNITS and branches often casually discussed contain individuals who have chosen to put their lives on the line for causes sometimes that are not seen as black and white. Also, these individuals are not just in a day-to-day job; it is a lifestyle that requires a 24-hour commitment, whether to training or to picking up roots at the drop of a hat. I realize that it is a personal choice and there are a lot of benefits, but there are only a select few who have the discipline and will power to do the things they do.

### **The English-only Movement: A Critical Analysis through Comparative Study of French Language Regulation**

Brian Levy – CURO SUMMER RESEARCH FELLOW, CURO SCHOLAR

Dr. Larry Nackerud, School of Social Work, University of Georgia

Within the increasingly polarized American political debate on immigration, the English-only movement continues to gain prominence. Recently, the US Senate passed two language bills, declaring English the common, official, and unifying language of America. These regulatory acts come as the Hispanic population within the United States continues to burgeon—approximated at 14.1 percent in 2004. Governmental regulation of language is not a phenomenon unique to America. France, Spain, and other worldwide nations have also undergone varying degrees of language management. The first part of this paper is an ethnographic case study that utilizes France as a model for potential American language regulation. France offers the most promising source of exploration due to its long regulatory tradition, as well as strong national culture. To effectively examine the nature and consequences of French lexicon management, a phenomenological-explanation model—with semi-structured interviews of linguists, media workers, and a French Culture Ministry Official being the primary method of data gathering—was used. The rationale, structure, and effects of French regulations are highlighted. The second half of the study is a policy analysis that employs this data to argue against the feasibility of language regulation in the United States. National and multinational cultural implications are also underscored.

### **A Field Guide to English/Spanish Medical Translation**

Robert B. Lindell

Dr. David S. Williams, Honors Program, University of Georgia

Given the steady increase in the Hispanic population in the US, the need for Spanish-

speaking medical professionals is growing. In light of the current lack of bilingual physicians, our healthcare system relies on medical translators to bridge the language gap that hinders patient care. However, due to sheer patient volume and the economic burden of highly-skilled, full-time translators, hospitals are struggling to effectively treat Hispanic patients. In response to this current limitation of our medical system, I authored *A Field Guide to English/Spanish Medical Translation*. This forty-page booklet is designed as an active reference for physicians and volunteers with limited exposure to Spanish. Organized by body systems and organs, the booklet emphasizes technical vocabulary, important verbs, and practical diagnostic questions for each section. After nearly six months in Peru and Spain studying medical Spanish, the challenge of authoring this guide was to identify the terminology essential to patient care. Drawing on my own clinical experiences, I have included only vocabulary with direct clinical significance. Technical jargon has been discarded in favor of accessible layman's terms. In all possible cases, I have selected widely accepted medical terms, minimizing the effect of regional language variations. Though many exhaustive guides to medical Spanish exist, this booklet is unique for its incredibly brief and highly targeted treatment of the entire body of medical Spanish. Due to its unique approach, this booklet has the potential to achieve widespread acceptance and impact the quality and nature of medical care for the Hispanic population.

### **The Effect of Cognitively Challenging Talk on Oral Language Development in Low-income Preschool Children**

Christopher MacLean

Dr. Paula Schwanenflugel, Department of Educational Psychology, University of Georgia

Preschool children growing up in poverty have fewer opportunities to practice complex language skills. These students begin kindergarten academically disadvantaged because language development is closely tied to early literacy and later school achievement. To

learn how to enhance verbal ability within this population, a ten-week intervention was employed throughout multiple lottery-funded preschools serving low-income communities in Northeast-Georgia. Experimenters met twice a week with pairs of students to complete 500 minutes of Cognitively Challenging Conversation. Results were compared with a control group matched on EVT scores that did not partake in the intervention. Various techniques were used to elaborate on child speech including imitation, extension, expansion, recast, repetition, clarification and open-ended questions. Pre- and posttest language sampling included the use of guided conversation, speech stems and the narration of a word-less picture book. Mean Length of Utterance (MLU) was used as a measure of oral language ability. Relationships between Cognitively Challenging Conversation, MLU, academic learning and early literacy are discussed.

### **Under the Rug Swept: Rural Punjab Women in the Ecotone of Urbanization**

Aqsa Mahmud

Dr. Fausto Sarmiento, Department of Geography, University of Georgia

The case study examines urban expansion in traditionally agricultural areas of Pakistan and its effects on the functions of rural Punjab women. Expansion of industrial activity into peripheral areas of Pakistan's Punjab creates a buffering zone which resides between two economically different regions. This mediating area features an inter-mixed economy, in a continuum inclusive of traditional farming practices and industrial employment. Hitherto, rural Punjab women exist as an invisible factor to family income, functioning in domestic roles and as farming aides. This role is changing with the introduction of inner-city norms and an industrial climate. Industrial expansion promotes alternate economic opportunities for women and urban growth increases awareness in health and education sectors. Data collected through house call surveys shows female participation primarily in the informal economy. Industrial

presence and the growth of urban housing offers work options for women and allows for multiple income-earners within a household. Interviews with health personnel stress the importance of women's role in health education of rural areas. Women are the primary patients at Basic Health Unit facilities and are important in community awareness campaigns. As more schools open in the area, effort is exhibited to obtain formal education for both genders and provide female teachers, one of the few formal economic activities with female participation. This study concludes the alteration of gender-role activities among rural Punjab women as a reaction to urban expansion; the Punjab women case study can also be applied to better understand the dynamics of farmscape transformation in peripheral regions of developing countries.

### **Expression and Renaturation of Recombinant HL-1, a Lectin-like Protein That May Function as a Type II Diabetes Therapeutic**

Anant Mandawat & Bradley Allen

Dr. Michael Pierce, Department of Biochemistry & Molecular Biology, University of Georgia

Recent studies have found that human lectin-1 (HL-1, omentin, intelectin) is a secretory protein released from adipose tissue. It has been reported to function as an adipokine that when used in conjunction with insulin, improves glucose uptake in adipocytes. In addition to its previously theorized immune function, the adipokine results may link HL-1 to a function in type II diabetes. Our research hopes to elucidate the role or roles of HL-1 via its expression in bacteria and analysis. The HL-1 DNA sequence with an added 6-His tag was cloned into a pET vector using restriction enzyme sites. The vector was then transformed into BL-21 cells, and the HL-1 insert was expressed using IPTG induction. The BL-21 cell components were retrieved and stained for HL-1. After several washes to isolate the protein, the sample was subjected to refolding to solubilize the protein. The presence of isolated HL-1 was confirmed using Commassie staining and Western blotting. Purified HL-1 will be used with radiolabeled glucose to assay glucose uptake in adipocytes. If

successful, HL-1 would be an important treatment to combat insulin resistance, the cause of type II diabetes. In addition, experiments on a carbohydrate microarray will be performed on the lectin to determine its binding specificity. The binding specificity will provide clues to the immune function of HL-1 as well as its mechanism of action in adipose tissue.

### ***Gone but not – Making Dance through Improvisation***

Mary Mattmann

Prof. Rebecca Enghausser, Department of Dance, University of Georgia

*(Laura Burgamy, Leah Chapman, Marie Danielle Clark, Emily Crate, Caitlin Cunningham, Leslie Gibson, Cara O'Grady)*

*Gone but not* is a study in using words rather than music to develop movement vocabulary. The poetry, by Pablo Neruda, was used to create an atmosphere as well as a theme for the movement, which is the desire by the human race to leave a trace and not be forgotten by the world when they have left it. The goal of the work is to create an emotional reaction to the theme as well as create a connection between the audience and dancers, who use both their voice and their bodies to communicate the theme. The piece uses modern and contemporary movement vocabulary that was developed both as a direct response to the words of the poem as well as an indirect response to the literary theme of the piece. Although much of the choreography is set, the dancers have the freedom in many areas to improvise their movement, creating a more genuine representation of the theme from each dancer. The dancers were also given verses of the poem and created their own movement in response to those excerpts, which was later set as part of the choreography. The ability of the dancers to self-determine much of the piece was a critical part of the creation of this work. Each performer draws upon her own dreams, goals, and desires, and in order to communicate that idea, in hopes that the individual voices of the dancers shines through. This universal notion could be portrayed in movement in a number of

ways; communicating this idea serves as our central inspiration.

### **Models of Diversity**

Dakia McCray – CURO APPRENTICE

Dr. Victoria Plaut, Department of Psychology,  
University of Georgia

To address the problem of interracial and intergroup tension, scholars have made efforts to promote different ideologies. The major of these are multiculturalism and colorblindness.

Colorblindness says that people of varying races/ethnicities hold essential similarities and should therefore be treated as individuals rather than identified with a social group. This position often leads to pressure to assimilate as well as loss of cultural identity. Multiculturalism, as it is generally understood, is the advocacy of a society that is inclusive of distinctive cultural groups equal in status. Previous research has examined the prevalence of these two models and their popularity among majority and minority groups (Plaut and Markus, 2005). In the current research we are interested in how these models of diversity relate to social status. In one experiment, we exposed participants to either multiculturalist or colorblind ideologies in addition to a control group. After the experimental manipulation, participants completed two dependent measures: the Social Dominance Orientation (SDO) scale and a resource allocation task that assessed their willingness to support diversity-related organizations. We found that these ideologies did indeed affect attempts to preserve status. In a second experiment, we exposed participants to two different status levels. These levels were represented by a CEO and a bank teller. Following the manipulation, the participants completed two measures of diversity attitude in the workplace. Through this experiment, we are looking to see whether status influences people's attitudes toward diversity. We will seek to find a way that these models can minimize threat and decrease intercultural conflict and hostility.

### **Determining Cost of Medical Sharps Disposal at a Local Health Center in Uganda**

Andrew C. McKown

Dr. Robert T. Chen, Centers for Disease Control & Prevention

In the recent decades, single-use disposable syringes have replaced sterilizable syringes in health care settings in order to curb disease transmission through reuse of sharps. However, the consequent generation of infectious medical sharps waste also poses health risks if the waste is not properly contained. In resource-scarce developing countries, health systems often under-budget for health care waste disposal because of lack of knowledge of expenses, necessitating an easy tool by which to measure and plan for actual disposal costs of medical sharps. This study field-tested a preliminary spreadsheet tool for costing of medical sharps disposal in developing countries, including all labor, capital, and operating expenses. Over a six-week period all medical sharps were inventoried and tracked through usage and disposal at a rural health center in eastern Uganda, during which time the health center changed from simple open pit burning of waste to encapsulation of sharps waste. The cost of disposal via open pit burning and encapsulation were measured at US\$0.027 and US\$0.029 per syringe, respectively. The cost of the introduction of a more appropriate system of medical waste pits was also estimated, at US\$0.036 per syringe. The study experience demonstrates that proper budgeting for waste disposal is feasible because the cost of disposal is measurable with a simple tool. Furthermore, the measured costs of sharps disposal approach the purchase price of syringes, thus confirming the importance of budgeting for sharps disposal. The spreadsheet tool is being developed for widespread use in the future.

### **The Path Less Taken: A Progressive Approach to Stem Cell Extraction and Grading**

William Colter McWhorter & Naseem Esteghamat – ROOSEVELT @ UGA  
Dr. J. David Puett, Department of Biochemistry & Molecular Biology, University of Georgia

Human embryonic stem cell (hESC) research has ascended to the forefront of national controversy in the past decade. Despite further research and developments in other stem cell sources, hESC research is still the most effective method for deriving stem cell lines and potential disease treatments. An alternative method, which may appeal to those traditionally against hESC research, must be considered by the U.S. Congress. This method promotes utilizing nonviable embryos generated by in-vitro fertilization (IVF) clinics that would normally be discarded because of their low potential for developing into a fetus and likelihood of endangering the mother. Although unfit for implantation, these embryos would be ideal for research and generation of stem cell lines. As a preliminary step in supporting this method, the federal government must support developing a nationally recognized and federally regulated method for grading IVF-generated embryos in order to assuage political doubts and foster basic medical and scientific research developments. Federal scoring of embryos, through statistically-based biological aspects such as cleavage abnormality, structural inconsistency, and time frozen, along with federal oversight and funding would provide a solid foundation for hESC research. Under the supervision of the National Institutes of Health, unfit embryos would be transported from IVF clinics and passed to researchers. Derived embryos would require written consent through the IVF donor couple. Implementing these policies at the clinical level is essential to show the real value of alternative derivation. It will be a key measure on the road to full government support of hESC applications.

### **Egyptian Life, As Represented in *Adrift on the Nile* and *Zaat***

Yael Miller  
Dr. Sherry Lowrance, Department of International Affairs, University of Georgia

The period of Nasser and Sadat in Egyptian history is a complex and fascinating time. Novels, plays, and non-fiction work abound concerning the era, as writers attempt to signify the importance of nationalism and modernization during the time. Sonallah Ibrahim and Naguib Mahfouz, in respective novels, tell the story of different sectors of society during the period. Two novels were analyzed in order to develop theories regarding Egyptian life during the period, while taking into account historical background. While Ibrahim attempts to convey the struggle of the “common” Egyptian woman during the Nasser, Sadat, and Mubarek’s reigns, Mahfouz writes concerning a group of bourgeois intellectuals during the later years of Nasser. Nationalism, economic reform, and the status of various groups in Egyptian society at the time all influenced the lives of Egyptians. Class relations and Egyptian politics are both subjects of Sonallah Ibrahim’s *Zaat* and Naguib Mahfouz’s *Adrift on the Nile*. Egypt’s political situation in both novels shows the process of change, with Mahfouz beginning with the time of Nasser and Ibrahim concentrating more on Sadat. Ibrahim specifically underscores the suffering and the isolation of the middle and lower class Egyptians, while Mahfouz demonstrates the boredom and eventual downfall of the upper class. In both novels, class interaction is close to nonexistent, and while, both novels may not be universal examples of Egyptian life, it is possible to ascertain important information from both regarding Egyptian life and its complexities.

## **US Involvement in the Reconstruction of Lebanon**

Yael Miller – ROOSEVELT @ UGA  
Dr. Sherry Lowrance, Department of  
International Affairs, University of Georgia  
(*Yael Miller, Jonathan Pride – ROOSEVELT @ UGA*)

Once called the “Paris of the Middle East,” Lebanon was known for its tolerance and diversity among its Christian, Muslim, and Druze factions. Its democratic traditions, its widely-publicized “Cedar Revolution,” and its history of diverse tradition stemming from years of foreign rule and intervention, have given Lebanon a unique standing amongst Arab nations. Lebanon has sustained one of the region’s few functioning, though fragile, democracies and the only Arab democracy to date. A secure Lebanon would provide the United States a solid, moderate ally, in a region where the United States needs another. Lebanon’s recent conflict with Israel has highlighted weaknesses in the Lebanese government; Hezbollah poses a serious threat to the Lebanese government’s sovereignty. In order to determine a course of action regarding US involvement in the reconstruction of the state, data were gathered concerning Lebanese history, historical records of other conflicts where the US has supported reconstruction efforts, and other positive, economy-building initiatives in other war-torn areas. A public works program supported by US aid will enforce a collective civil identity and promote community in war-damaged regions and throughout Lebanon; furthermore, those who once turned to militias for financial and community support will find new opportunities in the public works system. In addition, by strengthening the Lebanese military, the country of Lebanon may physically improve the slow process of dismantling all interior militias, including the military wing of Hezbollah, that threaten the very existence of the fragile government. A reconstruction effort beginning with a public works program will provide an innovative start to strengthening Lebanese sovereignty.

## **An Empirical Study of Government and Dissident Interactions in Cambodia and Indonesia, 1980-2005**

Maggie Mills – CURO APPRENTICE & CURO  
SUMMER RESEARCH FELLOW  
Dr. Stephen Shellman, Department of  
International Affairs, University of Georgia

There is an abundance of literature which deals with the way governments react to the dissident groups within their borders. However, the majority of this material analyzes the relationship quantifiably through the two variables of government and dissidents in a two-actor model. The literature fails to take into account the fact that multiple dissident groups have different goals, ideologies, and behave in different manners, and they should not be analyzed as a single actor or coalition of groups, especially if a coalition fails to exist. My research will act as a case study using the results from a conference paper on disaggregating dissident groups I have worked on with Dr. Shellman. My research will take into account the number of dissident groups and will analyze the relationships between the government and the groups through a multivariate vector autoregression test, as well as through the difference of means test. These tests will show whether a dissident group’s actions are dependent upon different types of cooperation and repression coming from the government, as well as the success or failure of tactics used by other dissident groups. To perform these tests I will use the Project Civil Strife data for Cambodia and Indonesia. In the future, this project will include other countries in order to validate the results coming from Cambodia and Indonesia or show how situations and the dynamics of different countries affect these interactions. Eventually I would like to look at my results and deduce whether certain governmental actions deter more action from dissident groups than other policies and actions; these conclusions can provide me with the information I would need to make viable policy prescriptions based upon my research.

**Differential Modulation of Anxiety-like Behavior in Syrian Hamsters by Endocannabinoids and Benzodiazepines**

Anna M. Moise – CURO SUMMER RESEARCH FELLOW

Dr. Andrea G. Hohmann, Department of Psychology, University of Georgia

We tested the hypothesis that endogenous cannabinoids would suppress anxiety-like behavior in Syrian hamsters through activation of cannabinoid CB<sub>1</sub> receptors. Animals were evaluated in one of two distinct behavioral paradigms – a conventional model of anxiety (the elevated plus maze) or a naturalistic model of social stress (social defeat). Hamsters received an inhibitor of endocannabinoid deactivation (URB597), a cannabinoid CB<sub>1</sub> antagonist (rimonabant), a benzodiazepine anxiolytic (diazepam) or vehicle. Inhibition of endocannabinoid metabolism with URB597 induced a CB<sub>1</sub>-mediated suppression of anxiety in the elevated plus maze. Blockade of CB<sub>1</sub> with rimonabant increased anxiety-like behavior. URB597 and diazepam decreased entries into closed arms of the maze, consistent with anxiolytic effects. By contrast, rimonabant decreased entries into open arms of the maze, consistent with anxiogenic effects. We used a naturalistic model of social anxiety to evaluate the effects of the same pharmacological manipulations on social defeat. Following exposure to a larger dominant hamster, subordinate hamsters display submissive behavior even in the presence of a smaller, nonaggressive hamster. We tested the hypothesis that this conditioned defeat would be suppressed by conventional anxiolytics such as diazepam and inhibitors of endocannabinoid deactivation such as URB597. Diazepam suppressed the expression, but not the acquisition, of conditioned defeat. By contrast, URB597 and rimonabant, administered at doses that modulated anxiety-like behavior in the elevated plus maze, did not alter conditioned defeat. Our data demonstrate that URB597 and diazepam differentially modulate anxiety-like behavior in male Syrian hamsters. Moreover, conditioned

defeat is not dependent upon cannabinoid CB<sub>1</sub> receptor activation.

**Gene Knockout Analysis of Two Putative Xylanase-regulating Transcription Factors in the Rice Blast Fungus**

Lamar H. Moree – CURO SUMMER RESEARCH FELLOW

Dr. Alan Darvill, Departments of Biochemistry & Molecular Biology, Plant Pathology, University of Georgia

Dr. Sheng-Cheng Wu, Complex Carbohydrate Research Center, University of Georgia

*Magnaporthe grisea* is the causal fungal agent of rice blast disease, which is responsible for the annual loss of about 200 million tons of rice output worldwide. Under various growth conditions, *M. grisea* secretes numerous extracellular proteins important for growth, development, pathogenicity, and molecular signaling. Among these proteins are many hydrolytic enzymes that macerate the host plant cell walls. In the industrial fungus *Aspergillus niger*, production of cell wall-degrading enzymes is regulated by a transcription factor, XlnR, which has two homologs in the *M. grisea* genome (*MgXR1* and *MgXR2*). To determine the biological function of *MgXR1* and *MgXR2*, gene knockout analysis was performed on each gene. One  $\Delta mgxr1$  and two  $\Delta mgxr2$  mutants were confirmed by Southern Blot analysis. Both mutants were cultured on minimal media with rice cell walls as the sole carbon source. Mycelia weight, xylanase activity, and RNA transcripts of the cultures were quantified and compared to those of the wild-type strain. On Day 5 post-inoculation, both mutants out-grew the wild-type by 20-30% in terms of fresh fungal mass; however, the mutants secreted only about 5% as much xylanase as the wild-type. Surprisingly, the RNA concentration for each of the six xylanase genes measured appeared to vary from gene to gene and culture time to culture time, ranging from severe reduction to enhancement in expression level. The radial growth of both mutants on monosaccharides, particularly on xylose, exceeded that of the wild-type by over three fold. These results indicate that *MgXR1*

and MgXR2 are functionally similar to XlnR, but neither positively nor directly regulates the transcription of a set of individual xylanase genes.

### **Zeolites of Eastern Uganda and Their Scientific, Social, and Economic Potential**

Mia Catherine Morgan

Dr. William Kisaalita, Department of Biological & Agricultural Engineering, University of Georgia

In an ongoing study at the University of Georgia, the mineral zeolite is being used in the development of a cooling system, which would provide milk cooling for small dairy farmers who do not have access to electricity. The zeolite in the system plays a crucial role in the vacuum adsorption technology used in the cooler. There are over two million farmers in Uganda alone who greatly need this technology, and the discovery of zeolite in Uganda would not only lower the cost of the cooler, making it more affordable, but will also open up possibilities for other applications. Some of these applications include liquid purification and clarification, deodorizers, desiccants, construction materials, etc. The goal of this research is to determine whether rock samples collected during an eight week, on-site research project in Uganda, East Africa, are one of the more than 40 naturally occurring zeolite species. A natural zeolite is a framework aluminosilicate whose structure contains channels filled with water and exchangeable cations. Rocks are currently being tested using Thermogravimetric Analysis (TGA) as well as Nuclear Magnetic Resonance (NMR). Results of these tests will be presented. Also, this research will examine the potential social and economic impact of discovering zeolite in Uganda.

### **African Immigrant Integration in Post-industrial Western Societies**

Yannick Morgan

Dr. Abdulahi Osman, Department of International Affairs, University of Georgia

Immigration issues have recently become especially important since several Western countries have experienced major acts of violence involving their immigrant populations. What are the factors that affect the way African immigrants are integrated into the Western societies of France, the Netherlands, and the United States? Demographic information about the immigrant populations, relevant news reports, and reviews of the national legal, political, and social attitudes about immigration all contribute to the conclusion reached here. That is to say, the factors that arise from this analysis include the following: first, while European majority populations are focused on their growing Muslim populations (much of which originate from African states) due to the recent increased visibility of political Islam, in the United States, the immigrant group more prevalent in the national discourse is the illegal Hispanic population coming from Mexico and Central America. Second, African immigrants to France and the Netherlands include a greater number of individuals with lower incomes than the national average and of Muslim descent, while in the United States, African populations are drawn more from sub-Saharan Africa and represent one of the more wealthy immigrant groups in the States. These factors – social domestic focus and characteristics of incoming immigrants – affect how African immigrants are able to integrate into these western societies. While in the United States, African immigrants are able to integrate more fully, flying under the Nativist radar, whereas in the Western European countries of France and the Netherlands African populations have had greater difficulty integrating into the majority populations.

### **Evaluation of Direct Plating Methods to Enumerate *Alicyclobacillus* in Beverages**

Melinda B. Murray – CURO SCHOLAR  
Dr. Larry R. Beuchat, Department of Food Science & Technology, University of Georgia

The development of a standard direct plating method to enumerate *Alicyclobacillus*, a spoilage bacteria known to survive heat pasteurization processes applied to fruit, vegetable, and fruit/vegetable-based beverages, has been difficult because of varying pH and temperature optima for growth of some strains of *Alicyclobacillus* species. Ten agar media were evaluated for their suitability to support spore germination and colony development by six strains of *Alicyclobacillus acidoterrestris*, three strains of *Alicyclobacillus acidocaldarius*, and one strain of *Alicyclobacillus cycloheptanicus*. The influence of plating method, incubation temperature, and incubation time on colony development were determined. K agar, *Alicyclobacillus* medium (ALI agar), and *Bacillus acidoterrestris* thermophilic (BAT) agar recovered the highest numbers of spores. Orange serum agar and Hiraishi glucose yeast extract agar were the least suitable. Overall, surface plating was superior to pour plating and, with the exception of one strain of *A. acidocaldarius* which grew better at 50°C, incubation of K agar, ALI agar, and BAT agar plates at 43°C or 50°C resulted in recovery of equivalent numbers of spores. Essentially all viable spores were detected on media incubated for three days at 43°C. The ability of one strain of each *Alicyclobacillus* species to grow in ten non-carbonated commercially manufactured beverages at 30°C and 43°C was markedly affected by the composition of the beverages. Results show that surface plating samples on BAT agar, followed by incubating plates at 43°C for three days provide suitable conditions to enumerate ten strains of three species of *Alicyclobacillus* most commonly responsible for spoilage of beverages.

### **Annotation of Cuticular Protein Genes in *Anopheles gambiae***

John Nagao  
Dr. Judith Willis, Department of Cellular Biology, University of Georgia

Cuticular proteins make up the exoskeleton of insects. Their genes are excellent targets for research because they are developmentally regulated and abundantly expressed. The largest family of cuticular protein genes can be identified by the R&R Consensus, a highly conserved short amino acid sequence. *Anopheles gambiae* is an ideal candidate for research on cuticular protein genes because its genome has recently been sequenced. There are over 150 cuticular protein genes with the R&R Consensus in *A. gambiae*; although they belong to the same gene family, the temporal pattern of expression of these genes varies. Studying the genes for these proteins may provide significant insights into how genes are regulated. Genes for six cuticular proteins are located on the X chromosome of *A. gambiae*, but are not closely linked as are many other cuticular protein genes. There was no supporting evidence for the annotation of four of the genes. To verify the annotations, selected cDNAs were inserted into a plasmid vector and amplified in bacteria. The plasmids were then purified and sequenced. Sequences were obtained for two of these genes and I am working on the others. Temporal expression patterns for all six genes have been determined using real-time PCR, with each gene showing a distinct pattern of expression.

### **Effects of Glycerol on Processing of Kit Ligand Mutants in Mammalian Cells**

Nithya M. Natrajan – CURO APPRENTICE  
Dr. Mary Bedell, Department of Genetics, University of Georgia

Kit ligand (Kitl) is the ligand for the receptor tyrosine kinase Kit and is required for the development and proliferation of germ cells, melanocytes, and hematopoietic cells in multiple animals. In humans, abnormal Kit signaling pathways are involved in several diseases, including tumor development and pigmentation

disorders. Additionally, Kitl is used clinically to increase peripheral blood progenitor cells prior to autologous transplantation. Despite numerous studies, many aspects of the molecular mechanisms of Kitl function remain unknown. In order to obtain more information on Kitl, we are studying a series of mouse Kitl mutants. Preliminary studies suggested that some mutant Kitl proteins become misfolded and trapped intracellularly, preventing them from reaching the cell surface. Other studies revealed that glycerol acts as a chemical chaperone to stabilize misfolded proteins, thus allowing their transport to the cell surface. This project will test whether treatment of cells with glycerol will restore transport of Kitl mutant proteins to the cell surface. If glycerol does not act as a chemical chaperone for Kitl mutants, studies with other common chemical chaperones will be conducted. Once a chemical chaperone for Kitl mutants is identified, the functionality of the mutant proteins on the cell surface will be studied. The results of this experiment will contribute to knowledge on structural aspects of Kitl function and will be applicable to other growth factors with similar structures. In addition, further understanding of the actions of chemical chaperones will aid in the development of pharmacological chaperones that can be used therapeutically.

### **HESX1 Mutations in Idiopathic Hypogonadotropic Hypogonadism**

Nithya M. Natrajan – CURO APPRENTICE  
Dr. Lawrence Layman, Department of Obstetrics & Gynecology, Medical College of Georgia

Idiopathic hypogonadotropic hypogonadism (IHH) is characterized by the absence of puberty and low serum levels of the gonadotropins follicle-stimulating hormone (FSH) and luteinizing hormone (LH). Homeobox expressed in embryonic stem cells-1 (Hesx1) is involved in the early differentiation of the anterior pituitary into five cell types. Mutations in Hesx1 have been associated with Septo-optic dysplasia (SOD), isolated growth hormone deficiency (IGHD), and combined pituitary hormone deficiency (CPHD). Panhypopituitarism, midline

brain abnormalities, and optic nerve hypoplasia are the characteristics associated with SOD. Human HESX1 is a good candidate gene to study in patients with IHH because of the role it plays in SOD, IGHD, CPHD, and pituitary development. To determine if HESX1 mutations occur in IHH patients, DNAs were subjected to PCR for exons 3 and/or 4. These PCR products were sequenced and analyzed to find potential mutations. Sorting Intolerant from Tolerant (SIFT) was used to determine if missense mutations in the coding region might affect the protein. In this study, three potential heterozygous mutations were identified; one was a missense mutation (Q143E) and two mutations were identified together in the 3' untranslated region (UTR) (2043A>C and 2105G>C). These potential mutations must be studied further to determine if they affect the function of the protein. If these mutations are shown to affect protein function, then mutations in HESX1 may be a cause of IHH.

### **Curbing Private Forestland Divestment: Research into Georgia's Private Forests**

Jesse N. Oakley – CURO APPRENTICE & CURO SUMMER RESEARCH FELLOW  
Dr. Dr Laurie Fowler, Institute of Ecology, University of Georgia

Approximately 66% of Georgia's land is forested. Recently, divestment trends in the timber industry led to a massive sell-off of over three million acres. We want to understand why this is occurring, what affect it has on the environment of Georgia, and what tools can be implemented and utilized to curb forest loss. The lands were sold to developers who cut the forests and further subdivided acreage for homes or commercial growth. These forests provide society with benefits such as improved air and water quality, and habitat for wildlife. The consequences of this development include storm water discharge due to increased impervious surfaces, habitat fragmentation, altered air quality, and increased loss of biodiversity. Data collected will establish the detrimental affects divestment has on the environment and the tools available to landowners that aid in conservation.

The data will be collected through normative research, interviewing experts of the timber field and reading examples of conservation purchases around the state of Georgia and around the United States. Collected will be evidence of forest conservation and how the people conserved the land by the use of easements, leases, and other forms of Joint Purchase Agreements. We want to comprehend how some Joint Purchase Agreements were successful while others failed; also, we seek to understand different economic and social interests in these agreements. The research will have bearing on land development and the future of Georgia's forests. The study will illuminate the need for action and the availability of conservation that is both economically and ecologically rewarding.

***Brief – Solo Study Utilizing Crafting Devices in Dance Choreography***

Cara O'Grady

Prof. Bala Sarasvati, Department of Dance,  
University of Georgia

*Brief* arose as a solo study while learning and practicing the use of crafting devices to develop choreography in a dance composition course. The vocabulary chosen was simple and selected from the modern dance genre. The project began as a chance to utilize different forms, speed, levels, and perception of eight different movements. These actions were chosen by physically and internally exploring how the ideas of vulnerability, detachment, abandonment, regret, and reaction as expressed in human body language. The movements were then modified to be only an abstract interpretation. This abstraction created potential for broader viewer and performer interpretation and experience. After selecting and honing appropriate vocabulary, I set about examining how many different ways the movement could be performed in a repetitious manner. Augmentation, both of space and time; together and separate, were first used. Then the perception and angle of the movement was varied to vary audience perception and possible reaction. Likewise speed, body parts, transposing, effort, loco-motor and non-

locomotor elements were shifted, rearranged and added. Finally, with the developmentally structured new arrangement, the elements of music and personal performance were added as layers to morph the attitude and overall effort quality of the work. Peers, and mentor faculty member Bala Sarasvati, for clarification and precision of intent, reviewed the work.

**Gender Meaning Parity and the Gay Movement: A Cross-cultural Study of Developing Movements**

Noona Oh

Dr. Dawn Robinson, Department of Sociology,  
University of Georgia

The development of the gay movement is increasingly visible on the international stage with the multi-national emergence of gay and lesbian rights movements. This research examines the role of gender parity in the development of gay and lesbian movements in Canada, China, Germany, Japan, and United States. It compares the cultural meanings associated with gendered and sexual identities in the five nations to ascertain the relative favorability of social environments conducive to gay and lesbian movement success. Variations along the Evaluation, Potency, and Activity (EPA) meanings of these identities revealed the social and cultural basis from which a gay movement operates and also predicted the probability of a mature or undeveloped movement. Country rankings were derived from calculations of EPA disparities between man and woman identities and formed the predictions for movement maturity. These predictions were tested with a qualitative analysis of movement development using a coding scheme indexed along six dimensions of movement success. Observed rankings based on movement success largely reflect the initial rankings derived from EPA measures of gender meaning differences. Countries with greater gender meaning equality have mature gay and lesbian movements while countries with greater disparities in gender meanings tend to have less developed gay and lesbian movements. In addition, the relative affective meanings of homosexual identities

closely reflect the actual development trends in the gay movements and capture important differences between them.

### **Characterizing PGMRC1, an Enzyme Suspected in the Regulation of the Cytochrome P450 CYP51A1**

Ezinne A. Okwandu

Dr. William Lanzilotta, Department of Biochemistry & Molecular Biology, University of Georgia

Cytochrome P450s are ubiquitous heme-containing proteins that play crucial roles in several biosynthetic and drug metabolism pathways in humans. My research focuses on a novel regulation mechanism for the human P450 enzyme, CYP51A1, by the progesterone receptor membrane component-1 protein (PGMRC1p). CYP51A1 is required for lanosterol demethylation during ergosterol synthesis in humans. The PGMRC1 protein is a member of the membrane associated progesterone receptor binding proteins and has been proposed to regulate cytochrome P450 activity in the biosynthesis of cholesterol by directly activating and/or inhibiting the lanosterol 14 $\alpha$ - demethylase enzyme. These observations have fostered the hypothesis that PGMRC1 may have a broader role in activation of P450 enzymes involved in the degradation of cancer drugs. Given the diverse functions of P450s in general, it is important to understand how heme interacts with PGMRC1 and how the heme-PGMRC1 complex alters cytochrome P450 activity. At the present time research has focused on characterizing the biophysical properties of the yeast homolog (with and without heme bound). In order to characterize the human enzyme, we have initiated a study to express PGMRC1 successfully, optimize purification of the protein and begin to analyze the biophysical properties of the protein. In addition, the heme concentration was also measured and crystallization trials have been initiated in order to eventually determine the structure of protein using X-ray crystallography. NMR spectroscopy shows that in the current buffer conditions the purified protein exists

predominantly as a molten globule and therefore a search for new buffers has been initiated.

### **Tax Binding to Various CBP Domains**

Ezinne A. Okwandu

Dr. Jennifer Nyborg, Department of Biochemistry & Molecular Biology, Colorado State University

The Tax protein is a potent transcriptional activator that stimulates the expression of the Human T-cell Leukemia Virus type 1 (HTLV-1) provirus. HTLV-1 is a retrovirus that causes human T-cell leukemia. Previous studies have shown that Tax interacts with the cellular transcription factor CREB and viral cyclic AMP response elements (vCREs) in the viral promoter to recruit the pleiotropic coactivators CBP and p300. The interaction of Tax, vCREs, CREB and the CBP/p300 proteins recruits transcriptional machinery beginning the transcription of viral DNA inside the host cell. Although the mechanisms behind Tax's role as a transcriptional activator are not fully understood, Tax binding to various CBP domains has been explored in detail. Previous research indicated that the interaction between Tax and the KIX and C/H1 domains on CBP is believed to be responsible for the recruitment of the coactivators to the HTLV-1 promoter. More recent research studies show that Tax interacts with a domain located towards the carboxy-terminus of CBP, known as CR2. This study compares Tax interaction with the, KIX domain, C/H1 domain, KIX and C/H1 fusion domain and the CR2 domain in the presence of vCREs and CREB *in vitro* using western blots. The bands were quantified using Imagequant application software. The experiments showed strong Tax binding to the CH1/KIX and KIX domains and some Tax binding to the CR2 binding. Unraveling the mechanisms of Tax binding to the viral promoter may help solve the mystery surrounding the reproductive cycle of retroviruses such as HIV and the HTLV-1.

### **Kinetics of Inhibition of Polygalacturonases and Polygalacturonase-inhibiting Proteins**

Victor M. Orellana – CURO APPRENTICE

Dr. Carl Bergmann, Complex Carbohydrate Research Center, University of Georgia

*Endopolygalacturonases* (EPGs) are important fungal pathogenicity factors, and are among the first enzymes secreted when fungi are grown on isolated plant cell walls as a sole carbon source. EPGs hydrolyze deesterified regions of wall-bound homogalacturonans, opening up the wall to the action of other *exo*- and *endoglycanases*. During pathogenesis, interactions between fungal EPGs and plant-derived polygalacturonase-inhibiting proteins (PGIPs) may alter the hydrolytic activity of the EPG. EPGs from a single strain of fungus may exist in a variety of isoforms and may vary in their mode of action as well as in their ability to interact with, and be inhibited by, PGIPs. In addition, the PGIPs of a single species may be present as a set of isoforms. The mode of action of a particular fungal EPG and its inhibition by PGIPs may be critical factors in determining whether the fungus is a viable pathogen. In the last few years, work by our lab and others have begun to unravel the mechanism of action and of inhibition. We have used mass spectrometry, surface plasmon resonance spectrometry (SPR), and molecular modeling to study the binding site of the EPG for its homogalacturonan substrate and the mechanism of substrate cleavage. We have also used these same techniques to investigate the binding of EPG to PGIP and the interaction between these two proteins. The literature on the kinetics of inhibition is, however, somewhat contradictory. In response to this problem, the work presented here is part of a detailed kinetic analysis of *Aspergillus niger* EPG-PGIP interactions.

### **Gentrification in Athens, Georgia: A Two-sided Coin in a County with the Fifth Highest Poverty Rate in the Nation<sup>1</sup>**

Katie Orlemanski – CURO SUMMER

RESEARCH FELLOW, CURO SCHOLAR

Dr. Patricia Richards, Department of Sociology, University of Georgia

The purpose of this thesis is to clarify the concept of gentrification. I examine a range of definitions and theories that have been explored since the coining of the term by Ruth Glass in 1964. I outline why the study of gentrification is important to anyone interested in the physical, economic, social, and/or cultural aspects of urban space. Because I argue that there is no single coherent vision of the meanings, causes, and experiences of gentrification, the latter part of this paper examines a specific gentrification encounter through a case study of development in Athens, Georgia. Within the methodology section, I discuss the meaning and importance of my actor-oriented approach to research based in interviews with community members and some of the benefits and difficulties it posed. An analysis of my research from Athens follows that applies the theoretical concepts of gentrification introduced earlier. The conclusion of this thesis offers suggestions for confronting gentrification issues in Athens, Georgia while also posing questions that need further examination. It is my hope that this thesis will help shed light on the various experiences of gentrification in Athens in order to promote a more comprehensive development policy for the city.

### **The Effects of Heat Shock on the Lethality of Subsequent Infection in *Drosophila melanogaster***

Katharine A. Owers, CURO SCHOLAR

Dr. Daniel Promislow, Department of Genetics, University of Georgia

When an organism receives a heat shock, heat shock proteins (HSPs) are synthesized, conditioning the organism and making it more

---

<sup>1</sup> For counties with populations 100,000 or more

resistant to later heat shocks. Infection, like heat shock, is a stress that releases HSPs, but the relationship between heat shock and infection has so far been studied little. Because heat-induced HSPs help organisms deal with later heat stress, I predict that they also help fight stress from infection and thereby decrease the lethality of disease. I also predict that the effects of heat-shock on lethality are temperature-dependent. These hypotheses are being tested with *Drosophila melanogaster*. One group of flies is heat shocked prior to infection, while the other is only infected. Flies were infected with *Lactococcus lactis*, a gram-positive (toxin-releasing) bacterium, at a dose causing death of between 50 and 60 percent of infected flies. Post-infection, flies were incubated at various temperatures. The effects of heat shock were measured by comparing mortalities of the different treatment groups. Preliminary results are inconclusive, but if heat shock affects susceptibility to disease in *D. melanogaster*, then increased temperatures, such as those under global warming, might constitute a heat stress that could change the lethality of disease. Because *D. melanogaster* is a model for ectotherms, including many economically important organisms, these results could have broader implications.

### **Infectious Plant Pathogen: *Botrytis cinerea***

Shreyal C. Patel

Dr. Carl Bergmann, Complex Carbohydrate Research Center, University of Georgia

*Botrytis cinerea* is a widespread plant pathogen that causes grey mold or soft rot on the host tissues and is responsible for significant economic losses. *B. cinerea* must breach the cell wall during the infection process and accordingly secretes multiple enzymes that can degrade cell walls. Among these cell wall-degrading enzymes are endopolygalacturonases (EPGs), which are some of the first enzymes secreted. Thirteen EPG isoforms have been described in *B. cinerea*, although the possible functions for each in pathogenesis have not been fully elucidated. Six *B. cinerea* genes encoding EPGs have been studied and the results indicate

that each gene is differentially expressed depending on factors such as the stage of infection, the plant species and the temperature. A focus of my research is the interaction during pathogenesis between fungal EPGs and plant cell wall derived inhibitors of EPGs known as polygalacturonase-inhibiting proteins (PGIPs). The mode of action of a particular fungal EPG and its inhibition by PGIPs may be critical factors in determining whether the fungus is a viable pathogen. The glycosylation patterns on the EPGs and PGIPs have been implicated in the way these two classes of proteins interact, and there is some evidence that glycosylation may change during pathogenesis. In this research, we undertook a complete mapping of the patterns of glycosylation on the EPG BcPG3. These results will serve as the basis for future site-mutations in order to dissect the role the different carbohydrate side chains play in pathogenesis and EPG-PGIP interactions.

### **Developing a Biocontrol Agent for Chinese Privet, *Ligustrum sinense***

Tulsi Patel – CURO APPRENTICE

Dr. Scott Gold, Department of Plant Pathology, University of Georgia

*Ligustrum sinense*, commonly known as Chinese Privet, is an exotic weed that currently invades millions of acres of land in the southeastern United States. The weed has the potential to outcompete many native species because it grows in various climatic conditions, and birds and small animals rapidly disseminate its seeds by consuming Privet fruits. Although privet is one of the most harmful weeds in the southeastern United States, there is no efficient mechanism to control its growth. The purpose of this project is to develop a cost effective biocontrol agent for *L. sinense*. This goal may be achieved by using a fungal pathogen that secretes large amounts of an amino acid that is detrimental to privet. The first step in finding such a fungal pathogen is to identify an amino acid that is toxic to Chinese privet. Preliminary tests in which Privet plantlets were treated with nine amino acids have shown that Lysine, Methionine, and Valine are three amino acids

that are most toxic to the plants. Next, we will create a mutant fungal pathogen that secretes large amounts of one of these inhibitory amino acids and test it for host specificity. If successful, this project will provide an effective biocontrol agent for Chinese privet and a model that could be used to control other exotic weeds.

### **Media Development, Journalism and Democratization in Croatia**

Danielle L. Pearl – CURO SUMMER RESEARCH FELLOW

Dr. Keith Langston, Department of Germanic & Slavic Languages, University of Georgia

Since declaring its independence from the former Yugoslavia in 1991, Croatia has made significant social and institutional advances toward building a truly democratic polity. Nevertheless, the independence and legitimacy of the news media pose a continuing challenge to Croatia's democratic aspirations. This project constitutes a qualitative analysis of the current state of development of the news media in Croatia, assessing what factors and conditions prevent the media there from fulfilling their role as the "fourth estate" in this young democracy. This project examined the nature and causes of constraints on a legitimate, professional and effective media in Croatia through a series of moderately structured interviews with Croatian journalists and other media practitioners associated with a variety of print and broadcast news media. An analysis of these interviews was used to identify a set of specific policy options available to the Croatian media, government, publics, and concerned non-governmental organizations to improve media independence and legitimacy in Croatia. It is hoped that the results of this research will be of further use to scholars and policymakers in fields including media studies, democratic, post-communist and post-conflict development, and contemporary Croatian politics and society.

### **Metropolis Monte Carlo Simulations of Thin Ferromagnetic/Antiferromagnetic Bilayers**

Daniel Perry – CURO SUMMER RESEARCH FELLOW, CURO SCHOLAR

Dr. David Landau, Department of Physics & Astronomy, University of Georgia

Ferro/Antiferromagnetic bilayers exhibit several interesting properties. One such property is called Exchange Bias (EB), which is a shifting of the hysteresis loop so that it is not symmetry about zero applied magnetic field. A hysteresis loop can be observed through quantitative analysis of ferromagnets by sweeping a magnetic field from a positive value to a negative and then from a negative value back to a positive. With the addition of an antiferromagnetic layer to the ferromagnetic layer, EB is observed in the laboratory. EB effectively stabilizes a system, making it useful in hard drives and potentially other nanotechnologies. A fundamental understanding of EB is important for the field of nanotechnology, but to date, the interactions that drive EB are not fully understood. This research aims to obtain a general understanding of the interactions that produce EB by using a simple atomistic model. Metropolis Monte Carlo simulations were used on a Body-Centered Cubic lattice. The parameters that were used to explore the properties of the model were temperature, lattice size, and the interface interactions between the two films. There are 3 types of interactions: exchange, crystal field and dipole-dipole. The dipole-dipole interactions are long range and simulated using effective anisotropy in the model. The resulting data revealed phase transition temperatures, phase transition fields, and hysteresis loops. These results differed slightly with temperature, but more so with interface types. The uniform interface was found to be useful for understanding the model. The random and step interfaces were used to mimic more realistic interfaces. Thus far, none of the interactions produce EB in the model, so it can be concluded that this model does not sufficiently describe a bilayer system. These results show that

current theory concerning EB is either incomplete or incorrect.

### **Polygalacturonase-inhibiting Proteins and Their Relationship to Polygalacturonases**

Aaron C. Petrey

Dr Carl Bergmann, Complex Carbohydrate Research Center, University of Georgia

The plant cell wall is a major barrier against attempted invasions by phytopathogenic fungi, therefore the plant cell wall-degrading enzymes produced by fungi play an important role in their pathogenicity. Endopolygalacturonases (EPGs) are responsible for much of the pectin-degrading activity of plant pathogenic fungi and are among the first molecules secreted upon fungal infection of plants. EPGs cleave the linkages between D-galacturonic acid residues in non-methylated homogalacturonan.

Polygalacturonase-inhibiting proteins, or PGIPs, are important defensive proteins which exist within plant cell walls. PGIP proteins inhibit the activity of fungal polygalacturonases (PGs) which are part of the primary method of cellular invasion by fungi such as *Fusarium moniliforme*. Until recently, little was known about the mechanism of action of EPGs. There has been an equal lack of information regarding the mechanism of interaction between EPGs and PGIPs. Previous results have demonstrated that the relationship is pH dependent. Here the relationship of fungal EPGs, plant PGIPs, and PGA (polygalacturonic acid, the pectic substrate) is examined in order to determine kinetically if the inhibition of *Fusarium moniliforme* EPG by snap bean PGIP is competitive or noncompetitive. The mechanism of inhibition has been widely debated and the results of this research fit nicely with our model that the PG binds on the underside of the EPG-complex in a noncompetitive fashion. These data are in contradiction with analysis performed by other researchers and suggest the need to perform further kinetic experiments to evaluate the relationship of many PGIP glycoproteins with their EPG enzyme counterparts.

### **Effects of Alcohol Use on Cognitive Ability**

Natalie M. Picchetti

Dr. Jennifer McDowell, Department of Psychology, University of Georgia

Inhibition allows inappropriate responses to be suppressed and appropriate responses to be made. A simple model of inhibition is based on antisaccade performance, which is presumably mediated by the pre-frontal cortex. During an antisaccade trial, participants are required to move their eyes as quickly and accurately as possible to the mirror image (opposite side; same amplitude) of a target presented in the periphery. Alcohol decreases activity in the pre-frontal cortex, and might be expected to affect antisaccade performance. Previous research has shown that individuals with alcohol dependence have increased antisaccade errors. A high percentage of errors can also be a predictor for potential susceptibility to alcohol dependence. Young adults with a family history of alcoholism make increased errors compared to those who do not. From these results it was hypothesized that normal undergraduates with heavy alcohol use will make more antisaccade errors compared to individuals with light alcohol use and that a positive relationship will exist between the number of antisaccade direction errors and extent of alcohol use. Anti-saccade performance was measured in 100 undergraduate students who were screened for alcohol and drug use. Eye movements were recorded with the infrared oculography and the data were evaluated for percentage of direction errors. Relationships between antisaccade errors and alcohol use were calculated using correlations and T-tests were used to determine any possible relationships between the two extreme groups from the entire distribution, heavy and light drinkers. The results of this experiment will be presented.

### **My Neighbor's Keeper: Social Capital as a Means of Mediating Extremist Activity**

Andrew W. Pierce – CURO SUMMER RESEARCH FELLOW

Dr. Tom McNulty, Department of Sociology, University of Georgia

Among the benefits created by social capital, defined as the resources embedded in social networks, is reportedly a decline in extremist activity. Previous research states that isolated members of society are the most likely to join extremist movements, and that high levels of bridging social capital, which is the type of social capital that includes the most people, bring isolated individuals into society thereby precluding their involvement in extremist movements. To investigate the interaction between social capital and extremist activity, social capital indicators and hate crime data were collected for all fifty states. The social capital indicators were compiled into a social capital index at the state level which, when compared to hate crime rates at the state level, can explain patterns of extremist behavior. Regression analysis was used to measure the relationship between several social capital indicators and hate crime rates. The analysis showed that bridging social capital indicators are negatively correlated with hate crime rates to a significant degree. These results imply that strategies important to growing social capital can be viewed as strategies to decrease current extremism in the Middle East or curb the growing extremist movements in Europe.

### **Expression, Optimization and Crystallization of Cystathionine $\beta$ -Synthase and Cystathionine $\gamma$ -Lyase**

Richard C. Piercy – CURO SUMMER RESEARCH FELLOW

Dr. Cory Momany, Department of Biomedical & Pharmaceutical Sciences, University of Georgia

An elevated homocysteine level in blood serum has been determined to be a significant risk factor for arteriosclerosis. In the reverse transsulfuration pathway two Pyridoxal 5-Phosphate (PLP) dependent enzymes metabolize

homocysteine to the end product of cysteine. Cystathionine  $\beta$ -synthase(CBS) metabolizes homocysteine into cystathionine which is then metabolized into cysteine by cystathionine  $\gamma$ -lyase(CGL). This research is of the basic type that has the goal to develop a reproducible process to yield crystals of CBS and CGL which will be studied in order to solve the full-length structures of each. The hypothesis is that a defect in either CBS or CGL could be a leading cause of arteriosclerosis. Full structures could help confirm or deny this claim and possibly lead an alternative treatment. Modifications were made to previous protocols to crystallize CGL and CBS. Those attempted with CGL include expression in auto-induction media, French-Pressure cell press for cell bursting, and Fast-Flow Crude columns to quickly and efficiently remove cellular material from enzyme supernatant. After purifying using High Performance Liquid Chromatography (HPLC) the enzyme was then dialyzed, concentrated and added to a crystallization buffer. Concentration of purified CGL failed to yield a concentration above 10.6mg/L. Crystallization attempts to date have failed both in the lab and at the Hauptman-Woodward high-throughput facility. CBS, a heme and PLP dependent protein requires an excessive amount of heme for proper expression. The expression of CBS without a heme transport mechanism has seen mixed results in protein quality in the past so the pHEX-2 plasmid was selected for transformation along with CBS. This plasmid provides a heme-transport system for the *E. coli* host as CBS needs an excessive amount of heme to be fully translated. Double transformations into Rosetta-2 (DE3) pLysS cells have failed all double antibiotic platings to date. Further attempts will be made with different transformation techniques as well as alternative plasmids to more effectively express CBS.

**Public Space in a New Urbanist  
Development: A Case Study of Atlantic  
Station**

Emily Powers – CURO SUMMER RESEARCH  
FELLOW

Dr. Steven Holloway and Dr. Katherine  
Hankins, Department of Geography, University  
of Georgia

Situated on the 138-acre site of the former Atlantic Steel Mill in midtown Atlanta, Atlantic Station is an example of a new urbanist “mixed-use” development. The “live, work, play” design of Atlantic Station is a worthy replacement to the abandoned industrial eyesore; it has benefited the city of Atlanta and state of Georgia with its new jobs and favorable press. At the same time, questions remain about the nature of the public space available in Atlantic Station. The case study investigates the intended and the realized spaces produced by Atlantic Station as well as reveals the multiple definitions of the term “public,” which are underexamined in contemporary geography literature about public space. Through qualitative investigation including interviews with Atlantic Station residents, consumers, and employees in addition to participant observation, this research reveals the degree to which Atlantic Station developers and retailers provide highly regulated spaces that emphasize walkability and shopping convenience, which are celebrated by residents and consumers alike. Atlantic Station’s public is utilizing the regulated spaces, but it is not challenging the democratic spaces in question; the consumerist citizens are not searching for more representation. This “well-behaved” public is not claiming space for active citizenship but rather it is participating in the spaces so carefully designed for its consumption. It is a public space that, by all appearances, has been severed from the state.

**American Investment in a Post-Castro Cuba**

Lucas L. Puente

Dr. Stephen Shellman, Department of  
International Affairs, University of Georgia

Cuba represents a potential American investment market that is currently untapped. Currently, the U.S. imposes an embargo, banning trade with Cuba, but a repeal of this economic boycott would reap large benefits for Americans and Cubans. The presence of political resistance, economic uncertainties, and current trade alliances all pose as a threat to the opening of trade. However, significant trade and economic data from the U.S. Department of Commerce will demonstrate the objective of this research: the enormous financial potential of open trade with Cuba. Furthermore, data will be analyzed in order to show the advantages of trade liberalization for Cuba, given certain American incentives. The future of Cuban-American relations is now: the implementation of liberalized trade will catalyze Cuban-American relations for the years to come.

**Effects of Mg/HA on Growth and  
Differentiation of Osteoblast Cells (Bone  
Cells) in a Hydroxy Apatite Scaffold**

Crystal Rapier

Dr. William Kisaalita, Department of Biological  
& Agricultural Engineering, University of  
Georgia

Biodegradable polymer scaffolds are currently being widely investigated in the effort to create both a reliable and efficient support mechanism to promote the growth of new bone tissue. Many of the current metal, synthetic cement and bioceramic materials being used have numerous limitations. There is an imminent need for alternative bone biomaterial therapies that promote natural, rapid, controlled, and healthy cell growth that will improve the quality of life for the thousands of people who go through joint or dental bone replacements. In the current study, we examine the addition of magnesium mineral deposits (Mg<sup>+</sup>) on biodegradable ceramic polymer nano-hydroxyapatite (HA)/ pol(L-lactic acid) (PLLA) scaffolds. Osteoblast

growth on the novel nano-HA/PLLA/Mg<sup>+</sup> scaffolds are being compared to growth on nano-HA/PLLA scaffolds to observe possible improvement in bone development. The objectives of this study are to determine and compare the proliferation rate and differentiation proficiency of osteoblast cells between scaffolds. Currently, cell proliferation (doubling time) is being compared utilizing a 3-(4,5-Dimethylthiazol-2-yl)-2,5-diphenyltetrazolium bromide (MTT) assay. MTT assays determine the amount of viable cells in a given sample by quantifying cellular mitochondrial dehydrogenase activity. Bicinchoninic acid protein assays will be utilized to measure the amount of collagen made by differentiated osteoblast cells. Analyzing the amount of collagen will determine if the incorporation of magnesium enhanced the health and functionality of osteoblasts on the scaffolds. Results have shown that both nano-HA/PLLA scaffolds and Mg<sup>+</sup> incorporated nano-HA/PLLA scaffolds are biocompatible and osteoconductive to osteoblast cells *in vitro*. Initial MTT experiments have shown that an increase in osteoblast cell growth has occurred in the scaffolds containing magnesium. So far, we conclude that the addition of magnesium to the scaffolds has increased osteoblast proliferation. However, further testing will be required to assess the overall consequence of magnesium addition to nano-HA/PLLA scaffolds.

### **Migration Reduces Parasite Prevalence in Monarch Butterflies**

Rachel M. Rarick

Dr. Sonia Altizer, Institute of Ecology,  
University of Georgia

The protozoan parasite *Ophryocystis elektroscirrha* commonly infects monarch butterflies (*Danaus plexippus*) and causes reduced longevity and flight ability of their hosts. Monarchs occur worldwide in non-migrating populations but are best known for the population in eastern North America that migrates annually to overwinter in Mexico. Parasite prevalence is lower in migratory versus non-migratory populations. One reason for this

could be that harsher conditions in migratory populations – including the strenuous migration itself – reduce the number of infected individuals. To test this prediction, we compared infection rates of successfully migrated monarchs in Mexico with those caught in Georgia and Florida en route to their overwintering sites. We also compared monarchs at two different overwintering sites in Mexico, one of which (Sierra Chincua) has harsher microclimatic conditions than the other (Cerro Pelon). To determine infection status, we pressed pieces of clear tape on monarchs' abdomens and counted parasites on these using a microscope. At the overwintering sites we also measured butterfly forewing length, wing damage and abdominal fat. We found that infection rates of monarchs wintering in Mexico were lower than among monarchs caught during their migration. Also, monarchs at Sierra Chincua had lower fat reserves and higher infection rates than those at Cerro Pelon. These results support the hypothesis that harsher conditions and the migration process itself can reduce parasite prevalence in migratory populations. Monarch migration is currently threatened by human activities; our results have implications for understanding how this could alter parasite prevalence.

### **Towards a More Effective Delivery System for Anti-cancer Drugs**

Mandy Redden – CURO SUMMER

RESEARCH FELLOW

Dr. Robert Arnold, Department of  
Pharmaceutical & Biomedical Sciences,  
University of Georgia

Sterically-stabilized liposomes (SSLs) have been used to encapsulate camptothecins (e.g. topotecan). These potent anticancer agents have a broad spectrum of activity, but their clinical utility is limited by poor aqueous solubility, reversible pH-dependent metabolism, and rapid release, which limits tumor exposure to the drug. Encapsulating the inactive, water-soluble form of topotecan in SSLs is hypothesized to maximize drug retention and produce a sustained release at tumor and/or metastatic sites

of disease, while minimizing toxicity. Small (90 nm) liposomes with a composition of DSPC, cholesterol and PEG-DSPE in a 9:5:1 mole ratio were prepared, and their performance, drug stability and release in different buffering systems over time were determined. Lipid composition was determined spectrophotometrically using a modified inorganic phosphorus assay, and topotecan content was determined using a spectrophotometric microplate reader at an absorbance of 384nm. Preparation of SSLs in 5.4 pH buffered ammonium sulfate (250 mM) with basic topotecan loaded at drug:lipid ratio of .25 achieved an 87% loading efficiency, while SSLs in 7.4 pH buffered solution with acidic topotecan loaded at a drug:lipid ratio of 0.25 resulted in a loading efficiency of 81%. Both SSLs showed fairly stable lipid compositions after dialysis over a 102 hour time period at 20°C with gradually decreasing concentrations of drug. These data suggest that SSLs can be used to efficiently encapsulate and slowly release drug over time. Further examination under *ex vivo* conditions are ongoing and will be used to support future in vivo studies with the goal of improving treatment of prostate and breast cancer while limiting drug toxicity.

### **Development and Evaluation of a Coping Skills Training Program for Adolescents with Inflammatory Bowel Disease (IBD)**

Eva Bonney Reed – CURO SUMMER RESEARCH FELLOW, CURO SCHOLAR  
Dr. Ronald Blount, Department of Psychology, University of Georgia

The current study is a skills-based, psychological intervention for adolescent girls and their families aimed at reducing the pain associated with Inflammatory Bowel Disease (IBD) and at increasing quality of life. Inflammatory bowel disease refers to Ulcerative Colitis and Crohn's Disease, chronic gastrointestinal diseases. In general, studies investigating the psychological health of children and adolescents with IBD have shown that they demonstrate higher levels of psychological problems than do healthy controls

(Engstrom, 1992; Engstrom & Lindquist, 1991; Mackner, Sisson, & Crandall, 2004). To decrease negative symptoms and improve daily functioning, skills such as problem solving, pain management, communication, and relaxation will be taught in the one-day program. Following the intervention, all participants will complete a web component to reinforce the skills learned in session. The first intervention is scheduled for winter 2007, and the paired wait-list control group intervention will take place six weeks following. All participants in the intervention (N=32) will be recruited from Children's Center for Digestive Healthcare in Atlanta, Georgia. Participating families will answer psychological questionnaires before and after the intervention program including the web component, and six months following the intervention to assess changes. We predict that the adolescents will report a reduction in abdominal pain, functional disability, and also in symptoms of depression and anxiety. Further, we expect parents to report a reduction in their daughters' abdominal pain, functional disability, and other somatic symptoms. Data will be assessed using both within group (pre-, post-, and follow-up for all subjects) as well as between group (treatment vs. wait-list control) analyses.

### ***Conversations with God***

Patricia Lynn Rhudy

Prof. Ted Saupe and Prof. Sun Koo Yuh,  
Department of Ceramics, University of Georgia



I make small figures out of clay. When I start working on a piece, I only have a very rough concept about what it is going to look like or even what emotion I choose to evoke. I work quickly and responsively with the figures, using my eyes and then my mind. If I like the placement of an arm, a leg, or the tilt of a neck, I keep it. If I do not, I change it. I make art that I relate to. If I like it, if it somehow speaks about something real inside of me, then maybe someone else can relate to it as well.

Ceramic  
2006

### **Determining the Affinity of Perchlorate for Albumin in Rat Serum Using Equilibrium Dialysis and Ion Chromatography**

Lisa Rivard – CURO SUMMER RESEARCH FELLOW

Dr. Jeffrey Fisher and Dr. Jerry Campbell,  
Department of Environmental Health Science,  
University of Georgia

Perchlorate ( $\text{ClO}_4^-$ ) is a prospective health concern and is currently listed on EPA's Contaminant Candidate List. Upon ingestion from drinking water and other sources,  $\text{ClO}_4^-$  enters the bloodstream, inhibits iodide uptake in the thyroid gland, and in turn decreases the body's ability to produce the thyroid hormones

T3 and T4. This study was performed to determine the binding affinity of  $\text{ClO}_4^-$  to serum proteins and to determine if iodide is a competitive inhibitor in this process. Laboratory conditions were developed to simulate body conditions. An equilibrium dialysis system was set up by loading 10 Teflon® cells. Each cell had a semipermeable membrane to separate rat serum from saline spiked with  $\text{ClO}_4^-$  in concentrations from 195 to 100,000 ng/ml. The cells were rotated in a 37°C water bath for four hours to equilibrate and allow  $\text{ClO}_4^-$  to bind to serum proteins. The cells' contents were removed via syringe and then further prepared for ion chromatograph analysis. The equation  $C_{\text{bound}} + C_{\text{free}} = C_{\text{total}}$  was used to determine the amount of  $\text{ClO}_4^-$  bound to serum proteins, where C represents concentration of  $\text{ClO}_4^-$ . An overall trend of approximately 11.0-24.0% of  $\text{ClO}_4^-$  was bound to serum proteins. When the experiment was repeated with the addition of 6250 ng/ml iodide to the saline solution, the approximate percentages of  $\text{ClO}_4^-$  bound did not change. These data suggest that  $\text{ClO}_4^-$  binds to serum proteins at approximately 11.0-24.0% of its total concentration and that iodide is not a competitive inhibitor in this process at iodide levels of 6250 ng/ml. Perchlorate travels to the thyroid gland, these data suggesting probably by means of nonspecific attachment to serum proteins, and can decrease the body's production of T3 and T4. The length of time  $\text{ClO}_4^-$  remains bound to serum proteins and is thus able to remain in the bloodstream and reach the thyroid is left to be determined; a future study would be applicable in this area.

### **Applying Koch's Postulates of *Mycobacterium shottsii* Infections in Fish**

Rebecca L. Satterfield

Dr. Frederick Quinn and Dr. Russell Karls,  
Department of Infectious Diseases, University of Georgia

Striped bass (*Morone saxatilis*) from the Chesapeake Bay experienced an epizootic outbreak of mycobacteria beginning in the year 2000. A newly-identified bacterial species *Mycobacterium shottsii* was detected in a large

percentage of the diseased fish. The infected fish exhibited ulcerative lesions on the skin and granulomas in the kidney and spleen. In this case, Koch's postulates require that a pure culture of the bacterial agent can cause the granulomatous lesions and skin ulcers in experimentally infected fish and that the organism can be re-isolated. The goal of this project is to demonstrate Koch's postulates with *M. shottsii* using zebrafish as a model system. Thus, our hypothesis is that *M. shottsii* will infect zebrafish and produce lesions similar to those detected in infected striped bass. In this study, either *M. shottsii* bacteria or sterile saline was injected into the coelomic cavity of individual zebrafish. Both groups of fish were monitored for 25 days after which pathological analyses of euthanized fish revealed the presence of granulomas in the kidneys and liver of only the *M. shottsii*-infected group. Thus the first half of Koch's postulates has been completed. Re-isolation and culture of *M. shottsii* is ongoing due to the extremely slow growth rate of this bacterium and an abundance of faster growing commensal bacteria in the zebrafish. Long term infection experiments are in progress to demonstrate ulcer formation.

#### **North Korea: Options for Dealing with a Nuclear Armed State**

Aaron M. Sayama – ROOSEVELT @ UGA  
Dr. Stephen Shellman, Department of  
International Affairs, University of Georgia

North Korea's recent nuclear test is an unsettling and worrisome act of aggression to global security and to the nuclear nonproliferation status of nations around the world. The perceived regional threat accompanying North Korea's declaration of nuclear capability could serve as a catalyst for a dangerous game of East Asian nuclear armament. Convincing North Korea to surrender its nuclear weapons program should be a top strategic priority for the United States. However, current US policy would have the world drive North Korea into further isolation. By pushing North Korea further out of global politics it will only exacerbate the problem. This paper will explore the proposed

options for dealing with the North Korean nuclear crisis, assessing the advantages and disadvantages of each solution. A comprehensive, multilateral incentives package aimed at bringing North Korea out of its deep isolation is the most efficient and direct way of handling the issue of nuclear engagement. Such a package, negotiated in talks led by China, should include increased economic support from Japan, agricultural reform through South Korea, and a new and updated agreed framework previously laid out by the Clinton administration. This new agreed framework and multilateral action by neighbors to North Korea would provide the best basis for nuclear disarmament.

#### **Femininity as a Continuum: From Battered Victim, to Self-Defense Aggressor, to Lesbian and to Barbarian**

Kathryn L. Scheffel – CURO SCHOLAR  
Dr. Dean Rojek, Department of Sociology,  
University of Georgia

It has been estimated that 1 in 10 persons arrested for murder is a woman, 1 in 50 death sentences imposed at the trial level is for a woman, 1 in 70 death row inmates is a woman, and 1 in 97 persons executed in the current era is a woman (Streib 2006). Due to this disproportionate representation, it is believed that there is a discriminating factor that greatly influences female murder trials more than the details of their crime. A contention has been made that a woman's degree of femininity is the ultimate deciding factor in determining the type of charges brought against her and, most often, the verdict of her criminal trial. This study will examine the implications of the degrees of femininity which are exemplified by the distinct types of women currently found within the criminal justice system: women who claim Battered Woman's Syndrome as a self-defense plea, women who defend themselves against their abusers, lesbians involved in capital cases, and women whose offenses aid in their categorization as being part of The Evil Woman Theory. Inherently these offenders share the same gender, but how their gender is portrayed

during their trial is disparate of one another. The issue of femininity is not only a case of discrimination against homosexual women, but also evidence of gender inequity occurring within the criminal justice system.

Understanding the factors that influence a female offender's trial aids in arguing that the process for determining which offender receives a death penalty sentence is arbitrary and capricious.

### **Identifying the Source of an Introduction of Yellowfin Shiner**

Clare H. Scott

Dr John Wares, Department of Genetics,  
University of Georgia

The introduction of a species into an environment where it is not native can have profound effects on that habitat such as a loss of native species and changes in the habitat where the organism was introduced. These events can also have a profound effect on the evolution of the introduced species, depending on the source and size of the introduction. Often determining the source of the introduction can be difficult due to the large native range of the species and the amount of time that has elapsed since the introduction. However, the Yellowfin shiner has recently been introduced to the Little Tennessee River (fewer than 10 generations ago). Also its range (with populations in the Chattahoochee and Altamaha basins in Georgia, and the Savannah, Broad, and Santee basins in South Carolina) is contained within the southeast US in close proximity to Athens, GA. Given these factors this study will be attempting to identify the source of the introduction and the initial size of the introduced group using genetic markers. I amplified mitochondrial and nuclear DNA gene regions, along with microsatellite markers, from each native population of Yellowfin shiner.

These markers represent different portions of the genome and undergo different forms of selection and inheritance, which makes them useful in identifying the source population. By identifying the source it will be possible to observe the rate of evolution of a species that is adapting to a new habitat. Our results will also provide

information about the dynamics of species introductions that can be used to manage other freshwater introductions.

### **Unsuspecting Targets – Preparing America's College Towns for a Bioterrorism Attack**

Deep J. Shah – ROOSEVELT @ UGA

Dr. Loch Johnson, Department of International Affairs, University of Georgia

Review of biosecurity literature, analysis of federal documents, and original interviews with public health leaders reveals that football stadiums in small to medium-sized college towns, often distant from hub cities, are among the ideal targets for bioterrorism attacks. Such an attack could have devastating consequences similar to those following Hurricane Katrina. This paper assesses Athens, Georgia, using it as an example for comparable communities across the nation. Based on statistical data from the United States Department of Health and Human Services, Athens-Clarke County (ACC) regularly lacks adequate medical resources and personnel. Following a game day "BioKatrina" attack, the United States Department of Homeland Security estimates that 70 percent of stadium-goers will need medical treatment – 64,922 for Sanford Stadium. Such a strike would drastically overwhelm ACC's healthcare resources. In the event a contagious or extremely virulent bioweapon is used, it will be incumbent upon ACC leaders to contain and facilitate treating every potential victim. Moreover, physicians nationwide are unprepared to diagnose and treat bioterrorism victims without additional training. In order to expedite the clinical management of a stadium attack, Athens' leaders must do more than rely on mutual aid agreements. Printing evacuation routes on ticket stubs and fortifying potential treatment will create more organization within the healthcare response. Furthermore, every ACC official should be familiarized with the biological agent used, likely smallpox or anthrax, and its required treatment through Continuing Medical Education (CME) programs and other required educational curricula. The federal government should fund committees in

all communities like Athens to develop tailored curricula for these sessions. Enacting these measures will tremendously increase confidence and response capability at both the site of disaster and treatment facilities.

### **Construction of Plasmids for Deletion of the Polyphosphate Kinase Gene in *Mycobacterium tuberculosis***

Neel N. Shah

Dr. Russell Karls, Department of Infectious Diseases, University of Georgia

The causative agent of tuberculosis, *Mycobacterium tuberculosis*, exists in the latent phase in over one-third of the world's population. Annually, 8-10 million people suffer from the active disease leading to 2-3 million deaths. *In vitro*, *M. tuberculosis* can enter an antibiotic-resistant state of dormancy. Individuals cured of active TB disease typically remain latently infected and carry a 10% lifetime risk of reactivation of TB. Although the source of energy that this pathogen uses to emerge from latency is unknown, polyphosphates (polymers of high energy phosphate units) may be the source. To investigate whether polyphosphates participate in *M. tuberculosis* dormancy, we are constructing plasmid-based systems that will facilitate deletion of the *ppk* gene encoding polyphosphate kinase in this pathogen. Approximately 500 bp of chromosomal DNA on each side of *ppk* were obtained by PCR and cloned adjacently onto an *E. coli* plasmid to create a deletion cassette. These 500 bp flanking regions are required to direct homologous recombination/deletion of the *ppk* gene upon introduction of the recombinant plasmid into *M. tuberculosis*. Various derivatives of the deletion cassette plasmid have been created to help overcome the low homologous recombination frequency. Progress toward the construction of these plasmids will be presented along with a model for how these plasmids can be used to delete the *ppk* gene in *M. tuberculosis*.

### **Development of Leptin Resistance through High-fructose Diet**

Christopher S. Sharp

Dr. Ruth Harris, Department of Food & Nutrition, University of Georgia

Over 60% of the American adult population is overweight or obese, with obesity becoming a critical health problem. Some studies have demonstrated a possible link between the consumption of high fructose corn syrup and obesity. Between 1970 and 1990 the consumption of corn syrup increased 1000%. The hormone leptin has been shown to inhibit food intake and increase energy expenditure in rodents and humans resulting in weight loss. It accomplishes this inhibition by signaling the hypothalamus, an area of the brain involved in food intake regulation, to change the expression of peptides known to regulate food intake and energy expenditure. Leptin must cross the blood-brain barrier to enter the hypothalamus; however, this transport can be inhibited by high concentrations of triglycerides in the blood. Studies have shown that diets high in fructose raise triglyceride concentrations; therefore we tested whether a high fructose diet could inhibit leptin function in rodents. In this study Sprague Dawley rats were fed either a 60% kcal high fructose diet or a control fructose free diet. After three weeks post-prandial serum triglycerides were approximately 175% those of the controls. The rats were infused with 60 µg/day rat leptin for two weeks. Leptin decreased body fat in the control rats but not those fed the high fructose diet. This experiment shows that high fructose diets impair leptin function, suggesting that the increase in consumption of high fructose corn syrup can potentially cause leptin resistance by raising serum triglycerides and thus may contribute to development of obesity.

### **Short-term Storage of MDBK Cells**

Karin K. Sheehan

Dr. Jeremiah Saliki, Athens Diagnostic Laboratory, University of Georgia

Research involving the use of mammalian cell lines faces the difficulty of storing and preparing

cell cultures for experiments. Cell lines can be stored indefinitely in liquid nitrogen (-197°C), but must be properly thawed, grown, and trypsinized before use for research and diagnostic tests. The need for fresh cells results in high costs that would be reduced if cell suspensions could be stored over a period of days and remain viable for tests. For this study, Madin Darby Bovine Kidney cells (MDBKs) were stored for up to eight days in refrigerator temperature to determine if they maintained their sensitivity to bovine viral diarrhea virus (BVDV) infection. Twenty-four flasks of MDBKs were trypsinized and the cell suspension from each flask divided into nine aliquots. The aliquots were stored at 4°C, and one set of 24 suspensions was used each day for cell counting, titration of BVDV, and the serum neutralization test. Over the nine days (0 to 8), there were significant differences between cell counts but not virus titers or antibody titers. Days 0 and 1 had higher counts than Days 5-8, and Day 2 had a higher count than Days 6-8, with a statistical level of significance of 0.05. These findings suggest that MDBK cell suspensions can be stored at 4°C for a period of nine days and maintain their sensitivity to BVDV infection. These conditions are easy to maintain in a laboratory and can increase efficiency of maintaining cell lines by decreasing the costs of storage.

**The Interaction between Culture, Poverty, and Educational Achievement: How Policy Can Better Impact the Graduation Rates of Georgia's Latino and African American Youth**

Nari Shin, Celina Correa & Yuliya Kuzovkova – ROOSEVELT @ UGA  
Dr. Larry Nackerud, School of Social Work, University of Georgia

The population of Georgia consists of various cultures, economic standings, and education levels. Research and statistical data show Latinos and African Americans in the state of Georgia consistently with a lower high school graduation rate. Georgia's Latino and African American populations have poverty rates that

are higher compared to Caucasians. The factors of cultural background and economic standings are significant contributing variables. Decreased earnings are one of the important negative results on the adult lives for these youth groups. Analysis of data accessed from Emory University, the U.S. Census Bureau, and the Georgia Department of Education reveals the positive and powerful correlation between educational progression and economic standing among Latinos and African Americans. The purpose of this paper is to help understand the interaction of the complex variables of culture and economic standing affecting Latino and African American youths' educational progression. In order to combat this issue, various policies after investigation show positive results, such as the membership in the MSAN, the Minority Student Achievement Network, as well as Charter school options, and governmental aide through certain welfare programs. Another effective economic policy is the "Robin Hood Act" used in Texas to distribute equal state and local funds to school districts. Also, an increase in the federal budget for the study of national dropout rates will develop even more effective policies. These policies will help the development and execution of effective educational policies to decrease dropout rates for the Latino and African American students in the state of Georgia.

**Determining Appropriate Social Assistance Models for Children Living in Communities Affected by HIV/AIDS in Sub-Saharan Africa**

Helen C. Smith  
Dr. Christopher Allen, Department of International Affairs, University of Georgia

The HIV/AIDS epidemic is particularly harsh in sub-Saharan Africa, where approximately 25.4 percent of people are infected with the virus. Children are often the most affected by the epidemic, frequently losing family members and access to resources early on. Appropriate policy responses to protect children from the shocks of HIV/AIDS have developed slowly, but the epidemic's scale requires comprehensive

solutions to strengthen communities and prevent new infections. A fundamental question is how resources should be disbursed in order to build the capacity and capital of households and communities in order to benefit vulnerable children. Currently, however, there are no comparative studies of social protection models that focus on children in communities affected by HIV/AIDS. This paper addresses some of these gaps through comparing targeted but unconditional payments, targeted and conditional transfers, cash for work programs and in-kind transfers. Case studies in South Africa were analyzed to see how well each performs as a family- and community-centered approach that is universal in its treatment of children, has long-term development potential, can be sustained by the government, and does minimal harm with regards to established community safety nets. The paper found that unconditional cash transfer payments offer the most potential, but more robust evaluation of current programs is needed.

### **The CO-H2 Variation in Translucent Clouds at Small Scales**

Myra J. Stone

Dr. Loris Magnani, Department of Physics & Astronomy, University of Georgia

It is important to study interstellar molecular clouds, the sites of all galactic star formation, in order to understand the evolution of our galaxy. Because most of our knowledge of molecular clouds is tied to a determination of their mass, it is of fundamental importance to develop methods which lead to accurate mass estimates. One method is to calibrate the CO – H<sub>2</sub> conversion factor known as X(CO). X(CO) is defined as the molecular hydrogen column density divided by the CO(1-0) velocity-integrated antenna temperature. There is a relationship between the integrated antenna temperature of CH and the amount of molecular hydrogen in a cloud which, in turn, can yield X(CO). It is via this CH-H<sub>2</sub> relationship that we have re-examined the three interstellar molecular clouds MBM03, MBM16, and MBM40 in order to calculate how X(CO) varies over the clouds

on scales of two arcminutes. Previous analyses measured changes on scales of nine arcminutes, so our objective is to explore variations in X(CO) at smaller scales. We present the analysis of new data taken at the Arecibo radiotelescope of MBM40, MBM16, and MBM03.

### **Characterization of the *vgat* Expression Pattern in the Developing Mouse Brain**

Ryan J. Summers, CURO SCHOLAR

Dr. Brian Condie, Department of Genetics, University of Georgia

GABA ( $\gamma$ -aminobutyric acid) is the primary inhibitory neurotransmitter in the mammalian nervous system. The vesicular GABA transporter (VGAT or VIAAT) is a key component in the release of GABA as a neurotransmitter in the mammalian nervous system. It is responsible for loading GABA into synaptic vesicles for release at the neuronal synapse. Until now, the expression pattern of the *vgat* gene in the developing mouse brain had not been characterized. In order to address this question mouse brains at incremental stages from embryonic day 14.5 to embryonic day 17.5 were examined for *vgat* expression. This procedure was accomplished using a mouse line containing an insertion of the *lacZ* reporter gene into the *vgat* coding sequence. Visualization of the reporter gene expression has enabled characterization of the expression pattern of *vgat* in the mouse brain over the course of development. The results obtained indicate that *vgat* is expressed in regions previously identified as containing GABAergic neurons, including the striatum, ganglionic eminence, and cortex. These data indicate that *vgat* is a marker for GABAergic neurons. This characterization of the *vgat* expression pattern over the course of development has expanded our knowledge of the GABA neurotransmitter pathway. The data obtained shows where GABAergic neurons are located spatially as well as what neural circuits they are interacting with at different developmental stages; this information is crucial to understanding the role of GABAergic neurons in brain development.

### **Calcium-independent Phospholipase A<sub>2</sub> Are Novel Targets for Inhibition of Prostate Cancer Cell Growth**

Sonia Talathi – CURO APPRENTICE & CURO SUMMER RESEARCH FELLOW

Dr. Brian S. Cummings, Department of Pharmaceutical & Biomedical Sciences, University of Georgia

Current treatments for prostate cancer include cisplatin and vincristine. Although these chemotherapeutics are somewhat effective, current strategies have focused on combinatorial dosing. This study tested the ability of the Ca<sup>2+</sup>-independent phospholipase A<sub>2</sub> (iPLA<sub>2</sub>) inhibitor bromonenol lactone (BEL) to alter cell growth and death of human prostate cancer cell cultures (PC-3) in combination with commonly used chemotherapeutics cisplatin (0-50 μM) and vincristine (0-2 μM). Exposure of PC-3 cells to cisplatin for 48 hours resulted in concentration-dependent decreases in growth with an IC<sub>50</sub> of 25 μM. Exposure of cells to BEL prior to cisplatin treatment lowered the IC<sub>50</sub> to 6.25 μM. Similar results were seen for vincristine. These data suggested that treatment of cells with BEL potentiated the ability of cisplatin and vincristine to decrease cell growth. To study the mechanisms involved in this process, the effect of BEL, in the presence and absence of chemotherapeutics, on cell cycle and annexin and PI binding was studied. Exposure of cells to BEL increased the amount of cells in G<sub>1</sub> while decreasing the amount of cells in S-Phase. Incubation with cisplatin or vincristine induced a G<sub>2</sub>-M arrest. However, pretreatment with BEL inhibited this arrest and increased the amount of cells in G<sub>1</sub> and sub-G<sub>1</sub>. These data suggest that iPLA<sub>2</sub> inhibition decreases cell growth by decreasing the progression of cells from the G<sub>1</sub> to the S-phase of the cell cycle, that the effect of iPLA<sub>2</sub> inhibitors and chemotherapeutics on cancer cell growth are additive, and that iPLA<sub>2</sub> is a novel target for the inhibition of cancer cell growth.

### **Gene Expression Profiles of Neuronal Cells Derived from Human Embryonic Stem Cells**

Christine E. Tarleton – CURO APPRENTICE  
Dr. Steven Stice, Department of Animal & Dairy Science, University of Georgia

Human embryonic stem (hES) cells are a potential source for generating large quantities of neuronal cells for use in cell therapy treatments for neurodegenerative diseases such as Parkinson's. A major goal in stem cell research is to fully understand and to reliably and specifically differentiate hES cells into the specific subtypes of neuronal cells. Our lab has derived an intermediate between hES cells and neuronal cells, the neuronal progenitor (NP) cell. NP cells have the ability to become several types of neuronal cells such as neurons, astrocytes, and oligodendrocytes. Although it is currently possible to differentiate neuronal cells from NP cells, this process is not fully understood in part because these cells have not been fully characterized. By isolating mRNA from the cells at different stages of differentiation (hES cells, NP cells, and neuronal cells) and using a low density array to perform simultaneous real-time PCR reactions of 95 genes known to play a role in neuronal development, it may be possible to determine which genes are expressed at each stage of the differentiation process as well as their relative quantification at these stages. Relative quantification will be determined by comparing the expression of the genes known to play a role in neuronal development to a housekeeping gene, a gene that is transcribed at a relatively constant level regardless of experimental conditions. It is our hope that these gene expression profiles will provide insight into the differentiation of hES cells into various neuronal cell types. We expect the derived NP cells to have similar gene expression profiles to neuronal epithelial cells; likewise, we believe that the derived neuronal cells' gene expression profile will be consistent with that of neurons.

### **Peyton Wall's Impact on Racial Relations in 1960s Atlanta, Georgia**

Courtney M. Thomas – CURO APPRENTICE  
Dr. Barbara McCaskill, Department of English,  
University of Georgia

In the 1960s, the city of Atlanta, Georgia was a booming metropolis that constantly added new businesses and residents. Americans considered Atlanta “The City too Busy to Hate,” since many of the city’s public and private areas were desegregated. However, much racial segregation existed among residential areas. One such neighborhood was Peyton Forest, an all-white subdivision located in southwest Atlanta. In the fall of 1962, the subdivision’s developer grew dissatisfied with the rate of development and threatened to start selling homes in Peyton Forest to African Americans, since many blacks were currently moving into adjoining neighborhoods. Enraged by his threat, the white homeowners of Peyton Forest formed the Southwest Citizens Association, whose purpose was to maintain the neighborhood’s racial homogeneity. Ivan Allen, Atlanta’s mayor at the time, decided to stop the panic of these white homeowners by designating an area of unused commercial land to the north of Peyton Forest as a place to house low-to-middle income African Americans. On December 17, 1962, Mayor Allen further met the desires of Peyton Forest’s white homeowners when he signed a proposal to build a 2-foot, 10-inch-high, steel and wood barrier that separated Peyton Forest from Collier Heights, a middle-class African American neighborhood. My presentation focuses on Peyton Wall’s impact on Atlanta’s reputation as a racially progressive city during the 1960s. I will also discuss how Peyton Wall and other racial buffers led to “white flight” in the city and the racial disparities between metro and suburban Atlanta that currently exist.

### **A Study of Site Formation Processes for the Northwestern Hawaiian Islands**

Lindsey Thomas, CURO SCHOLAR  
Dr. Ervan Garrison, Department of  
Anthropology, University of Georgia

The Northwestern Hawaiian Islands is the most remote archipelago of distant atolls in the world. Despite their small size, these islands have harbored shipwrecks for hundreds of years. Site formation process is the study of how a ship goes from being a highly organized machine whose purpose is to stay afloat to a scatter of artifacts on the bottom of the ocean. Every environment and type of ship undergoes a different site formation process. Site formation process is crucial to understanding the archaeological site, and can help archaeologists determine the path that a ship took as it wrecked. This is an ongoing study aimed at determining the unique characteristics of a wooden shipwreck in the Northwestern Hawaiian Islands. This paper is based on fieldwork conducted during a 2006 NOAA Hollings Program scholarship and research conducted through University of Georgia CURO Independent Research courses. The scholarship allowed the author to join the annual field research cruise to the Northwestern Hawaiian Islands on board the NOAA ship *Hi'ialakai*. To develop/apply a site formation theory to any particular region, it is necessary to use information about both the environmental conditions of the area and information about shipwrecks themselves. Information about environmental conditions in the Northwestern Hawaiian Islands was obtained from oceanographers that study the region, and the historical information about four shipwrecks (the *Pearl*, the *Parker*, and the USS *Saginaw*, and an unidentified fishing vessel) was obtained through fieldwork conducted by the author. Each site was mapped in as much detail as possible, and by combining this information with historical details about the shipwrecks and information about the environment, it was possible to gain a better understanding of site formation processes for wooden shipwrecks in the Northwestern Hawaiian Islands.

### ***The Caddo Bateau***

Lindsey Thomas, CURO SCHOLAR  
Prof. R. G. Brown, Departments of Sculpture  
and Studio Foundations, University of Georgia



I am not an artist in the traditional sense. I study Maritime Archaeology, which could be considered a different type of art. The construction of the Caddo Bateau, a flat bottom fishing boat from Lake Caddo in Texas, was built so that I could gain a better understanding of small boat construction. This process will help me analyze future archaeological sites with a better understanding of the subject matter. The Caddo Bateau that is currently under construction will likely be built of cypress and mulberry, though that is dependent upon the availability of materials. The first step in constructing the boat was to draw the plans. Those plans were then converted into a scale model. The fifteen-foot boat was shrunk down to a thirty-inch cypress model. This model was built as a way to prepare for the construction of the larger boat and to work out any issues with the directions in advance. The Caddo Bateau was chosen as the type of boat to be built

because it was small enough and simple enough to be feasible for a first-time boat builder to complete, while still offering several characteristics found in larger boats, such as plank construction and supporting knees. Ideally, by the end of construction I will be able to analyze shipwreck sites with a builder's eye rather than just a student's.

### **The Analysis of Synthetic Neoglycolipids by FTICR Tandem Mass Spectrometry**

Laura A. Thornsberry  
Dr. Jon Amster, Department of Chemistry,  
University of Georgia

Synthetic neoglycolipids are used as stabilizing agents in cationic liposomes, which are one of the most important nonviral gene carriers used in cancer gene therapy. A series of synthetic neoglycolipids, consisting of a sugar linked to a steroid by a polyethylene glycol (PEG) chain, were analyzed using Fourier Transform Ion Cyclotron Resonance mass spectrometry. Recently, synthetic neoglycolipids were observed to form a unique product ion, called the [C-glycoside]<sup>+</sup>, as the result of the excision of the PEG chain from the molecule. The purpose of this work is to confirm the structure of this novel product by tandem mass spectrometry, as well as study the conditions in which it is formed. Mass spectra of the samples were acquired in positive and negative ion modes, and collisionally assisted dissociation and infrared multiphoton dissociation were used to further fragment the ions. Initial fragmentation of the protonated species of the synthetic neoglycolipid samples resulted in the formation of the [C-glycoside]<sup>+</sup> product ion. Further fragmentation of the [C-glycoside]<sup>+</sup> resulted in two peaks, which were assigned as the sugar and the steroid, thereby confirming the *in situ* formation of this ion-molecule product. In many cases, substantial amounts of formic acid were used to strengthen the intensity of the [M+H]<sup>+</sup> peak. Some neoglycolipids were only observed as [M+Na]<sup>+</sup>, due to their inherent acidity, and did not form the [C-glycoside]<sup>+</sup> product. The samples were also studied under negative ion mode, however, the novel product

did not occur under these conditions. The presence of acetylated groups on the sugar moiety of the molecule also proved unsuccessful in the generation of the novel product ion.

### **Glycosyl Composition Analysis of *Rhizobium leguminosarum* 3841 Bacteroids**

Prince Tiekou

Dr. Russell Carlson, Department of Biochemistry & Molecular Biology, University of Georgia

The legume-nodulating bacterium, *Rhizobium leguminosarum*, forms symbiosis with leguminous plants while other bacteria can not co-exist with these plants. Once inside the root cortical cells, the bacteria's surface membrane differentiates morphologically and functionally yielding bacteroids; the active form of the bacteria which carry out nitrogen fixation. The aim of this project was to study the biochemistry of the bacteroid surface lipopolysaccharides. Pea plants were infected with the *Rhizobium* and the bacteroids were isolated. The bacteroid lipopolysaccharides (LPSs) were extracted by a phenol-water method, and analyzed by polyacrylamide gel electrophoresis in deoxycholate (DOC-PAGE). DOC-PAGE revealed that a majority of the bacteroid LPS was recovered in the phenol layer. In contrast, free-living forms of the bacteria yielded LPS that partition primarily into the water layer. The extracts were analyzed by preparing TMS-methyl glycoside and alditol acetate derivatives with GC-mass spectrometry analysis. The phenol layer extract contained unusual, endogenously methylated glycosyl residues, having a higher degree of methylation than those derived from free-living Rhizobial LPS. These results indicated that the bacteroid LPS are altered compared to LPS from the free-living *Rhizobia*, indicating a shift toward greater hydrophobicity for the bacteroid LPS. These changes may contribute to long term bacteroid survival within the plant cell. This project seeks to further understand the molecular basis of the many stages of symbiotic infection. This in turn can result in the development (through molecular biological construction) of improved

strains of *Rhizobia* that can broaden their host-range specificity, increase their competitiveness, and thus maximize legume growth rates and yields.

### **Trade for Humanity: A Proposal for Viet Nam**

Anh V. Trieu & Ashley Bowen – ROOSEVELT @ UGA

Dr. Maurits Van der Veen, Department of International Affairs, University of Georgia

Despite pressure from the United Nations and the constraints of international law, the Vietnamese government continues to deny its citizens basic political freedoms. Fundamental rights like freedom of speech, press, and religion are routinely restricted in Viet Nam, which blatantly violates the United Nations' Universal Declaration of Human Rights. The United States, Viet Nam's largest trade partner with 21.2 percent of Viet Nam's trade activity, normalized trade with Viet Nam in 2006. The United States is in a unique position to create incentives for the Vietnamese government to improve its substandard human rights record. The United States, using reports from international human rights organizations, should prepare a series of human rights goals that Viet Nam must implement. For each year that goals are met, the United States would decrease tariffs on imported goods from Viet Nam by a percent. Offering phased incentives, a continued decrease in tariffs for each year, the policy should produce measurable improvement in Vietnamese human rights without the stigma and backlash of applying direct pressure. The incentive system would penalize Viet Nam for human rights violations and reward good behavior with increased participation in the global market. This policy would further the United States' commitment to promoting democracy and freedom in southeast Asia.

### **Genetic Systems for the Elimination of Polyphosphate Synthesis in *Mycobacterium avium* Subspecies *paratuberculosis***

Blake M. Troiani, CURO SCHOLAR  
Dr. Russell Karls and Dr. Frederick Quinn,  
Department of Infectious Diseases, University of Georgia

*Mycobacterium avium* subspecies *paratuberculosis* (*M.a.p.*), a slow-growing pathogen of ruminants and the cause of Johne's disease, colonizes the distal ileum of the small intestines. As antimycobacterial treatment for *M.a.p.* infection is not feasible, a live-attenuated vaccine strain of *M.a.p.* may provide a better solution to Johne's disease. The goal of this research is to explore a new avenue for the creation of a suitable vaccine strain of *M.a.p.* Previous research has implicated the polyphosphate kinase gene (*ppk*) as essential to the survival of *Salmonella enterica* in acidic environments. Because *M.a.p.* similarly endures typically lethal pH environments and contains a putative *ppk* region, it is hypothesized that *ppk* serves an equivalent purpose in *M.a.p.* A *ppk* deletion mutant will be created by homologous recombination. Regions adjacent to *ppk* on the *M.a.p.* chromosome will be amplified by polymerase chain reaction (PCR) and cloned adjoining one another on an *E. coli* plasmid. Genes necessary to facilitate the isolation and screening of deletion candidates will subsequently be incorporated into the plasmids. The newly created vectors will serve as a suicide delivery vector for facilitating the deletion of *ppk* in *M.a.p.* via homologous-recombination mediated replacement of *ppk*. If the mutation causes the expected effect, diminished growth should be observed in situations that mimic the low pH *M.a.p.* would encounter in infection conditions.

### **An Affect Control Model of Attribution**

Traci N. Tucker  
Dr. Dawn Robinson, Department of Sociology,  
University of Georgia

Past research has suggested that attributions are made on the basis of perception; however, more

recent research suggests that attributions are generated when a conclusion is inconsistent with an individual's expectation. This study aims to answer the question of what drives individuals to make different types of attributions and how those attributions can be predicted for in any given situation. Two experiments examined the relationship between attribution and deflection, where deflection is conceptually defined as how unlikely a particular occurrence is, to see if high deflection rates would predict situational attributions and vice versa. Study 1 made use of self report data to assess the attribution outcomes of high and low self-esteem individuals when they were presented with either positive or negative feedback themselves. Study 2 then used computer simulations to calculate the expected deflection for the events of study 1. Results indicated that high deflection rates do indeed lead to situational attributions while low deflection rates lead to dispositional attributions.

### **Parasite Strain-dependent Variation in CD8+ T Cell Responses Is a General Characteristic of Experimental *Trypanosoma cruzi* Infection**

Jake E. Turrentine, CURO SCHOLAR  
Dr. Rick L. Tarleton, Department of Cellular Biology, University of Georgia

The genome of *Trypanosoma cruzi*, the causative agent of Chagas' disease, contains a large number of *trans*-sialidase (*ts*) genes that encode for peptides recognized by CD8<sup>+</sup> T cells in mice and humans. In previous studies, experimental infection of C57BL/6 mice yielded dominant CD8<sup>+</sup> T cell responses against *ts* peptides TSKB20 and TSKB18. However, the kinetics and magnitude of the *ts*-specific CD8<sup>+</sup> T cell responses varied depending on the infecting parasite strain. The studies presented here sought to determine whether parasite strain-dependent differences in *ts*-specific CD8<sup>+</sup> T cell responses are a general phenomenon of experimental infection. Therefore, Balb/c mice were infected with different strains of *T. cruzi* (Brazil, CL or Y strain), and CD8<sup>+</sup> T cell responses to the previously identified *ts* epitope TSKD14 were

examined. CD8<sup>+</sup> T cells from Brazil-infected mice produced the pro-inflammatory cytokine IFN-gamma at higher frequencies following TSKD14 stimulation than did CD8<sup>+</sup> T cells from mice infected with CL strain. However, TSKD14-specific CD8<sup>+</sup> T cell responses were observed earlier following CL infection than following Brazil infection. TSKD14-specific recall responses were considerably lower from splenocytes of Y strain-infected mice. *In vivo* cytotoxic activity against TSKD14-pulsed cells also varied in mice infected with different parasite strains. Thus, as predicted, the kinetics and magnitude of TSKD14-specific immune responses show parasite strain-dependent variation in Balb/c mice. These results suggest that infection of humans by different strains may lead to substantially different immune responses and could contribute to different disease outcomes.

### **The Role of CD8<sup>+</sup> T Cell Responses to Immunodominant Trans-sialidase Epitopes in Control of Experimental *Trypanosoma cruzi* Infection**

Jake E. Turrentine, CURO SCHOLAR  
Dr. Rick L. Tarleton, Department of Cellular Biology, University of Georgia

*Trypanosoma cruzi*, the causative agent of Chagas' disease, afflicts approximately 18 million people in Central and South America. In both humans and mice, the CD8<sup>+</sup> T cell response is critical for management of *T. cruzi* infection. Depletion of CD8<sup>+</sup> T cells during infection leads to elevated parasitemia, and mice deficient in CD8<sup>+</sup> T cells are unable to control the infection. In *T. cruzi* infection of Balb/C mice, dominant CD8<sup>+</sup> T cell responses against a single *trans*-sialidase (ts)-derived peptide (TSKD14) have been identified. This study examines the role of TSKD14-specific CD8<sup>+</sup> T cell responses in the control of *T. cruzi* infection. To this end, mice vaccinated to induce potent TSKD14-specific CD8<sup>+</sup> T cell responses, or tolerized to prevent the induction of TSKD14-specific responses during infection, have been generated. These mice will be challenge infected with *T. cruzi*, and the ability to control the infection will be

determined. We predict that vaccination to induce TSKD14-specific responses will protect mice from lethal infection and that tolerization of this response will make mice highly susceptible to challenge infection. The possibility that responses to alternative ts or non-ts epitopes may be able to compensate for the absence of the dominant CD8<sup>+</sup> T cell response against TSKD14 will also be investigated. Results from these experiments will reveal the importance of the ts-specific CD8<sup>+</sup> T cell response and will provide guidance for the formulation of vaccines for *T. cruzi* infection.

### **The Effect of Women as Candidates in Congressional Campaigns**

Anna Tyler

Dr. Ruthann Lariscy, Department of Advertising & Public Relations, University of Georgia

Each election cycle, more women are elected into the US House and Senate. Women are also increasing their numbers in leadership roles within the political sphere and constantly expanding opportunities for future generations of women in politics. The fight to be elected to a national office is one that women of all ages, races and beliefs have struggled with for decades. Six races for the House of Representatives were examined during the 2006 Election Cycle in order to shed light on the dynamics of campaigns in relation to gender. The races were broken into three subgroups: two races featuring men only, two races featuring men and women, and two races in which just women ran. The data are drawn from a variety of local and national news publications from across the country as well as several previously conducted research studies on women and political campaigns. Previous studies suggest support for the idea that women who assume offensive positions in policy areas that are considered traditionally male receive increased support and higher approval ratings. However, gender was shown to have no real effect on negativity or attack ads during the campaigns. Rather, as more and more women enter politics at the national level, races are focusing less on gender and more on other aspects of the

candidate's life such as their party affiliation and previous political experience. This expansion of women into the political arena creates a new and exciting dynamic, especially as the playing fields appear to level and gender is taken out of the equation, by opening the door to more viewpoints and a variety of backgrounds and opinions.

### **Music and Identity among Mexican Immigrants in Atlanta, 1985-2006**

Karen C. Usselman

Dr. Pamela Voekel, Department of History,  
University of Georgia

Mexican immigrants to the United States have used music to cope with the struggles of living in a new society, to maintain a connection with their homeland, and to create unified immigrant enclaves for as long as the border between the two countries has existed. But just as trends in immigration fluctuated, so too have the styles, content, and popularity of music in immigrant communities. Studying the changes in the music of Mexican immigrants reveals varying degrees of cultural mixing and assimilation, evolving economic and social struggles, attempts at establishing a cohesive immigrant community, and even the development of a new Mexican-American identity. The city of Atlanta, with its exploding Mexican immigrant population, vibrant musical tradition, and historically active minority population, provides a unique and relatively unstudied locale for exploring the effects of music on Mexican immigrant identities in a rapidly globalizing society. My three primary methods of conducting such research are to examine the styles and content of popular song lyrics from the late 1980's onward, to read the Atlanta newspaper *Mundo Hispánico* from the same period, and to interview music industry professionals in Atlanta, such as record store owners and radio station managers, about the evolution of Mexican music and changes in the listening audience. This approach reveals a multi-faceted and dynamic Mexican-American identity, rooted in a sense of shared history and developed through shared experiences, that reflects the changes of a globalizing culture.

### ***Chicken Water, What Are We?, and We Are Nothing But the Scraps***

Kacie Versaci

Prof. Judith Ortiz Cofer, Department of English,  
University of Georgia

I began writing as soon as I could form words on pages, transferring images from my brain to the paper. Time has brought me to the ripe old age of 20, where I have been finding many more outlets for my writing than just journals and private scribbling. In the spring of my sophomore year of college, my writing focused on poetry and prose-poetry, then shifted the fall of my junior year to more essays and creative non-fiction. I am at a phase now where I am experimenting with ruination, by blending other works into new poems and crossing genre lines to create new media. I am also working on a series of short, creative non-fiction pieces about various relationships in my life and experimenting with different forms of stream-of-consciousness fiction. I draw a great deal of influence from Judith Budnitz, trying to blend imaginative story telling with fresher takes on prose. My current area of study is magazine journalism, so more of my writing style is drawn from the writing skills learned in that field.

### **The Effectiveness of Teaching Expressive Arts Activities Based in the Methods of Art and Drama Therapy to Educators to Improve Student Welfare**

Erika B. Vinson – CURO SUMMER  
RESEARCH FELLOW

Dr. Richard Siegesmund, Department of Art  
Education, University of Georgia

The purpose of this mixed-methods study is to determine the effectiveness of The ArtReach Foundation's Train the Trainers workshops in preparing teachers and community leaders to use art and drama therapy-based activities with their children to help them express themselves. Data were collected through surveys, interviews, follow-up interviews, and visual journals. The participants were Arkansas educators, counselors, and administrators, some of whom have received Gulf Coast evacuees in their

classrooms. Six school counselors, five art instructors, one preschool multicultural specialist, one social worker, one incarcerated-parent educator, and one school administrator completed two surveys. The first survey inquired about the participants' first experience in the five-day workshop in October of 2005 and how it has affected their work with children. The second survey pertained to the second phase of training conducted during a week in June 2006. Eleven counselors and teachers participated in thirty-minute semi-structured interviews. All participants were also provided a visual journal in which to document their personal reflections and reactions to the workshop curriculum by means of text and images (Grauer & Nath, 1998). Starting with the daily goals and objectives used by the ArtReach professionals to organize instruction, the data is thematically reviewed with a focus on discursive, metaphoric, and visual symbolic meaning in the participants' visual journals. Preliminary findings suggest that visual journals aid in sustaining and expanding important metaphors utilized during instruction, help to organize thoughts, and clarify points emphasized during instruction, and show complexity of thought leading to more robust understandings of the participant.

#### **Initial Sequencing and Tissue Distribution of Toll-like Receptor 3 mRNA in White-tailed Deer**

Seychelle M. Vos

Dr. Elizabeth Howerth, Department of Veterinary Pathology, University of Georgia

Hemorrhagic disease is a fatal disease in white-tailed deer (WTD) caused by two closely related double stranded RNA orbiviruses, bluetongue and epizootic hemorrhagic disease.

Susceptibility to these viruses varies among populations of WTD, and results from experimental studies suggest that innate immunity may contribute to these differences. It is hypothesized that the Toll-like receptor 3 (TLR3), an important cell surface receptor in innate immunity that recognizes double stranded RNA (dsRNA), may be involved in differences in innate immunity in WTD populations.

However, little is known about TLRs in WTD, and rudimentary information is needed before the potential effect of TLR3s on disease susceptibility can be evaluated. Therefore, the objectives of this study were to perform initial sequencing and determine tissue distribution of the mRNA of TLR3 in normal WTD. A 209bp portion of WTD TLR3 mRNA was sequenced using primers designed originally for the TLR3 in cattle. Primers were then designed specifically for deer using the newly sequenced fragment. A northern blot was performed to confirm that the sequenced mRNA fragment was the TLR3 receptor. Quantitative analysis of TLR3 mRNA in various WTD tissues from non-infected WTD was performed using real time-polymerase chain reaction (RT-PCR). The results suggest that the TLR3 is expressed in skin, small intestine, brain, lung, and spleen tissues at levels that may prove useful in future research. These initial results will allow further investigation into the overall significance of the TLR3 in variation of susceptibility to disease among WTD populations.

#### **Identification of L-PHA Reactive Glycoproteins from Invasive Breast Carcinoma Tissue: Potential Biomarkers for Early Detection**

Rachelle W. Wallace, CURO SCHOLAR

Dr. Michael Pierce, Department of Biochemistry & Molecular Biology, University of Georgia

There is an urgent need for the research and development of biomarkers for breast cancer to aid in diagnosis. The focus of this project is the use of new glycoproteomic techniques to discover biomarkers for breast cancer. Glycoproteomics will allow the identification of specific glycoproteins that have been reported to contain an identified carbohydrate structure attached to an asparagine residue on glycoproteins known as the  $\beta$  (1,6) N-linked glycan. The presence of this glycan is altered throughout the progression of breast carcinoma. Recent studies have found that the lectin L-PHA binds to and enriches for glycoproteins expressing the  $\beta$  (1,6) N-linked glycan, which is present on glycoproteins expressed in breast

carcinoma, but is absent in non-diseased tissue. The goal of this study was to detect the glycoproteins that contain the  $\beta$  (1,6) N-linked glycan in the tissue of patients with breast carcinoma. The binding of this lectin indicates the expression of the  $\beta$  (1,6) N-linked glycan. Analysis of the tissue was performed by means of lectin-affinity chromatography and liquid chromatography/mass spectrometry in order to identify glycoproteins or glycopeptides that show this specific  $\beta$  (1,6) N-linked glycan in breast carcinoma and to show the ability of this lectin L-PHA to enrich for these proteins. Several glycoproteins identified as a result of L-PHA enrichment have been previously linked to cancer in recent literature, specifically within the TGF- $\beta$  signaling pathway. With further research, one of these identified proteins could potentially become a biomarker for breast cancer diagnosis.

### **The Price of Victory: Influences on the Conduct of War**

Joshua J. Watkins – CURO SUMMER RESEARCH FELLOW, CURO SCHOLAR  
Dr. Patricia Lynne Sullivan, Department of International Affairs, University of Georgia

The deployment of military forces abroad is one of the most difficult and profound decisions national leaders face because of the daunting task of determining the potential human and material costs of attaining a state's political objectives. But there have been no attempts to collect systematic data on leaders' pre-war expectations about the duration, casualty rates, or troop and resource requirements of military operations. In addition, extant literature does not explore the connection between leaders' pre-war expectations and public support for sustaining military operations once they are underway. I used military records, government documents, archival material, newspaper articles, secondary historical accounts, and chronologies of international events to collect data on both anticipated and actual troop deployments, conflict escalation, casualty rates, assistance from allies, and public support for sustaining British, French, and U.S. military interventions since World War II. My research suggests that

leaders' pre-war expectations are often misguided and, in some cases, completely wrong. I also found that public support for sustaining military operations tends to decrease over the course of a conflict, although not as dramatically as previous case studies would cause one to believe. Levels of support vary according to the objectives of a military intervention, the human cost, and public perceptions of progress. This research provides insight regarding the ability of nations to bear the costs of future conflicts.

### **Sexual Orientation as a Diffuse Status Characteristic: The Effects of Sexual Orientation on Expectations in Interaction**

Alexander W. Watts – CURO SCHOLAR  
Dr. Dawn Robinson, Department of Sociology, University of Georgia

Status characteristics theory attempts to model how groups working together to complete a task act according to a shared hierarchy of expectations based on group members' expectations for each other's competency. This hierarchy is based on group members' characteristics that are both unrelated (diffuse status characteristics) and immediately related (specific status characteristics) to the task at hand. Despite the wealth of literature providing evidence for gender, age, and occupation operating as diffuse status characteristics, no experimental research has tested the operation of sexual orientation as a diffuse status characteristic, though the implications of discovering the effects of sexual orientation are profound. For example, what effect does the perception of a jury member's sexual orientation have on the rest of the jury's tendency to value his/her input? Would a heterosexual U.S. soldier be less likely to obey the commands of an openly gay officer? In this paper, I provide evidence for the need to empirically test the effects of sexual orientation on expectations in interaction through an experimental design. I find that survey data, past research, and theoretical reasoning illustrate that sexual orientation likely influences expectations in task settings. Furthermore, based on survey data and

the results of a computer simulation of affect control theory, I provide evidence that the effects of sexual orientation on the group's shared hierarchy of expectations are conditional upon the gender of the group members. Last, I will make more general conclusions about the real-world and theoretical implications of my findings and suggestions for future research.

**The Legacy of AQ Khan: An Analysis of Illicit Trade Patterns in the Pre-enlargement European Union since the Exposure of the Khan Network and Recommendations for Preventing Future Catastrophe**

Daniel Weitz – CURO SUMMER RESEARCH FELLOW & ROOSEVELT @ UGA  
Dr. Gary Bertsch, Center for International Trade & Security, University of Georgia

Illicit trade of items that pose severe threats to international security has surfaced noticeably in recent years. The ever-increasing volume of global trade, the availability of assorted dangerous goods on the open market, and circumvention of international trade law have created an ideal environment for traffickers to procure and supply illicit goods. Consequently, illicit trafficking has become a subject of much international concern amongst academics, policymakers, and government officials alike. The term illicit trade encompasses numerous aspects of unlawful trafficking, including the types of goods being trafficked, the countries used as points of transit, and other variables. This paper focuses specifically on the trafficking of nuclear dual-use goods, defined as equipment and technologies with legitimate civilian and non-military uses that are exploitable for the construction of nuclear weapons. This topic is of critical importance because illicit transfers of nuclear dual-use items have already contributed to at least one nation's procurement of nuclear weapons, and future nuclear weapons developments by such means remains largely open unless effective measures are taken to deter proliferators. This paper seeks to analyze existing trends in the trafficking of nuclear dual-use equipment and technology throughout the pre-enlargement European Union since the 2003

procurement of nuclear weapons by the Pakistani national Abdul Qadeer Khan's illicit trafficking network. Through the creation of a database documenting cases of illicit trade based upon extensive open source research, this paper will offer an intensive analysis of trafficking trends in the countries most heavily linked to illicit trade. Furthermore, this paper will analyze the export and border controls of these countries and offer policy recommendations based on perceived deficiencies with the hope of curbing means of illicit trade currently available to traffickers.

**The Effect of Age on Subject Doubling in French**

Melissa E. Whatley  
Dr. Diana Ranson, Department of Romance Languages, University of Georgia

Native speakers of French often produce utterances, such as “la grammaire c'est difficile”, which exhibit Subject Doubling (SD), a noun, which alone could serve as a subject and a corresponding subject pronoun. While most examples of SD serve a pragmatic function, such as topic identification or comparison, others appear to serve no function. This fact has led several researchers to propose that the subject pronoun in spoken French is agglutinating to the verb, and that eventually every verb will be preceded by a pronoun despite its pragmatic function. The finding that younger speakers produce more SD than their older counterparts would support this hypothesis. This study is based on an aural analysis of 1,390 utterances with noun subjects in spontaneous conversations with 32 native speakers of French, recorded in Southern France in 2005 and 2006. The 16 younger speakers, 24 to 40 years old, produced a slightly higher percentage of SD than their 16 older counterparts, 43 to 78 years old (40% vs. 33%). These speakers also produced more pronouns lacking pragmatic functions (29 examples or 10% of the total number of pronouns) than the older speakers who produced only 16 such pronouns (8%). This 2% difference is not statistically significant. Even though younger speakers produced a higher percentage

of utterances with SD and a higher percentage of doubled pronouns with no pragmatic function, the finding that 63% of the utterances with noun subjects in the corpus do not exhibit subject doubling argues against the hypothesis that the subject pronoun is agglutinating to the verb. According to this research, French is not changing in this aspect of its verbal morphology.

### **Investigation of the Horizontal Transfer of Virulence Factors of *Staphylococcus aureus* between Humans and Companion Animals**

Brooke L. Wheeler

Dr. Susan Sanchez, Athens Diagnostic Laboratory, University of Georgia

*Staphylococcus aureus* is part of human's transient microflora, found on approximately 20% of people at any time, occasionally causing opportunistic infection. Methicillin resistant *Staphylococcus aureus*, MRSA, emerged following the introduction of antibiotics to healthcare. Previously there has been a distinction between "hospital acquired" MRSA with resistance to multiple antibiotics and a "community acquired" MRSA that seemed unrelated to the healthcare settings, had fewer resistances, and sometimes had a leukocidin toxin that was especially virulent. A major concern is that companion animals are also reservoirs of the organism suggesting a greater potential of transmission. These animals have been insinuated as the sources of strains causing infections in their owners. To test the prediction that the MRSA strains found on companion animals are actually different from the ones that cause infections in humans, samples were taken from canines at the small animal teaching hospital. These were tested by PCR, all confirmed *mecA* positive, which shows the organism carries antibiotic resistance, and *nucA*, which is specific to *Staphylococcus aureus*. The positive samples were then tested by PCR for superantigens including SEA-SEE, SEG-SEJ, ETA, ETB and TSST-1. The strains were also typed and found to be genetically similar to the human strains USA900 and USA100, one seemingly identical to USA300. Though the strains found on humans and non-human

animals came from a common original strain, the difference in the virulence factors found in the human versus the companion animal strain suggest that animals are being wrongfully blamed as the infection source.

### **Mothers' Parenting Styles and Their Toddlers' Compliance**

Lionel (Leo) White

Dr. Hui-Chin Hsu, Department of Child & Family Development, University of Georgia

During the second year of life, toddlers develop their first sense of autonomy. Due to this dramatic change and the resulting difficult interactions with parents, this age period is typically referred as the "Terrible Twos." Parents may use different strategies to deal with their two year olds' misbehaviors. Within a larger longitudinal study from infancy to early childhood, an experiment of "Toys on Shelf" was designed to target toddlers' compliance following maternal orders. Children were instructed not to play with toys on the shelf by their mothers. The social interaction between a total of 73 two-and-a half-year-olds and their mothers were observed and videotaped. Previous research showed that young children's compliant behavior is related to their motivation to learn (Kochanska, Tjebkes, Forman 1998). This study will focus on the examination of whether and how mothers' parenting styles relate to different degrees of compliance with the child. The observation of child compliance, which varies from committed compliance (full endorsement of maternal agenda), to situational compliance (compliance is sustained by continuous maternal prompting), passive noncompliance (child ignores maternal directives without overt negativity), overt resistance (refusal or negotiation of maternal agenda), and to defiance (overt rejection of maternal agenda), is based on the system developed by Kochanska et al (1998). It is expected that maternal guidance (e.g. request, reason, positive evaluation, verbal/nonverbal empathy) contributes to toddlers' committed compliance, whereas maternal control (which includes negation, power assertion, reprimand, and bargaining)

contributes to the children's overt resistance and defiance. The detailed results and implications of mother-child interaction on the emotional development of the toddler will be discussed at the conference.

**Investigation of State-controlled Media Outlets and Their Reports on Internal Conflict: A Xinjiang Province Case Study**

Ashley A. Wilkinson

Dr. Stephen Shellman, Department of International Affairs, University of Georgia

My research concerns how state-run media depict internal conflict to the outside world, and whether foreign media report the situation differently or merely repeat the state-run media's viewpoint. In researching state-owned media reports of conflict I will perform a quantitative case study of the media coverage of the Xinjiang province of China. This study will consist of developing a scheme to codify the frequency, scope, magnitude, and political slant of several newspapers' coverage of the conflict in the Xinjiang province between Uighur nationalists and the Chinese government. I will code the frequency of reports and the frequency of particular terms used across different media sources, and I will code how the coverage differs in scope and magnitude, and how media sources on the left and right cover the conflict. Since the Chinese established the northwest territory known as the Xinjiang province, the native ethnic Uighurs have believed that the Chinese Han majority has infiltrated and repressed their culture. While some Uighur groups have tried to re-establish their sovereignty through protests, other groups such as the East Turkestan Liberation Front have gone as far as bombing buildings. China has taken a strong stance against Uighur nationalism, and since the Chinese government has great influence over its newspapers, I hypothesize that the Chinese media have an anti-Uighur bias. I also hypothesize that many Western papers have used state-run media sources in their reports without using other sources, and thus may be promulgating Chinese government opinions. This project is part of a growing body of

research on both the influence of state-run media bias and the conflict in the Xinjiang province. I hope that this study contributes to future research on these topics.

**The Broken Bridge: Discovering Why Alpha-Dystroglycan Loses Its Function**

Jasmine D. Williams – CURO SCHOLAR

Dr. Lance Wells, Department of Biochemistry & Molecular Biology, University of Georgia

Alpha-Dystroglycan (aDG) is a protein heavily glycosylated with N and O-linked sugar molecules that plays a key role in the function of muscles and neurons. Together with other proteins in a multiprotein complex, aDG establishes a necessary connection between the cytoskeleton within the cell and the extracellular matrix. Improper glycosylation of aDG has been associated with metastasis in certain cancers and genetic defects in the enzymes that add a particular type of glycosylation, known as O-mannosylation, to aDG result in improper function of the protein and congenital muscular dystrophy. The severity of the hypoglycosylation correlates with the severity of the resulting disease. The purpose of this project is to identify the key residues that cause aDG to lose its function. Chinese Hamster ovary (CHO) cells will be used to express the protein for these experiments since several existing CHO cell lines have known defects in specific glycosylation pathways. An epitope-tagged aDG expression plasmid and transient transfection conditions have been generated. We are currently in the process of purifying the wildtype protein taking advantage of the epitope tag and will be monitoring purification via Western blotting and silver staining of SDS-PAGE gels. Purified protein will be assessed for function via binding to laminin using surface plasmon resonance. Future work will focus on analyzing site-directed mutants of aDG that are defective in glycosylation as well as expressing the wildtype protein in CHO cells that are defective in specific glycosylation pathways. By doing so, we expect to discover the key residues and glycosylation types that are essential for proper

aDG function. This research is supported by the Muscular Dystrophy Association.

### **Titanium Carbide Nanocrystals: A Storage Medium for the Coming Hydrogen Economy?**

Kathryn E. Williamson

Dr. Steven Lewis, Department of Physics & Astronomy, University of Georgia

As energy consumption continues to rise, the need for an alternative fuel supply has become ever more prevalent. The hydrogen economy offers great potential as the next source of energy delivery. Hydrogen is nonpolluting and abundant; however, more research needs to be done in the technology of production, storage, and use. Our research focuses on the storage issue. Nanocrystals are good candidates for hydrogen storage due to their high surface to volume ratios. Hydrogen atoms could be stored by binding to the surface or within the interiors of nanocrystals, and could later be extracted for use. We have concentrated on the class of nanocrystals called metal carbides, specifically titanium carbide. Titanium is a lightweight metal and, when compounded with carbon, the structure offers several good candidate sites for binding hydrogen. We have treated interatomic interactions quantum mechanically to understand accurately how hydrogen interacts with the titanium carbide nanocrystal and where it is likely to bind. This has been done using the Vienna Ab-initio Simulation Package (VASP), which is a robust, widely used program for solving the quantum mechanical equations numerically on supercomputers. These simulations reveal detailed microscopic information about the electronic structure and bonding energetics of the hydrogen/titanium carbide system. By comparing results for different configurations, we have determined likely locations for atomic and molecular hydrogen to bind and the strengths of these binding interactions.

### **Political and Social Foundations for Environmental Sustainability**

Karen C. Wong

Dr. Andrew Whitford, Department of Public Administration & Policy, University of Georgia

Environmental sustainability is the long-term preservation of our environment for the future. The purpose of our essay is to quantitatively investigate several possible foundations for environmental sustainability, as measured across countries with varying geography, development patterns, social customs, and political arrangements. We first test two central hypotheses about the roles of democracy and federalism. Our study asks if democracy increases environmental sustainability and if federalism reduces sustainability. We also assess the roles of organized groups representing different kinds of environmental interests, development paths, and religious orientations. To measure sustainability, we use three measures of sustainability (environmental systems, environmental stresses, and human vulnerability) from the 2002 Environmental Sustainability Index (ESI). We find little evidence for variation in sustainability levels given variation in either democracy or federalism. However, we find that the effect of economic development (both current and historical) depends on the measurement of sustainability. Stress and vulnerability are affected by business practices and international environmental organizations (but environmental systems are not), and the effect of Protestant religious affiliations depends on our measurement of sustainability. Although these findings show no clear political foundation, they portray a complex and varied set of foundations for environmental sustainability.

### ***Poppy Reliquaries and Tissue Ring***

Laura Wood

Prof. Rob Jackson and Prof. Mary Hallam  
Pearse, Department of Jewelry & Metalwork,  
University of Georgia



My recent works reflect themes of memory and preciousness. Containment of the memory is a way for me to exemplify the importance of the object within. I pull inspiration for my work largely from my surroundings. *Poppy Reliquaries* were inspired by the poppy plant that grows throughout Italy. While living in Tuscany over the summer of 2006 I noticed the life cycle of these plants. While the plants were alive they were bright blooms and as they began to die their brightness would subside and they would eventually lose their petals, stiffen and turn beautiful colors of brown. The fragile poppies would remain until the weather took its toll. I wanted to give these plants a home for which I could protect and cherish them. The

poppies remain a lasting memory of Italy. *Tissue Ring* also alludes to a memory. This piece was created to embody the characteristics of my mother and grandmother who often carried tissues on hand. The tissues were used for anything from blotting lips to blowing noses. I chose to honor this childhood memory. The tissue housed inside this piece evokes the memory and the ring is a means to contain a precious moment in time.

### **Molecular Regulation of Parathyroid Organogenesis in the Mouse**

Shannon F. Yu – CURO SUMMER

RESEARCH FELLOW, CURO SCHOLAR

Dr. Nancy R. Manley, Department of Genetics,  
University of Georgia

In mice, the parathyroid and thymus glands develop from shared primordia that form from the third pharyngeal pouch. The parathyroid glands are the most important endocrine regulator in maintaining calcium homeostasis in order to achieve the proper functioning of the nervous and muscular systems. At E 11.5, the parathyroid and thymus are morphologically indistinguishable, but can be marked with two organ-specific transcription factors: *Gcm2* and *Foxn1*, respectively. Consistent with its expression pattern, *Gcm2*<sup>-/-</sup> mutant mice are aparathyroid. Analysis of the third pouch-derived primordium in *Gcm2*<sup>-/-</sup> mutants showed that the parathyroid gland was present prior to E12.5 and was lost due to apoptosis between E12-12.5. Additional gene marker analysis excluded the possibility that *Gcm2* is required for pouch patterning or for the establishment of the parathyroid domain, but did find evidence for a requirement for *Gcm2* in differentiation and subsequent survival of parathyroid cells. Previous research from our lab has implicated *Shh* in the regulation of *Gcm2*, which is undetectable in *Shh*<sup>-/-</sup> mutant mice. Changes in the expression of *Gcm2* suggest that a *Shh* gradient is responsible for establishing the location of *Gcm2* expression. *In situ* hybridization analysis of the *Shh*<sup>flx/flx</sup> allele, which exhibits a reduced range of diffusion, did not reveal any phenotypic change at E11.5, and

demonstrated *PTH* expression at E12.5, indicating normal parathyroid differentiation. Analysis of the *ShhN* allele, which demonstrates an extended range of diffusion, revealed concurrent expansion of *Gcm2* and *Tbx1* expression, supporting a role for Shh in regulating parathyroid organogenesis. Thus, the data support our model in which Shh regulates *Gcm2* expression in a concentration-dependent manner.

### **The Effects of Colostral Leukocytes on TNF $\alpha$ Levels in Neonatal Calves**

Leilah D. Zahedi – CURO APPRENTICE  
Dr. David Hurley, Department of Large Animal Medicine, University of Georgia

Colostrum, the “first milk” produced by all mammals, contains many immunological components, including immunoglobulin, cytokines, and maternal leukocytes that help protect the neonate in the first days after birth. Tumor necrosis factor alpha (TNF $\alpha$ ) is a cytokine associated with immune function and an activator of inflammatory responses in the body. It is not clear, however, how colostrum leukocytes affect TNF $\alpha$  levels in the neonate. The purpose of this project is to determine the effects of maternal cells in colostrum on serum concentrations of TNF $\alpha$  in neonatal calves. Calves were fed either whole colostrum (C), frozen colostrum (FC), or cell-free colostrum (CFC) within 6 hours of birth. Blood samples were collected before the calves were fed colostrum, 1 day, 2 days, and 7 days after feeding. TNF $\alpha$  levels were measured using a TNF $\alpha$  specific ELISA assay, and samples were compared to a standard curve using recombinant bovine TNF $\alpha$  protein. Preliminary results indicate that at birth all calves have levels of TNF $\alpha$  below 2 ng/mL. At 24 hours, the calves receiving CFC had the highest level of circulating TNF $\alpha$  (mean 29 ng/mL), the calves receiving FC had moderate TNF $\alpha$  concentrations (mean 16 ng/mL) and the calves receiving C had the lowest TNF $\alpha$  concentrations (mean 12 ng/mL). By 48 hours, serum concentrations of TNF $\alpha$  were similar in all groups (mean 13 ng/mL). The results for

samples collected 7 days after feeding are being determined. These results are consistent with the concept that transfer of maternal leukocytes reduces early inflammatory activation in the neonate.

### **Lectin Histochemistry of Cell-surface Glycoproteins of the Non-pathogenic Ciliate *Tetrahymena thermophila* and the Pathogenic Ciliate *Ichthyophthirius multifiliis***

Jessica Zaleon – CURO APPRENTICE  
Dr. Thomas Krunkosky, Department of Veterinary Anatomy & Radiology, University of Georgia

The non-pathogenic ciliated protozoan, *Tetrahymena thermophila*, is a suitable candidate for the expression of heterologous surface proteins from a pathogenic ciliated protozoan, *Ichthyophthirius multifiliis*. *I. multifiliis* expresses abundant membrane proteins known as immobilization antigens, or i-antigens. These proteins elicit an immune response in the infected host and are the focus of vaccine development. *I. multifiliis* theronts and *T. thermophila* cells will be analyzed using a panel of highly purified lectins. These biotinylated proteins bind to cell-surface glycoproteins and will be utilized in immunohistochemical methods to detect them. In addition, cell-surface glycoproteins of *T. thermophila* expressing *I. multifiliis* i-antigens will also be analyzed with these lectins. Of particular interest will be the detection of any differences in the lectin staining as a result of the i-antigen expression in *T. thermophila*. The results of this study will elucidate the effectiveness of utilizing lectin histochemistry as a detector of changes that might occur in the staining pattern of cell-surface carbohydrates when a heterologous surface protein is expressed in a non-pathogenic host. With the findings of this study, the potential effectiveness of *T. thermophila* as a vaccine expression vector will be elucidated.

## Index

### A

Adams, Thomas, 13, 51  
Affolter, James, 9, 39  
Aikens, Laura M., 18, 31  
Alvarado Benitez, Roman, 24, 31  
Allen, Bradley, 11, 73  
Allen, Christopher, 9, 15, 67, 95  
Altizer, Sonia, 19, 21, 22, 39, 69, 89  
Alvarez, Daniel, 10, 21, 64  
Amster, Jon, 12, 99  
Anderson, Alex, 19, 43  
Anderson, Matthew, 14, 46  
Anderson, Wyatt, 10, 19, 21, 37, 64  
Aoki, Kazuhiro, 57  
Arnold, Robert, 16, 89  
Atkins, Jeremy, 12, 66  
Atvur, Alisan J., 14, 32

### B

Bakre, Abhijeet A., 55  
Barber, Crystal, 12, 32  
Barber, Jarrad, 10, 21, 64  
Bar-Peled, Liron, 16, 32  
Bar-Peled, Maor, 16, 50  
Basi, Hariqbal, 14, 33  
Bedell, Mary, 15, 79  
Bentley, Patrick, 15, 53  
Bergmann, Carl, 16, 19, 22, 22, 38, 57, 83,  
84, 86  
Bertsch, Gary, 7, 106  
Beuchat, Larry R., 17, 79  
Bhatt, Shivan P., 18, 33  
Binford, John C., 11, 34  
Birku, Kiya, 13, 18, 34  
Black, Christopher D., 68  
Blount, Ronald, 9, 90  
Bowen, Ashley, 13, 100  
Breevoort, Sarah R., 18, 35  
Brown, Corrie, 7, 21, 68  
Brown, R. G., 25, 99  
Bryant, Jessica M., 15, 35  
Bullock, Charles, 10, 64  
Burch, Ashley C., 19, 36  
Burgamy, Laura, 73  
Burrell, Amy J., 15, 36

### C

Callihan, Charles P., 19, 37  
Campbell, Jerry, 10, 91  
Campbell, W. Keith, 18, 19, 31, 45  
Canady, Colony C., 19, 37  
Carlson, Russell, 23, 100  
Chang, Kevin K., 19, 38  
Chapman, Leah, 73  
Chen, Robert T., 17, 74  
Cheng, Chuan, 19, 38  
Chhabra, Disha, 9, 39  
Chi, Jean, 19, 39  
Chiang, Tsu-Ming, 12, 14, 32, 46  
Chilla, Mark J., 7, 39  
Church, Katherine B., 12, 40  
Clark, Marie Danielle, 73  
Cobb, Benjamin T., 7, 40  
Coffey, Lauren, 7, 19, 41  
Coffield, Julie, 20, 54  
Condie, Brian, 23, 96  
Correa, Celina, 13, 95  
Couppee, Nikki, 24, 41  
Crate, Emily, 73  
Creasy, Rebecca Anne, 15, 42  
Cubañas, Caelin A., 19, 42  
Cummings, Brian S., 17, 19, 23, 44, 97  
Cunningham, Caitlin, 73  
Cunningham, Kimberly B., 19, 43

### D

Darvill, Alan, 12, 16, 70, 77  
Davis, Bryan P., 13, 43  
Davis, Michael W., 11, 43  
DeBray-Pelot, Elizabeth, 12, 66  
De Silva, Dilhara T., 19, 44  
DeDecker, Breonne T., 7, 44  
del Valle, Vanessa N., 19, 45  
Denton, Jeramy, 14, 46  
Dever, William Patrick, 14, 45  
Donovan, Lisa A., 20, 62  
Dore, Timothy, 21, 69  
Douglass, Sara, 14, 46  
Durham, Joseph, 36  
Durso, Andrew M., 11, 19, 46  
Dyer, Jodi L., 10, 47

## Index

### E

Egger, Rachel, 24, 47  
Elder, Christopher P., 68  
Elliott, Madeline C., 17, 20, 48  
Enghauser, Rebecca, 15, 73  
Ervasti, James M., 57  
Esteghamat, Naseem, 13, 75

### F

Fang, Hsuan Ju Susan, 12, 24, 49  
Faust, Christina L., 17, 20, 49  
Fechheimer, Marcus, 19, 42  
Fekadu, Yayne, 16, 20, 50  
Fiddymment, Grant M., 8, 20, 51  
Firew, Zion, 16, 50  
Fisher, Jeffrey, 10, 91  
Fogelson, Sergey V., 8, 51  
Fowler, Laurie, 9, 80  
Fox, Zach, 13, 51  
Furukawa, Ruth, 19, 42

### G

Gaertig, Jacek, 15, 35  
Gahlaut, Seema, 7, 40  
Garrison, Ervan, 11, 98  
Gassama, Mary B., 20, 52  
Gay, Gabrielle D., 20, 52  
Gibson, Leslie, 73  
Gladden, Andrew I., 15, 53  
Glover, Claiborne, 21, 63  
Godbey, Elizabeth A., 13, 53  
Gold, Scott, 12, 22, 84  
Grant, Courtney, 20, 54  
Graves, William, 19, 36  
Griffith, Katie, 18, 54  
Guo, Susan S., 8, 55  
Gutierrez-Sanchez, Gerardo, 57

### H

Hall, Erica M., 9, 55  
Hallam Pearse, Mary, 24, 25, 41, 110

Hammond, Stephanie, 57  
Handy, Adele, 8, 55  
Hankins, Katherine, 9, 88  
Hardman, Comusina Celan, 24, 56  
Harper, Brian L., 12, 57  
Harris, Ruth, 13, 18, 22, 34, 94  
Hashmi, Sana, 16, 20, 57  
Hebbard, Elizabeth K., 17, 58  
Henkel, Paul A., 17, 20, 58  
Herbert, Carol M., 24, 59  
Hester, Cassie L., 24, 60  
Hocking, Christopher, 12, 24, 49  
Hodges, Sojourner, 8, 60  
Hohmann, Andrea G., 10, 77  
Hollibaugh, James, 21, 65  
Holloway, Steven, 9, 88  
Holtzman, Mia, 14, 61  
Hooks, Shelley, 17, 20, 58  
Howell, Matt, 25, 61  
Howerth, Elizabeth, 16, 23, 104  
Hsu, Hui-Chin, 13, 107  
Huang, Annie, 20, 62  
Hubbard, Margaret A., 20, 62  
Hula, Justin L., 21, 63  
Hurley, David, 15, 111  
Hussey, Mike, 12, 57

### I

Inman, Brittney, 14, 63  
Ivey, Jennifer S., 10, 64

### J

Jackson, Rob, 24, 25, 41, 110  
Jeon, Jae W., 10, 21, 64  
Johnson, Heather E., 21, 65  
Johnson, Joseph P., 21, 65  
Johnson, Loch, 11, 93  
Johnson, Sara B., 9, 21, 65  
Jones, Jimari L., 12, 66  
Jones, Kerry, 25, 66  
Jones, LaToya, 12, 32

## ∞ Index ∞

---

### K

Kagel, Martin, 17, 58  
Kanani, Kunal N., 21, 67  
Kaplan, Ray, 20, 52  
Karls, Anna, 21, 65  
Karls, Russell, 7, 8, 22, 91, 94, 101  
Keyes-Blumer, Samantha E., 15, 67  
Killey, John R., 7, 21, 68  
Kim, Yong-Kyu, 19, 21, 37, 64  
King, J. Michelle, 68  
Kisaalita, William, 11, 15, 22, 78, 88  
Kissinger, Jessica C., 9, 55  
Kite, Kimberly, 12, 32  
Kleiber, Pamela, 14, 33  
Kolleda, Natalie D., 21, 69  
Kragor, Christopher H., 21, 69  
Krunkosky, Thomas, 24, 111  
Kuo, Chih-Horng, 55  
Kushner, Sidney, 16, 32  
Kuzovkova, Yuliya, 13, 95

### L

Landau, David, 22, 85  
Langston, Keith, 12, 85  
Lanzilotta, William, 12, 82  
Lariscy, Joseph T., 8, 70  
Lariscy, Ruthann, 23, 102  
Lastrapes, William, 14, 45  
Laughlin, Brian T., 12, 70  
Layman, Lawrence, 22, 80  
Leathers, Chandler, 25, 71  
Lents, Clay, 36  
Levy, Brian, 17, 71  
Lewis, Steven, 24, 109  
Lim, Jae-Min, 57  
Lindell, Robert B., 13, 71  
Lorenzini, Dino, 8, 20, 51  
Lowrance, Sherry, 7, 15, 75, 76

### M

MacLean, Christopher, 14, 72  
Maerz, John, 11, 19, 46  
Magnani, Loris, 23, 96

Mahumud, Aqsa, 13, 21, 72  
Mandawat, Anant, 11, 73  
Manley, Nancy R., 24, 110  
Marshall, Michael, 25, 71  
Marshall, Shanania, 12, 32  
Mattmann, Mary, 15, 73  
McCaskill, Barbara, 9, 98  
McCranie, Toni, 12, 32  
McCray, Dakia, 21, 74  
McCully, Kevin K., 10, 21, 68  
McDowell, Jennifer, 10, 22, 86  
McKown, Andrew C., 17, 74  
McNulty, Tom, 8, 87  
McPherson, Aaron K., 10, 21, 68  
McWhorter, William Colter, 13, 75  
Merkle, Scott, 9, 21, 65  
Miller, Yael, 7, 15, 75, 76  
Mills, Maggie, 11, 76  
Mohnen, Debra, 15, 36  
Moise, Anna M., 10, 77  
Momany, Cory, 16, 87  
Moree, Lamar H., 16, 77  
Morgan, Mia Catherine, 15, 78  
Morgan, Yannick, 7, 78  
Murawski, Alex, 24, 25, 60, 61  
Murray, Melinda B., 17, 79

### N

Nackerud, Larry, 13, 17, 71, 95  
Nagao, John, 22, 79  
Natrajan, Nithya M., 15, 22, 79, 80  
Norman, Joseph, 24, 56  
Nyborg, Jennifer, 16, 82

### O

Oakley, Jesse N., 9, 80  
Oh, Noona, 11, 81  
O'Grady, Cara, 14, 73, 81  
O'Keeffe, Joan, 16, 20, 50  
Okwandu, Ezinne A., 12, 16, 82, 82  
Orellana, Victor M., 22, 83  
Orlemanski, Katie, 11, 83  
Ortiz Cofer, Judith, 14, 14, 63, 103  
Osman, Abdulahi, 7, 78

## ∞ Index ∞

---

Owers, Katharine A., 15, 83

### P

Palmer, Lance, 13, 43  
Patel, Ankita, 14, 46  
Patel, Shreyal C., 22, 84  
Patel, Tulsi, 12, 22, 84  
Pavlic, Ed, 14, 32  
Pearl, Danielle L., 12, 85  
Perlman, Mindy, 57  
Perry, Daniel, 22, 85  
Petrey, Aaron C., 16, 22, 86  
Picchetti, Natalie M., 10, 22, 86  
Pierce, Andrew W., 8, 87  
Pierce, Michael, 11, 17, 23, 73, 104  
Piercy, Richard C., 16, 87  
Plaut, Victoria, 21, 74  
Potter, Walter, 8, 51  
Powers, Emily, 9, 88  
Pride, Jonathan, 76  
Promislow, Daniel, 15, 20, 62, 83  
Puente, Lucas L., 8, 88  
Puett, David J., 13, 75

### Q

Quinn, Frederick, 7, 8, 91, 101

### R

Ranson, Diana, 18, 18, 54, 106  
Rapier, Crystal, 11, 22, 88  
Rarick, Rachel M., 22, 89  
Redden, Mandy, 16, 89  
Reed, Eva Bonney, 9, 90  
Rhodes, Leara, 12, 19, 37, 40  
Rhudy, Patricia Lynn, 25, 91  
Richards, Patricia, 11, 83  
Rivard, Lisa, 10, 91  
Roberts, Susan, 24, 24, 24, 24, 25, 31, 47, 59, 60, 61  
Robinson, Dawn, 10, 11, 14, 81, 101, 105  
Robinson, Gregory, 8, 55  
Rojek, Dean, 10, 92

### S

Saliki, Jeremiah, 23, 94  
Sanchez, Susan, 10, 23, 47, 107  
Sarasvati, Bala, 14, 14, 14, 33, 61, 81  
Sarmiento, Fausto, 13, 21, 72  
Satterfield, Rebecca L., 7, 91  
Saupe, Ted, 25, 91  
Sayama, Aaron M., 13, 92  
Scheer, Stephen, 25, 71  
Scheffel, Kathryn L., 10, 92  
Schiller, David, 8, 60  
Schmidt, Walter K., 18, 18, 33, 35  
Schwanenflugel, Paula, 14, 72  
Scott, Clare H., 22, 93  
Shah, Deep J., 11, 93  
Shah, Neel N., 22, 94  
Sharp, Christopher S., 22, 94  
Sheehan, Karin K., 23, 94  
Shellman, Stephen, 7, 7, 8, 8, 11, 12, 13, 15, 19, 41, 44, 53, 55, 76, 88, 92, 108  
Shin, Nari, 13, 95  
Siegesmund, Richard, 10, 101  
Smith, Geoff, 21, 67  
Smith, Helen C., 9, 93  
Smith, Mary Alice, 20, 52  
Stallknecht, David, 17, 20, 49  
Stice, Steven, 13, 23, 53, 97  
Stone, Myra J., 23, 96  
Sturman, Randy, 11, 43  
Sullivan, Patricia Lynne, 8, 105  
Summers, Ryan J., 23, 96

### T

Talathi, Sonia, 17, 23, 97  
Tarleton, Christine E., 23, 97  
Tarleton, Rick L., 9, 23, 101, 102  
Thomas, Courtney M., 9, 98  
Thomas, Lindsey, 11, 25, 98, 99  
Thornsberry, Laura A., 12, 99  
Tieku, Prince, 23, 100  
Tiemeyer, Michael, 57  
Trieu, Anh V., 13, 100  
Troiani, Blake M., 8, 101  
Trombetta, Andrea, 25, 66  
Tucker, Traci N., 14, 101

## ∞ Index ∞

---

Turci-Escobar, John, 7, 39  
Turrentine, Jake E., 9, 23, 101, 102  
Tyler, Anna, 23, 102

### U

Urbauer, Jeffrey L., 17, 20, 48  
Usselman, Karen C., 9, 103

### V

Van der Veen, Maurits, 13, 100  
Versaci, Kacie, 14, 103  
Vinson, Erika B., 10, 103  
Voekel, Pamela, 9, 103  
Vos, Seychelle M., 16, 23, 104

### W

Wallace, Rachelle W., 17, 23, 104  
Wares, John, 11, 22, 34, 93  
Watkins, Joshua J., 8, 105  
Watts, Alexander W., 10, 105  
Webb, Kelli, 14, 46  
Weitz, Daniel, 7, 106  
Wells, Lance, 13, 16, 18, 20, 23, 34, 57, 108  
Whatley, Melissa E., 18, 106  
Wheeler, Brooke L., 23, 107  
Wheeler, James, 57  
White, Lionel (Leo), 13, 107  
Whitford, Andrew, 8, 109  
Wicker, Louise, 15, 42  
Wilkinson, Ashley A., 12, 108  
Williams, David S., 13, 71  
Williams, Jasmine D., 23, 108  
Williamson, Kathryn E., 24, 109  
Willis, Leigh, 8, 70  
Willis, Judith, 22, 79  
Wong, Karen C., 8, 109  
Wood, Laura, 25, 110  
Wu, Sheng-Cheng, 16, 77

### Y

York, William, 19, 38  
Yu, Shannon F., 24, 110  
Yuh, Sun Koo, 25, 91

### Z

Zahedi, Leilah D., 15, 111  
Zaleon, Jessica, 24, 111

*The Center for Undergraduate Research Opportunities is grateful to the following sponsors for underwriting the 2007 Symposium.*



The University of Georgia

Office of the Vice President for Research



*curo@uga.edu*

*www.uga.edu/honors/curo*

*The CURO 2008 Symposium will be held on April 7, 2008 at the University of Georgia.*